Engineering Report Single-Shell Tank Farms Interim Measures to Limit Infiltration Through the Vadose Zone

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U.S. Department of Energy Contract DE-AC27-99RL14047

EDT/ECN: ECN-656350 UC: 2000
Cost Center: 73500 Charge Code: 113738A020
B&R Code: EW3120000 Total Pages:

Key Words: VADOSE SONE, ENGINEERING REPORT, INTERIM MEASURES, SINGLE-SHEL L TANKS FARMS, TANK FARMS, 200W, 200E

Abstract: Identifies, evaluates and recommends interim measures for reducing or eliminating water sources and preferential pathways within the vadose zone of the single-shell tank farms. Features studied: surface water infiltration and leaking water lines that provide recharge moisture, and wells that could provide pathways for contaminant migration. An extensive data base, maps, recommended mitigations, and rough order of magnitude costs are included.

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MAY 7 2001
DATE:
STA: 15
HANFORD RELEASE
ID: 22

Chris Willingham 5/7/01
Release Approval Date

Release Stamp

Approved For Public Release

RECORD OF REVISION

(1) Document Number: RPP-5002

Page 1

(2) Title: Engineering Report, Single-Shell Tank Farms Interim Measures to Limit Infiltration Through the Vadose Zone

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	(6) Cog. Mgr. Date
1 RS	(7) A) edit of summary and attachments 1, 2, 3.		
	B) revision of ROM cost estimates in attachements		
	C) update of figures showing waterline status ECN-656350	F. J. Anderson See ECN for	AJ Knepp 4-25-01 signatures
0	EDT-625640		

A-7320-005 (10/97)

RPP-5002
Revision 1

Engineering Report Single-Shell Tank Farms Interim Measures to Limit Infiltration Through the Vadose Zone

F. J. Anderson
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Date Published
April 2001

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

CH2MHILL
Hanford Group, Inc.

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Office of River Protection under Contract DE-AC06-99RL14047

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SINGLE-SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

March 2001

Subcontract LMHC 96WO-0006

Prepared by
Fluor Federal Services
Richland, Washington

for
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ACRONYM LISTING

CHG	CH2M HILL Hanford Group, Inc. (formerly Lockheed Martin Hanford Corporation)
CMS	Corrective measures study
ET	Evaporation-transpiration
FFU	Fitness-for-use
IS	Interim Stabilized
LMHC	Lockheed Martin Hanford Company
PITT	Partitioning inter-well tracer testing
PNNL	Pacific Northwest National Laboratory
PW	Potable water
RCRA	Resource Conservation Recovery Act
RCT	Radiological control technician
ROM	Rough order of magnitude
RW	Raw water
SST	Single-shell tank
TPA	Tri-Party Agreement
TSD	Treatment, storage and disposal
WAC	Washington Administrative Code
WDOE	Washington State Department of Ecology
WMA	Waste management area
WMNW	Waste Management Northwest

ENGINEERING REPORT

SINGLE-SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

1.0 INTRODUCTION

This engineering report evaluates the 12 single-shell tank (SST) farms on the Hanford Site for cost-effective means to limit water infiltration through the vadose zone. Water comes from leaking water lines, wells within the SST farm areas, and surface water. The farms are located in the 200-East Area (Farms A, AX, B, BX, BY, and C) and 200-West Area (Farms S, SX, T, TX, TY, and U) (see Figure 1-1). The 149 SSTs on the Hanford Site are hazardous waste management units grouped into the 12 tank farms that contain from 4 to 18 tanks per farm.

Operational activities within the Hanford Site SST farms have contributed to contamination of the soil above, around, and below the SSTs. Studies by Gee et al. (1992, 1994, 1998) and Tyler (1999) show that water added to the soil column contributes to the migration of contamination through the vadose zone into the groundwater. The vadose zone is the soil between the ground surface and groundwater. The effects of surface water and leaking water lines are magnified by the characteristics of local soils. The porous, sandy-gravel soil allows moisture to quickly enter and migrate downward through the vadose zone and into the groundwater. Sandy soils also have an insulating effect so there is minimal upward capillary action. Even when the surface is extremely dry from evaporation, the soil a short distance below the surface may be relatively damp.

All SST farms are grouped in treatment, storage, and disposal (TSD) unit S-2-4. The SST farms are combined into seven waste management areas (WMA) as defined in the *Hanford Federal*

Facility Agreement and Consent Order. The WMAs are: A-AX; C; B-BX-BY; S-SX; T; TX-TY; and U (see Figure 1-2). The SSTs currently operate under interim status, pending closure. The SSTs will be closed as TSD facilities under the *Washington's Hazardous Waste Management Act* and Tri-Party Agreement (TPA) milestone M-45-00.

Following is a description of the magnitude of the problem for the three sections of this report: water lines, wells, and surface water control.

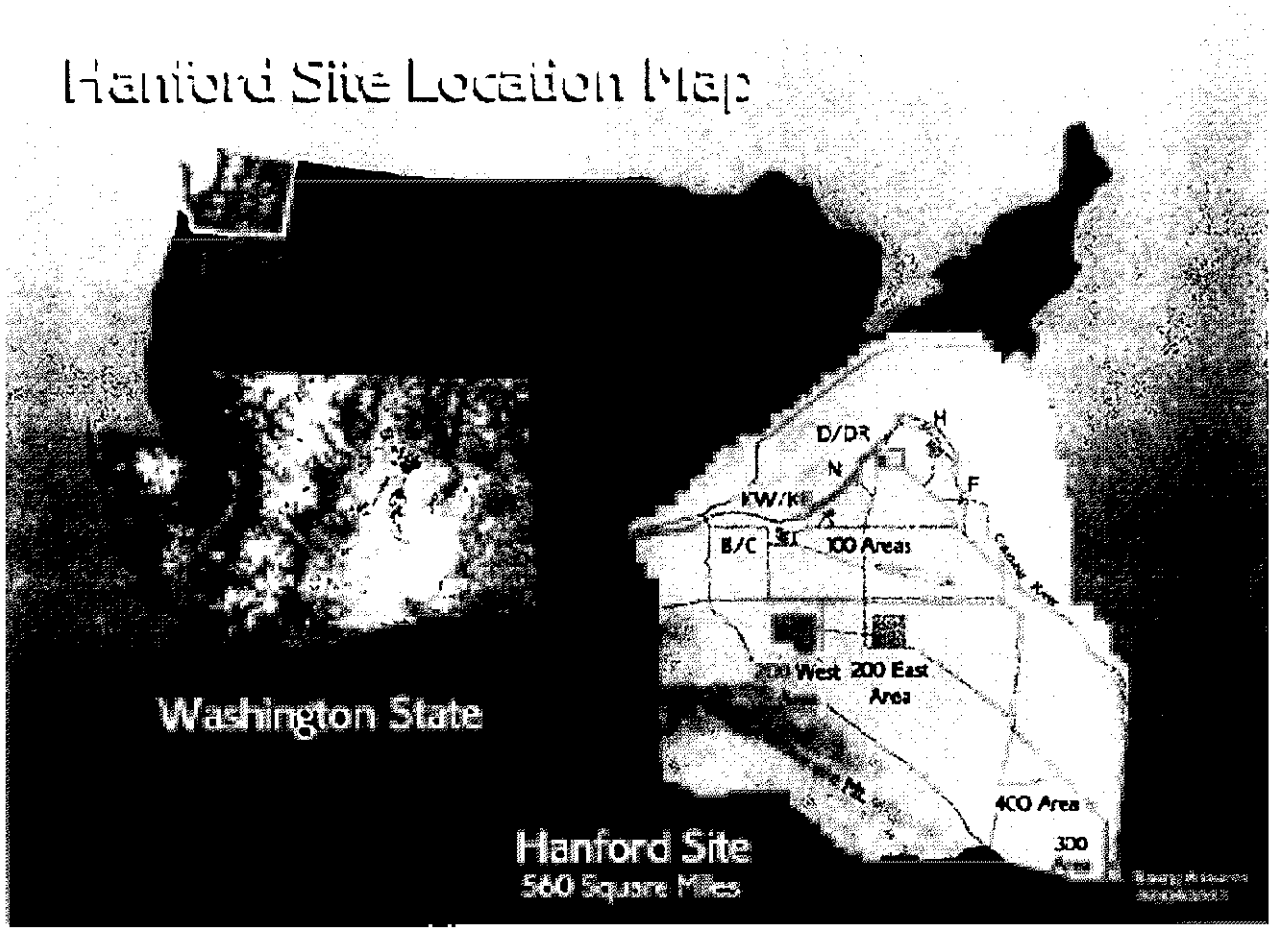
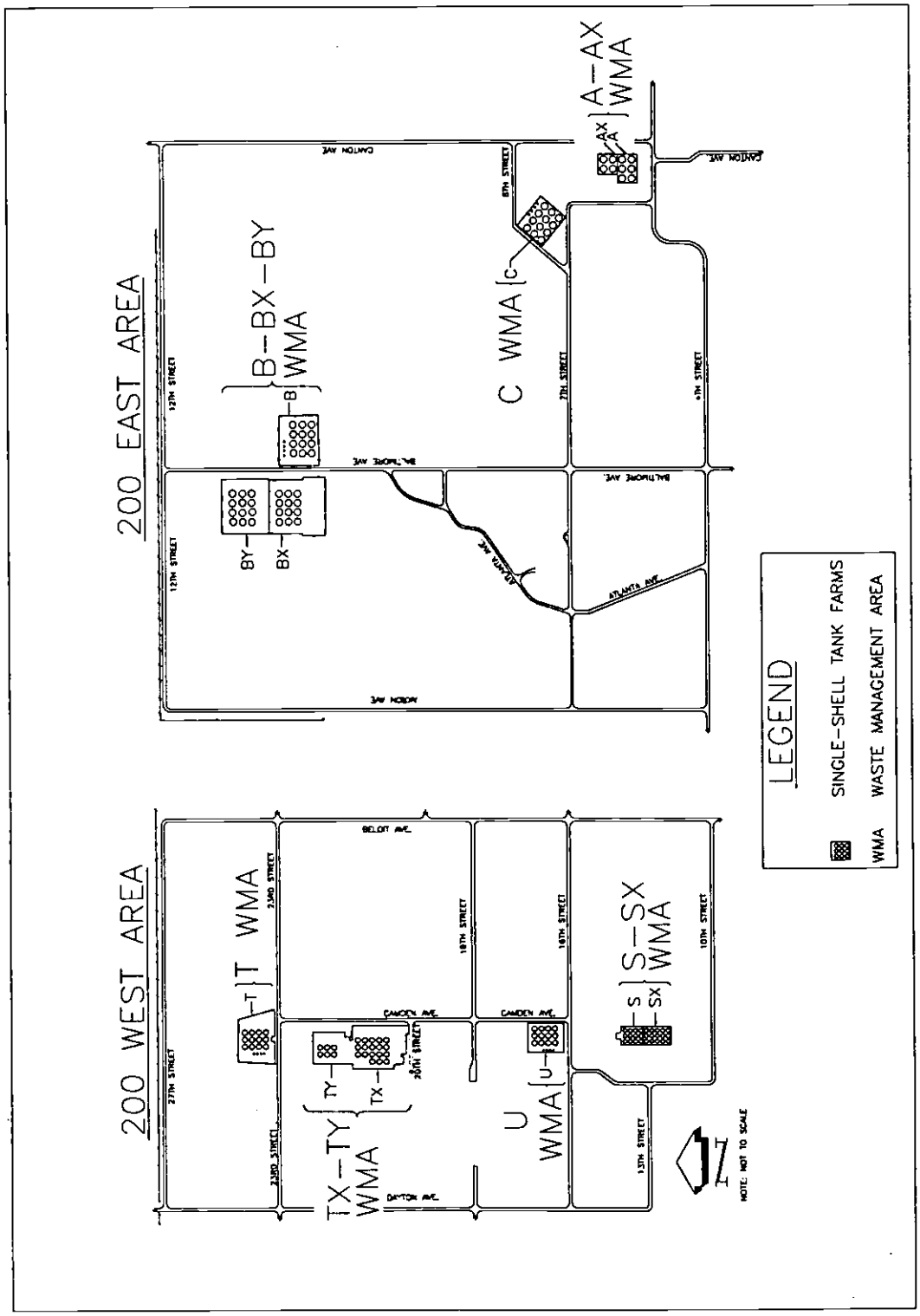


Figure 1-1. **HANFORD SITE LOCATION MAP**

Figure 1-2. Map of Single-Shell Tank Farm Locations and Waste Management Area Boundaries



1.1 WATER LINES

Existing Hanford Site water lines present two separate leak scenarios. The first scenario is everyday leakage from the water lines and the second scenario is leaks from major line ruptures.

The existing water line mains are mostly ductile or cast iron, some with lead joints. Some joints are leaking due to time, soil settlement, deterioration, and operations. The smaller service lines are galvanized steel. Some old galvanized steel water lines are leaking due to corrosion. There have been no leak volume estimates or tests for the tank farm water lines, with the exception of some limited pressure testing performed by tank farm operations. Leak testing on the old export water line system showed an approximate leak rate of 140 gal/min and tests of the 200-West Area water storage reservoir showed a leakage rate, before repairs, of greater than 20,000 gal/day. The majority of the leaks in the water lines are not visible on the surface due to the porous soils, but some water line leaks can be found during the summer by looking for greener vegetation in the vicinity of the water lines.

The second water line leak problem comes from major water line ruptures. According to the water utility purveyor, approximately four major water line breaks a year are expected to occur in the vicinity of the 200-East or 200-West Areas.

1.2 WELLS

The wells are not a direct contributor to vadose zone water contamination; rather they provide a potential preferential pathway for the rapid downward movement of any existing contamination through the vadose zone. The construction of almost all the wells at the SST farms is not in compliance with Washington Administrative Code (WAC) 173-160, *Minimum Standards for Construction and Maintenance of Wells*, which came into existence in 1973. Newly constructed wells are constructed in accordance with WAC 173-160, which establishes minimum construction standards including sealing requirements to prevent water movement between aquifers.

Well casing is normally installed in a borehole that is several inches in diameter larger than the well casing itself. When a well is installed, a narrow zone of permeable soil is created between

the outside of the well casing and the boundary of the soil boring when surrounding soil collapses into the void around the well casing over a period of time. This zone extends from the ground surface to the bottom of the well. Water in the soil can move into this high permeability zone and then rapidly downward.

For Resource Conservation Recovery Act (RCRA)-compliant wells, two steps are taken during well installation to prevent the development of this high permeability zone. A cement cap is placed around the well near the ground surface, and also a cement or low permeability bentonite clay is placed in the void around the well casing at depth. This was not done for most of the SST farm wells, because they were constructed prior to implementation of WAC 173-160. Additionally, in many of the SST farm wells, the casing was perforated and a plug was not installed at the bottom of the well. This situation allows water to move rapidly downward both outside and inside the well.

The depth to groundwater varies between the 200-East and 200-West Areas and between farms. The groundwater depth varies between 50 to 100 m (165 to 325 ft). The wells in the tank farms vary in depth from 25 to 110 m (80 to 350 ft) with the vadose zone wells varying between 25 to 40 m (80 to 130 ft). The groundwater wells provide a direct path to the groundwater. There are 20 groundwater wells in the tank farms. Although the vadose zone wells do not go directly to groundwater, they allow water to move rapidly downward by providing a preferential path along the well casing through a large portion of the vadose zone.

The number of groundwater and vadose zone wells per tank farm determines the magnitude of the problem. There are 847 wells within the limits of the 12 SST farms. Thirteen of these wells were decommissioned in accordance with Washington Administrative Code (WAC) 173-160. There are 20 groundwater wells and 12 vadose wells that have been abandoned in place with unknown closure, included in this total.

1.3 SURFACE WATER

There are two sources of surface water in the SST farms and their effects on the vadose zone can vary dramatically. The first source is normal precipitation (related to annual seasonal precipitation and seasonal evaporation) and the second source would be a catastrophic event.

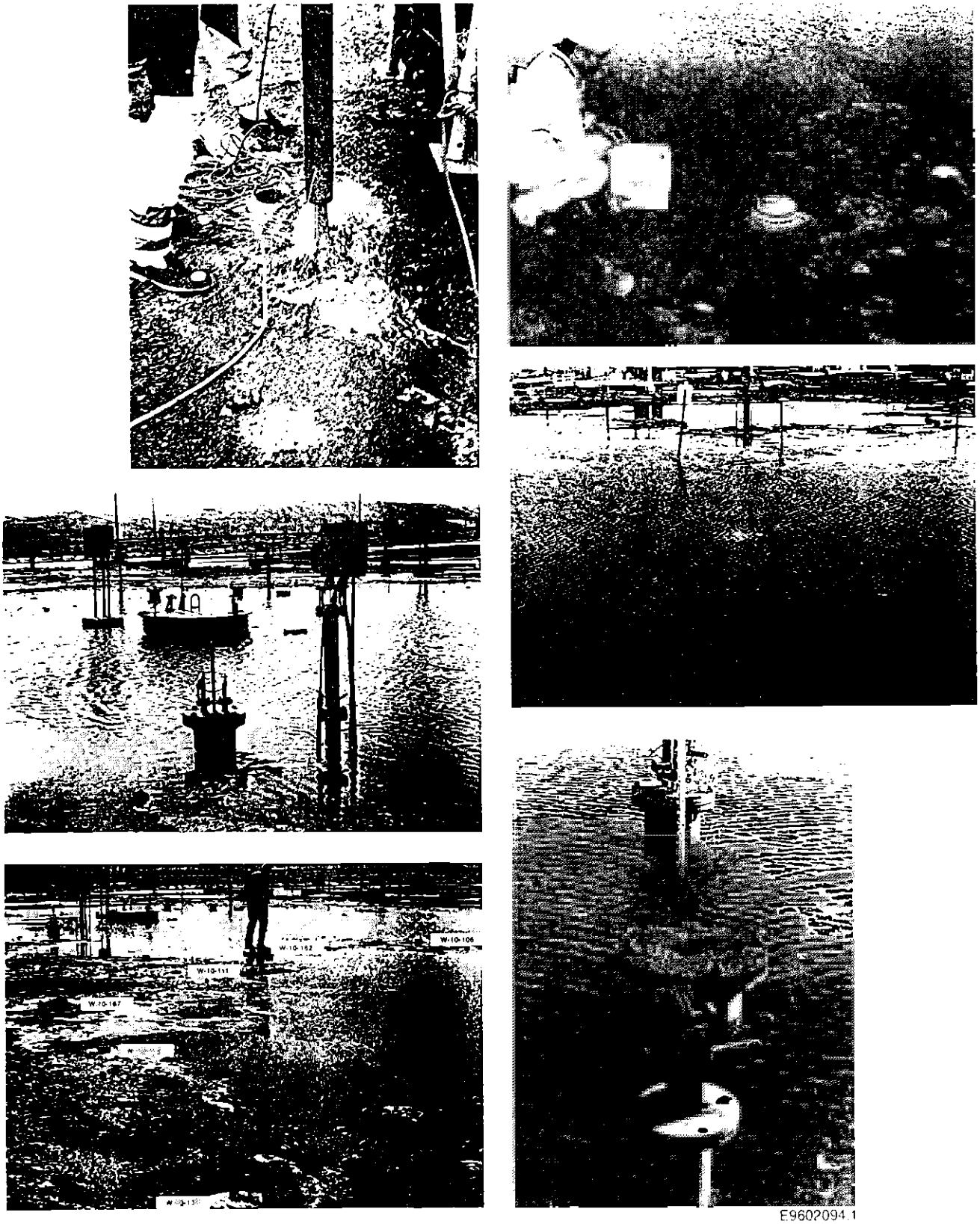
The average annual precipitation at the site is 6.83 inches per year with extremes of 12.31 inches in 1995 and 2.99 inches in 1976. Of these totals, the average precipitation for the months of November, December, and January is 2.85 in. with extremes of a trace to 2.67 in. for November, 0.11 in. to 3.69 in. for December, and 0.08 in. to 2.47 in. for January.

The estimated average evaporation-transpiration (ET) rate for the area is approximately 45 inches per year. Excess moisture occurs primarily because the months when the site is receiving the majority of its precipitation (November, December, and January), are the same months with minimal ET. During an average year, there is excess precipitation of 3/4 inch, and during wetter than normal months and seasons, this excess is even greater. This yearly phenomenon contributes to the continued migration of contamination through the vadose zone.

The second surface water factor considered is catastrophic events. Although catastrophic events occur less frequently, the effects can be significant. In September 1996, a 14-inch water line ruptured in the vicinity of Tank Farms S and SY and within 2 hours, over 550,000 gallons of water spilled onto the ground surface. In a relative short period of time (less than 24 hours), this water had dissipated into the ground.

A catastrophic event could also occur in conjunction with winter seasonal conditions. This would occur when the ground surface is frozen, there is significant snow cover, and a chinook wind causes a rapid snowmelt, thereby flooding the low-lying farms. Photo 1-1 shows an example of this type of event, which occurred at T Farm in February 1979.

Photo 1-1. Flooding at T Farm Due to Rapid Snow-Melt, February 1979.



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2.0 APPROACH/EVALUATION

This engineering report identifies, evaluates, and recommends interim measures for reducing or eliminating water sources and preferential pathways within the vadose zone of the SST farms. Three related SST farm features were studied to determine logical activities to provide interim measures. Surface water infiltration and leaking water lines provide recharge moisture. Wells provide a potential pathway for expediting flow of moisture and contamination into and through the vadose zone and into the groundwater.

This report provides a basis for interim measures to reduce water infiltration into the soil column and, therefore, limit contaminant migration through the vadose zone. The report supports TPA milestone P (M)-45-56-T01, as created by draft change request M-45-98-03.
Three important sources of natural and man-made recharge at the tank farms are:

- Water added through leaking water lines
- Infiltration of surface water caused by precipitation or spills
- Preferential paths provided by the wells within the SST farms.

Each feature was assessed independently to determine possible solutions. Numerous methods were evaluated to reduce the recharge sources or to provide a barrier for the moisture infiltration into the vadose zone (see Attachment I, Water Line Assessment; Attachment II, Well Assessment; and Attachment III, Surface Water Assessment). A detailed discussion of the approach, advantages, disadvantages, and cost are included in each assessment. The boundaries considered for each assessment were as follows:

- Water Line Assessment - area up to 150 m (500 ft) outside the tank farm fence
- Well Assessment – area inside the tank farm fence
- Surface Water Assessment – any areas outside the tank farm fence which, due to slope or surface features, potentially contribute to surface water accumulation inside the tank farm fence.

This report combines and summarizes information from the three assessments and provides recommendations and strategies to substantially reduce water sources and preferential pathways within the vadose zone of the SST farms.

3.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The following summary, conclusions, and recommendations sections pertain to Attachments I, II, and III. Some information presented in Table 3-1 is located in various parts of the Attachments. Specific areas of potential ponding are shown on the tank farm sketches in Attachment III, Appendix D.

Table 3-1.

PONDING/FLOODING AND BARRIER INSTALLATIONS

SST Farm	(Ponding) Closed Depressions	Flooding Due to Pipe Break	Flooding Due to Meteorological Conditions (Rapid Snowmelt)	Regular Ponding due to Rain***	Recommend Run-on Barriers
A	X				X
AX					X
B	X				X
BX	X				X
BY	X	1991**			
C	X				X
S	X	1996***			X
SX	X				X
T	X		1979		X
TX	X				X
TY	X				X
U	X			Nov.-Feb.	X

* Sanitary water line break, RL-WHC-TANKFARM-1991-0175.
** Found in Type C Investigation (flooding occurred in SY Farm also.)
*** Information contained is anecdotal, based on interviews with Site personnel. No documentation is available.

An extensive database was developed for this report that encompasses anecdotal information, historical reports and specifications, drawings, aerial photos, interviews with recognized site experts, and various contractor historical records. Conflicting information retained by the organizations responsible for the elements of this report have been reconciled in this database.

Consequently, this report provides an updated and complete database to support ongoing work and initiate future projects within the SST farms and the immediate surrounding areas.

All selected mitigating measures must comply with Washington State Storm Water Permit ST 4510 for stormwater removal. Permit revision may be required.

3.1 WATER LINE ASSESSMENT STUDY (ATTACHMENT I)

3.1.1 Summary

The study identifies the active and inactive potable water and raw water (PW/RW) lines within and near the SST farm areas. Most of these carbon steel lines were installed during original tank farm construction and are 30 to 50 years old. The original design life of the lines was normally 20 years. The 27 000 m (88,500 ft) of lines vary in diameter from 1/2-to 24-in. Attachment I contains drawings and details of all the SST farm water lines.

The water lines may be active or inactive. Active lines are those lines currently pressurized and in use within or adjacent to a farm. Inactive lines are those that have documentation showing they have been cut and capped. Where documentation could not be found, a water line was assumed to be active.

Currently, there are needs for water in AX, C, BY, S, SX, TX, and U Tank Farms for the interim stabilization program (saltwells program). In the future, water will be required in all farms to support retrieval operations.

All active buried water lines within the SST farm fence should be abandoned due to the risk they present because of age-related deterioration, existing underground leaks, and corrosion. Further justification is the cost and difficulty to repair the lines, potential volume attributed to leaks, reduced need for water in the farms, and the possibility of undetected underground leaks. Photographs 3-1 and 3-2 show typical examples of tuberculation and corrosion damaged water lines within the SST farms. Main lines outside the fence should be cut, capped, and abandoned as far as possible from the SST

farms. This would minimize the risk of leakage into the farms and reduce the risk to the vadose zone.

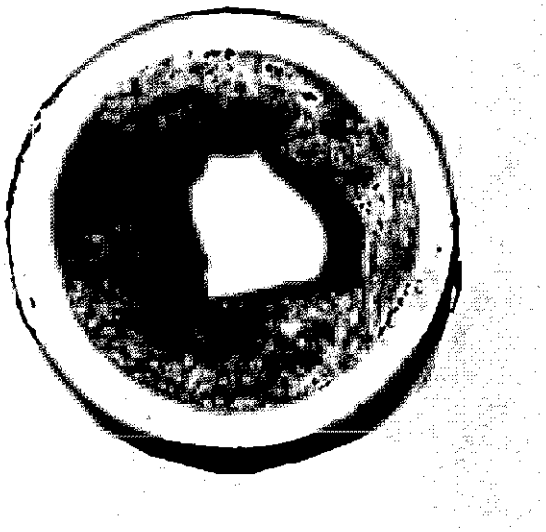

Photo 3-1.

TUBERCULATION BUILDUP INSIDE POTABLE WATER LINE

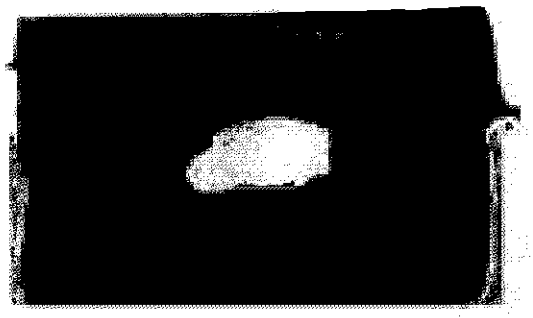

Photo 3-2.

HOLE CORROSION-GALVANIZED WATER LINE

3.1.2 Conclusions

All active water lines inside or near the SST farm fence should be verified in the field. Because of unreliable documentation, the current status of all lines designated as "active" in this study should be confirmed. Locations identified on the drawings in Attachment I should be verified to confirm that all water lines are accounted for and that these lines are active, or the drawings should be corrected to reflect that they are inactive. This verification will establish the baseline for the following actions evaluated in this study:

- No Action (take no further action beyond identifying active and inactive lines).
- Remove all water lines.
- Abandoned all water lines in place.
- Fill abandoned-in-place water lines with grout.

Table 3-2 provides a comparison of advantages and disadvantages of the alternatives, by number. Water line assessment alternative costs are shown in Table 3-3. These tables are also shown in Attachment I. The annual cost of operations and maintenance of the water lines and the cost of tanker trucks to provide water when needed is not included in the costs in Table 3-3. Operations and Maintenance costs will be the same for all alternatives, except Alternative 1 "No Action," and so were not required for the purposes of comparison of alternatives. The number of lines to be maintained is unknown since some or all lines may be abandoned. The duration and schedule for use of tanker trucks is difficult to determine. However, a water source will be required for as long as it takes to complete the waste removal. These costs will need to be addressed after completion of the water line evaluation.

Table 3-2*
WATER LINE ASSESSMENT

Alternative/Cost	Advantages	Disadvantages
1. No Action	Annual operation and maintenance costs are in current budget	Objectives of engineering study and TPA milestone not achieved
Water Line Exploration (identify active and inactive lines) Estimated cost: $195K	Provides required data for alternatives below	Required for Alternatives 2, 3, and 4
	Requires review of water distribution network in SST farms	
2. Remove Water Lines Estimated cost: $62.1M	Eliminates potential source of water to vadose zone	Large contaminated waste volume for disposal
	Objectives of engineering study achieved	Extensive RCT coverage required
	Easy to prioritize work	Long schedule
		May require confined space work
		Labor intensive
3. Water Lines Abandoned in Place Estimated cost: $648K	Objectives of engineering study achieved	Abandoned lines may provide flow path for liquids
	Easy to prioritize work	Water may remain in isolated lines
	Flexible	May require confined space work
	Easy work package preparation	RCT coverage may be required
	Small sections of pipe exposed at any one time	
4. Grout-fill Abandoned Water Lines Estimated cost: $1.20M	Same advantages as Alternative 3	Same disadvantages as Alternative 3
	Provides barrier to any errant liquid flow	Requires removal of residual water in lines
	Liquid pockets removed by grout	Increased labor for equipment and RCT coverage

*This table is duplicated in Attachment I (Table 6-3)

Table 3-3*

WATERLINE ASSESSMENT ALTERNATIVE COSTS
($ x 1000)

Tank Farm	Water Line Exploration ($x1000)	Active Water Lines		Inactive Water Lines		ALT. 2 Remove Pipe ($x1000)	ALT. 3 Cut, Cap, ABD. Pipe ($x1000)	ALT. 4 Grout Pipe ($x1000)
		M	Ft	M	Ft			
A	$ 26	2,289	7,508	1,220	4,002	$ 7,457	$ 88	$ 225
AX	$ 14	2,997	9,833	216	708	$ 6,711	$ 45	$ 76
B	$ 14	1,671	5,481	1,313	4,307	$ 8,078	$ 45	$ 68
BX	$ 14	704	2,309	1,229	4,031	$ 4,101	$ 45	$ 71
BY	$ 14	0	0	1,955	6,412	$ 4,661	$ 45	$ 68
C	$ 14	1,663	5,456	1,186	3,890	$ 4,785	$ 45	$ 68
S	$ 13	590	1,936	1,485	4,872	$ 3,791	$ 45	$ 145
SX	$ 27	0	0	1,585	5,199	$ 3,698	$ 91	$ 166
T	$ 13	0	0	1,162	3,811	$ 2,859	$ 45	$ 64
TX	$ 27	385	1,260	3,366	11,040	$10,191	$ 91	$ 153
TY	$ 5	0	0	740	2,427	$ 2,020	$ 18	$ 35
U	$ 14	448	1,469	949	3,113	$ 3,791	$ 45	$ 61
TOTAL	$195	10,747	35,252	16,406	53,812	$62,143	$648	$1,201

* This table is duplicated in Attachment I (Table 6-4)

3.1.3 Recommendations

The recommended initial action is to conduct an evaluation to determine which lines are active versus inactive. This entails a detailed walkdown of all lines including the lines outside the SST farm fence that are not clearly documented as cut and capped. Based on the rationale discussed in Section 3.1.1, the first recommendation is that all buried water lines within the SST farm fence be removed from service. The preferred method is Alternative 3: cut, cap, and abandon in place all water lines that lead into the farms. This activity would be performed near the supply main, well outside the SST farm fences. As water is needed within the SST farm, it should be supplied by alternate means, including either tank truck or over-ground supply lines. If these supply means are not acceptable, the existing lines must either be replaced or their integrity validated by pressure testing.

The study also evaluated the water lines outside the SST farm limits located within 150 m (500 ft) of a tank farm. The 6700 m (22,000 ft) of water lines located in this outer area are primarily 6-in. and larger main lines. A graded approach is recommended to address the water lines outside the SST farms. An evaluation of all existing main lines should be performed. Lines not required should be removed from service. The integrity of water lines left in service should be evaluated by visual inspections, pressure testing, or other methods. All suspect lines essential for plant operations should be relocated outside the area of influence of the tank farms.

Project W-519 installed approximately 725 m (2,400 ft) of new DN150 (6-in.) pipe with construction completed in April 2000 as part of a system to provide potable water to the privatization site. This line was installed on the northwest boundary of C Tank Farm, paralleling an existing 12-inch raw water line. Industry standard construction techniques and materials were specified that permitted minimal joint leakage. Water resulting from the hydrostatic testing of the line, and the discharge and disposal of flush water following the installation was handled in accordance with the Washington State Storm Water Permit ST4508 which does not allow release of water within 91 m (300 ft) of a subsurface contamination zone. Similarly, future projects need to coordinate, where applicable, future construction activities of this nature to mitigate discharges into the farm areas. The installation of future pressurized lines in the farm areas should be discouraged.

3.2 WELL ASSESSMENT STUDY (Attachment II)

3.2.1 Summary

This study assesses 847 wells located in the SST farms for decommissioning. The vast majority of the monitoring wells were constructed between 1944 and 1984. A few wells have been constructed since 1984. The monitoring wells may provide a preferential pathway for contaminant migration to the groundwater. Historic Hanford Site records, including initial drillers logs and current spectral gamma ray logs, were used to determine well construction and identify irregularities.

The primary well types include groundwater wells (those that reach the groundwater), vadose zone wells (those that do not reach groundwater), abandoned wells (those of unknown closure methods), and wells decommissioned in accordance with WAC 173-160, *Minimum Standards for Construction and Maintenance of Wells.* Fifteen different types of well configuration are in the SST farms (described in Attachment II, Appendix A).

3.2.2 Fitness For Use Evaluation

A fitness-for-use (FFU) evaluation was performed on all wells within the scope of this study. The FFU (or fitness-for-intended-use) first looked at possible uses of the wells in the SST farms and if the wells were fit for these uses. Two possibilities were considered, monitoring of groundwater and monitoring of the vadose zone.

A program independent of the SST farms performs groundwater monitoring. Wells identified for the current monitoring program are all outside the SST farm boundary. Therefore, any groundwater wells within the farm are no longer needed or required, and no longer FFU.

The second consideration, monitoring of the vadose zone, evaluated the need for the vadose zone wells for monitoring possible tank leaks and contamination migration during interim operations, waste retrieval, and tank decontamination and decommissioning. All the wells within the farms are noncompliant in accordance with WAC-173-160 requirements, but most of the vadose zone wells are fit for the intended use for monitoring contamination of the vadose zone. However, there are several abandoned wells that are no longer accessible and therefore are no longer FFU.

The vadose zone wells were further evaluated by risk to the vadose zone and groundwater. Vadose zone wells in low-lying areas, where water or waste would migrate from a spill, are considered a higher risk. Vadose zone wells in these areas could provide a shorter preferential path for contamination to the groundwater presenting a higher risk to the groundwater and therefore are considered unfit for use.

The vadose zone wells were evaluated for beneficial use based on their location with respect to the tanks. Wells greater than 15 m (50 ft) away from the tanks were considered not to have the potential for providing leak or contamination monitoring during interim operation and waste retrieval, and therefore are considered unfit for intended use.

3.2.3 Conclusions

The 847 wells located in the SST farms were evaluated for compliance with WAC 173-160. The evaluation verified that most, if not all, tank farm wells do not comply with WAC 173-160.

Based on the existing condition and configuration, each well was assessed for FFU. This evaluation determined if the wells could provide useful information during future waste retrieval. Based on this assessment, the wells were separated into four decommission categories listed below as Priority 1, Priority 2, Priority 3, and wells that have already been decommissioned. Thirteen wells have been decommissioned per WAC 173-160 and require no further action.

Priority 1 (62 wells) are groundwater, vadose zone, and abandoned wells that present the highest risks to the groundwater and should be the first priority for decommissioning. Many of these wells come into contact with groundwater or are in detrimental locations.

Priority 2 (60 wells) are vadose zone wells that also present a high risk to the groundwater, however their distance from the tanks limits their use for monitoring during SST waste retrieval activities. These wells are identified as second priority for decommissioning.

Priority 3 (712 wells) are vadose zone wells located around the SST that also present a risk to the groundwater. However, because of their closeness to the tanks, these wells could be used or could provide vadose zone contamination monitoring during ongoing

operations and waste retrieval activities. Priority 3 is the last category identified for decommissioning.

The alternatives considered for intermediate steps prior to decommissioning and for decommissioning are:

Alternative 1. No action, i.e., leave all wells as they are currently.

Alternative 2. Seek a variance for all wells.

Alternative 3. Remove the well casings.

Alternative 4. Mechanically perforate the casing then fill with grout.

Alternative 5. Perforate the casing using the jet-shot method, then fill with grout.

Alternative 6. Cut, remove, and perforate; i.e., cut and remove inner casings then perforate the outer casing and fill with grout.

Alternative 7. Install a water-tight manhole over the top of each casing.

Table 3-4 provides a comparison of advantages and disadvantages of the alternatives, by number. A cost summary to decommission Priority 1, Priority 2, and Priority 3 wells is shown in Tables 3-5, 3-6, and 3-7, respectively. Table 3-8 provides a cost summary of unit prices to decommission or improve wells. These tables are also in Attachment II. Note: Alternative 3 costs are for Priority 3 wells only.

3.2.4 Recommendations

The first recommendation is to request a variance for all wells (Priority 1, 2, and 3 wells). The variance provides Washington State Department of Ecology (WDOE) with the status of all wells. The variance requested would be short term for Priority 1 and 2 wells and long term for the Priority 3 wells. The variance would be negotiated with WDOE as to the specific actions already taken and future actions to take to decommission the wells.

The preferred alternative for decommissioning the wells is to perforate the well casings using the jet shot process, (refer to Alternative 2c, Attachment II, Appendix D). This method has been used on the Hanford Site and meets Washington State requirements. Well decommissioning would be completed by pressure cement grouting the perforated

casing. Although the jet shot method utilizes explosives in the perforation process, normal industry construction techniques are available that would eliminate perceived safety hazards. Two methods are available to eliminate the potential for an explosive gas condition. The first method caps the top of the well and the second uses an inert gas.

Well capping allows for the closure of the top of the well while allowing for required cables that hold the jet shot in place and ignite the charge. This capping method seals the well and eliminates the potential for the ignition of any exterior gas. This method also confines any explosion within the well.

The second method uses an inert gas to purge the well and removes the oxygen from the well prior to the jet shot.

The wells were evaluated for potential future use in vadose zone testing, such as, soil sampling or cross-borehole partitioning inter-well tracer tests (PITT), which can provide information on subsurface conditions. This evaluation concluded that wells within Priority 1 and 2 are not recommended candidates for the special PITT or soil testing. The vadose zone wells within Priority 3 are the desirable candidates for special testing. Perforated vadose zone wells (refer to Attachment II, Appendix A, types C, C1, D, E, and F), would be useful for PITT since all the SST farms, except T Farm, have a large number of these types of wells available. Vadose zone wells with increased contamination, as detected by the spectral gamma ray logging, have been identified for soil sampling. Wells recommended for PITT and vadose zone soil sampling and the depths for monitoring in each well are identified in the tables in Attachment II, Appendix C.

Table 3-4*
WELL ASSESSMENT

Alternative/Cost	Advantages	Disadvantages
1. No Action	Annual operation and maintenance costs in current budget	Objectives of engineering study not achieved
Seek variance for wells	Facilitates compliance with state regulations	Survey of some wells may be required
	Cost dependent on negotiations	Negotiation with state required
		Data and justification submittal
2a. Remove Well Casing Estimated cost $7.5M**	Objectives of engineering study achieved	Very slow progress-as few as 50 feet per day
	Void is grout-filled as casing is removed	Must inject grout as casing is removed
	Eliminates hazard of infiltration via well casing	Maintain grout while removing casing
		Large volume of contaminated waste for disposal
		Casing may break or get stuck
2b. Mechanically Perforate Well Casing Estimated cost: $3.2M**	Widely used process	Impractical in wells with double or triple casing
	Objectives of engineering study achieved	Inconsistent perforations
	Large number of vendors	Requires grout injection
	No casing disposal	
2c. Jet Shot to Perforate Well Casing Estimated cost: $2.3M**	Objectives of engineering study achieved	Explosive charge to perforate well casing
	Commonly used process (90% of all perforations)	
	May be used in any well casing configuration or size	Concussion may affect waste tank on wells in close proximity (less than 2ft) to tank
	No casing disposal	
	Perforate any length casing and multiple casings at once	Requires grout injection
2d. Cut, Remove, and Perforate Estimated cost: $3.5M**	Applicable to multiple casings. Remove inner, perforate outer	Similar to remove casing and mechanical perforation
		Increased waste volume for disposal, including casing
	Objective of engineering study achieved	Potential spread of contamination
		Removal of inner casing and grout may be difficult and slow
3. Watertight Manhole Estimated cost: $4.3M (Priority 3 wells only)	Easy to locate each well	Variance still required
	Provides barrier to surface water migration into the casing	
	Maintain vehicle access	
	Partial compliance with state regulations	

*This table is duplicated in Attachment II (Table 6-3).

**Priority 1 wells only.

Table 3-5*

ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 1 WELLS FOR DECOMMISSIONING

Tank Farm	Number of Wells to Decomm.	Linear Feet of Wells to Decomm.	ALT. 2a Cost to Remove Well Casing ($ x 1000)	ALT. 2b Cost to Perforate Casing w/Jet shot or Mech. ($ x 1000)	ALT 2c Cost to Perforate Casing w/Jet shot ($ x 1000)	ALT 2d Cost to Remove Inner Casing and Mechanical Perforate ($ x 1000)
A	4	1,351	$1,165	$498	$351	$513
AX	13	1,663	$1,435	$615	$484	$581
B	0	0	$0	$0	$0	$0
BX	2	28	$24	$10	$8	$10
BY	1	275	$237	$102	$74	$96
C	0	0	$0	$0	$0	$0
S	3	627	$541	$231	$162	$219
SX	6	1,213	$1,046	$447	$330	$423
T	24	3,100	$2,674	$1,060	$817	$2,031
TX	0	0	$0	$0	$0	$0
TY	2	461	$398	$171	$127	$162
U	0	0	$0	$0	$0	$0
TOTAL	55	8,718	$7,520	$3,174	$2,347	$3,465

*This table is duplicated in Attachment II (Table II-E-1)

Notes:

1) For well decommissioning unit prices, refer to Table 3-8.
2) Activity description - cost basis
   a) Alternative 2b consist of mechanical perforation of the single casing portion of the well length and jet shot perforation of the double casing portion of the well length.
   b) Alternative 2c consist of jet shot perforation of the entire length of the well casing.
   c) Alternative 2d consist of mechanical perforation of the entire length of the well casing.
3) The total number of wells indicated and the associated total costs do not reflect wells added/deleted in Revision 1. The impact to the total (ROM) cost estimates account for less than 1% of the total costs shown. Therefore, there is no significant impact on the total costs.

Table 3-6*

ORDER OF MAGNITUDE – COST SUMMARY PRIORITY 2 WELLS FOR DECOMMISSIONING

Tank Farm	Number of Wells to Decomm.	Linear Feet of Wells to Decomm.	ALT. 2a Cost to Remove Well Casing ($ x 1000)	ALT. 2b Cost to Perforate Casing w/Jet shot or Mech. ($ x 1000)	ALT. 2c Cost to Perforate Casing w/Jet shot ($ x 1000)	ALT. 2d Cost to Remove Inner Casing and Mechanical Perforate ($ x 1000)
A	2	301	$259	$111	$78	$114
AX	7	92	$80	$34	$27	$32
B	8	915	$789	$325	$245	$373
BX	17	2,135	$1,842	$781	$577	$764
BY	0	0	$0	$0	$0	$0
C	7	684	$590	$252	$187	$267
S	2	300	$259	$111	$77	$105
SX	4	355	$306	$131	$97	$124
T	5	723	$624	$247	$190	$474
TX	6	900	$776	$331	$253	$318
TY	0	0	$0	$0	$0	$0
U	4	600	$518	$217	$154	$230
TOTAL	62	7,005	$6,043	$2,550	$1,886	$2,784

:

* This table is duplicated in Attachment II (Table II-E-2).

Notes:
1) For well decommissioning unit prices, refer to Table 3-8
2) Activity description - cost basis
   a) Alternative 2b consist of mechanical perforation of the single casing portion of the well length and jet shot perforation of the double casing portion of the well length.
   b) Alternative 2c consist of jet shot perforation of the entire length of the well casing.
   c) Alternative 2d consist of mechanical perforation of the entire length of the well casing.
3) The total number of wells indicated and the associated total costs do not reflect wells added/deleted in Revision 1. The impact to the total (ROM) cost estimates account for less than 1% of the total costs shown. Therefore, there is no significant impact on the total costs.

Table 3-7*

ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 3 WELLS FOR DECOMMISSIONING

Tank Farm	Number of Wells to Decomm.	Linear Feet of Wells to Decomm.	ALT.2a Cost to Remove Well Casing ($ x 1000)	ALT. 2b Cost to Perforate Casing w/Jet shot or Mech ($ x 1000)	ALT. 2c Cost to Perforate Casing w/Jet shot ($ x 1000)	ALT. 2d Cost to Remove Inner Casing and Mechanical Perforate ($ x 1000)	ALT. 3 Cost to Install Watertight Manhole ($ x 1000)
A	47	5,221	$4,504	$1,923	$1,355	$1,984	$282
AX	32	3,182	$2,745	$1,177	$926	$1,112	$213
B	40	4,337	$3,742	$1,539	$1,160	$1,767	$240
BX	62	6,609	$5,701	$2,419	$1,785	$2,364	$368
BY	70	7,376	$6,363	$2,723	$1,985	$2,574	$413
C	63	6,645	$5,732	$2,449	$1,818	$2,595	$371
S	68	7,544	$6,508	$2,785	$1,945	$2,630	$404
SX	94	9,490	$8,187	$3,498	$2,582	$3,307	$557
T	66	6,787	$5,855	$2,320	$1,788	$4,447	$386
TX	91	9,241	$7,972	$3,399	$2,603	$3,260	$559
TY	21	2,778	$2,396	$1,030	$765	$975	$174
U	55	6,447	$5,562	$2,335	$1,654	$2,472	$332
TOTAL	709	75,657	$65,267	$27,576	$20,368	$30,071	$4,299

*This table is duplicated in Attachment II (Table II-E-3)

Notes:
1) For well decommissioning unit prices, refer to Table 3-8.
2) Activity description - cost basis
   a) Alternative 2b consist of mechanical perforation of the single casing portion of the well length and jet shot perforation of the double casing portion of the well length.
   b) Alternative 2c consist of jet shot perforation of the entire length of the well casing.
   c) Alternative 2d consist of mechanical perforation of the entire length of the well casing.
3) The total number of wells indicated and the associated total costs do not reflect wells added/deleted in Revision 1. The impact to the total (ROM) cost estimates account for less than 1% of the total costs shown. Therefore, there is no significant impact on the total costs.

Table 3-8*

ORDER OF MAGNITUDE - COST SUMMARY
WELL DECOMMISSIONING OR IMPROVEMENT
UNIT PRICES

Tank Farm	Number of Wells (see Note)	Linear Feet of Wells	ALT 2a Remove Well Casing and Grout (per lf)	ALT. 2b Perforate Casing w/Jet Shot or Mechanically Perforate and Grout (per lf)	ALT 2c Perforate Casing w/Jet Shot and Grout (per lf)	ALT. 2d Cut and Remove Inner Casing, Mechanically Perforate and Grout (per lf)	ALT. 3 Watertight Manhole (per ea)
A	53	6,873	$862.67	$368.38	$259.49	$379.95	$5,982
AX	52	4,936	$862.67	$370.04	$291.05	$349.51	$6,637
B	48	5,252	$862.67	$354.74	$267.45	$407.32	$5,979
BX	81	8,772	$862.67	$366.00	$270.06	$357.73	$5,943
BY	71	7,651	$862.67	$369.18	$269.12	$348.91	$5,898
C	70	7,329	$862.67	$368.61	$273.56	$390.51	$5,896
S	73	8,471	$862.67	$369.18	$257.88	$348.58	$5,935
SX	104	11,058	$862.67	$368.56	$272.07	$348.49	$5,929
T	95	10,610	$862.67	$341.79	$263.39	$655.20	$5,853
TX	97	10,141	$862.67	$367.77	$281.63	$352.78	$6,145
TY	23	3,239	$862.67	$370.81	$275.70	$350.98	$8,254
U	59	7,047	$862.67	$362.11	$256.58	$383.46	$6,028
TOTAL	826	91,379	$862.67	$364.09	$269.21	$397.47	$6,064

*This table is duplicated in Attachment II (Table II-E-4)

Note: The total number of wells indicated does not reflect wells added/deleted in Revision 1. The impact to the unit cost figures account for less than a 1% change in the figures shown. Therefore, there is no significant impact on the unit costs shown.

3.3 SURFACE WATER ASSESSMENT STUDY (Attachment III)

3.3.1 Summary

The visual assessment of the SST farms revealed that the surface of the ground within the farms is almost flat, less than 1% slope. The soils are very porous, mostly sand and gravel. There is no vegetation on the surface of the farms. In TX, TY, and BX Tank Farms, a loose gravel surface was installed as part of the "controlled, clean, and stable" program.

Some of the SST farms are located in low-lying areas of the 200-East and 200-West Areas with no provisions for stopping or reducing surface water run-on to the farms. This problem was made evident by a major water line break that flooded the S and SY Tank Farms in 1996. Another scenario for severe run-on from outside the fence and onto the farm can occur during winter months when the soil is frozen, considerable snow is on the ground, and the area experiences a chinook or severe rainstorm.

The surface features vary among the tank farms. Tank Farms A, AX, BY, C, S, SX, TX and U are congested with numerous risers, valve pits, and pump pits. Tank Farms B and TY are nearly free of aboveground obstructions. Tank Farms BX and T have several risers and pits. Such obstructions require additional hand labor for the installation of any barriers. In addition, there are existing berms over transfer lines in many of the farms, which need to be accommodated.

The majority of SST farms have load-limiting restrictions regarding additional tank dome loading. Dome load calculations for each tank farm would need to be reviewed as part of the definitive design package for any barrier installation.

3.3.2 Conclusions

Based on SST farm surface conditions, major surface regrading would be required to achieve surface water run-off. This is unacceptable considering the high-permeability of the soil in the tank farms. The slopes would have to be a minimum of 30% before water would run off the majority of the farms. This would limit access and overload the tank domes. Considering the porous soils on the tank farms, the majority of the water would still penetrate the surface prior to reaching areas outside the tank farms.

Another problem identified with surface water is run-on to the farms from areas outside the farms. To prevent water from entering the farm from outside, run-on control measures could be erected outside the fence line. These measures are discussed in Attachment III.

Within the farms, three barrier types were evaluated and determined capable of providing reasonable restriction to surface water infiltration. They were: 1) a subsurface barrier (geo-fabric liner), 2) a surface barrier (asphalt concrete pavement), and 3) an overhead structure (building).

Alternatives considered in this study are:

1. No Action
2. Site grading
3. Geo-fabric liner
4. Asphalt concrete paving
5. Building enclosure with asphalt apron
6. Run-on control.

Table 3-9 provides a comparison of advantages and disadvantages of the alternatives, by number. Surface water control costs are shown in Table 3-10. These tables are also found in Attachment III.

3.3.3 Recommendations

The recommendation to substantially reduce surface water accumulation and infiltration in the SST farms utilizes a combination of alternatives. First, to control the run-on, berms, lined ditches, or other devices should be constructed outside the farm boundaries to divert run-on away from the tank farms (Alternative 6 in Attachment III, Section 5.2.6.). The tank farms should be prioritized for the construction sequence of run-on control construction.

Second, the type of surface barrier over the tank farm must be determined. A decision regarding the need for each tank farm surface barrier should be based on a risk analysis. Any surface barrier is a potential impediment to retrieval activities and this must be taken into account as part of the risk analysis. The risk analysis should be a part of the RCRA corrective measures study (CMS).

Selected mitigating measures must comply with the Washington State Water Storm Permit ST 4510 for storm water removal. Application for a new permit or modification of the existing permit may be required.

Table 3-9*
SURFACE WATER ASSESSMENT

Alternative/ Cost	Advantages	Disadvantages
1. No Action	Annual operation and maintenance costs in current budget	Objectives of engineering study not achieved
2. Site Grading Estimated cost: $2.80M	Simplest	Cannot achieve sufficient slope to control flow
	Partially controls surface water flow	Porous soil in farm Dome loading restrictions
3. Geo-fabric Liner Estimated cost: $89.5M	Absorption layer over impervious membrane allows evaporation	Maintenance if liner is damaged
	Substantial reduction in infiltration	Hand excavation required for installation
	Objectives of engineering study achieved	Excavated soil may be contaminated and require removal. Costs assume 50% soil removal.
	Proven technology	
4. Asphalt Concrete Paving Estimated cost: $41.5M	Semi-impervious surface barrier is proven technology	Heat retention in summer.
		All excavation and paving performed by hand.
	Control water flow at surface	Annual maintenance and repair
	Objectives of engineering study achieved	Sealing around surface obstructions done by hand
		Excavated soil may be contaminated and require removal. Costs assume 50% soil removal.
5. Building Enclosure with Asphalt Apron Estimated cost: $200M	Eliminates infiltration	Foundation may affect underground utilities
	Controlled interior environment	May impact budgets for other programs
	No weather related work stoppage	Long-term operating costs
	Option to add bridge crane to support Operations and Maintenance	
	Reduce spread of contamination	
	Support retrieval and decommissioning	
	Short schedule to install	
	Objectives of engineering study achieved	
	Estimated 25 year life	
	Option to add ventilation system	
6. Run-on Control Estimated cost: $787K	Eliminate run-on to SST farms	Objectives of engineering study not fully achieved. Berms may limit access to farms.
	Does not disturb contaminated soil, or farm activities	
	Installation may use motorized equipment	

*This table is duplicated in Attachment III (Table 6-3)

Table 3-10*

SURFACE WATER CONTROL COST INFORMATION SUMMARY

Tank Farm	ALT 2 Site Grading ($ x 1000)	ALT. 3 Geo-fabric Liner ($ x 1000)	ALT.4 Asphalt Concrete Paving ($ x 1000)	ALT.5 Building Enclosure with Asphalt Apron ($ x 1000)	ALT.6 Run-on Control ($ x 1000)
A	$153	$6,387	$2,805	$7,819	$55
AX	$110	$4,616	$2,021	$4,992	$11
B	$243	$6,844	$3,261	$19,027	$97
BX	$251	$7,121	$3,415	$18,245	$95
BY	$251	$10,476	$4,589	$18,385	$0
C	$212	$6,030	$2,892	$17,663	$108
S	$251	$7,058	$3,373	$18,245	$87
SX	$285	$8,123	$3,892	$20,831	$79
T	$255	$7,210	$3,440	$18,766	$54
TX	$375	$10,574	$5,054	$28,049	$79
TY	$155	$4,375	$2,091	$7,438	$16
U	$255	$10,646	$4,658	$21,030	$106
TOTAL	**$2,796	$89,460	$41,491	$200,490	$787

* This table is duplicated in Attachment III (Table 6-4)

**Only portions of most tank farms require grading.

3.4 OVERALL STUDY RECOMMENDATIONS

The recommended implementation plan applies a graded approach to the interim measures. Interim measures priorities are also based on risk and cost effectiveness.

Priority 1	Request a variance for all wells to facilitate compliance with state regulations.
Priority 2	Waterline exploration to verify status of active/inactive water lines. Locate and identify active water lines and establish a priority for fitness for use testing or abandoning in place.
Priority 3	Complete actions to abandon in place all water lines within the farms to eliminate existing and potential leaking water lines.
Priority 4	Provide run-on control at the farms to eliminate run-on from outside sources.
Priority 5	Abandon, repair, or replace water lines outside the farms to reduce potential for large volume water line breaks or leaks.
Priority 6	Decommission all Priority 1 wells to eliminate current paths to groundwater.
Priority 7	Decommission all Priority 2 wells to eliminate unneeded wells within the farms.
Priority 8	Decommission all Priority 3 wells, following SST farm retrieval activities as part of RCRA CMS.
Priority 9	Evaluate installation of surface barriers as part of RCRA CMS.

Requesting and obtaining a variance for all Priority 1, 2, and 3 wells will facilitate compliance with Washington State regulations. This activity should be performed first and requires negotiating with the WDOE on specific variance requirements. A short-term variance will be requested for Priority 1 and 2 wells, and a long-term variance requested for Priority 3 wells.

Locating and identifying active water lines is the interim measure Priority 2 recommendation because these leaking lines provide the greatest risk to the vadose zone. The pressurized water lines potentially provide a large long-term volume of liquid to transport contamination through the vadose zone, whether through the soil or via a well casing. Minimizing the potential for this large source of liquid provides the greatest benefit for the relative low cost of isolating all active lines.

The next recommendation is to provide run-on control at all SST farms. This is a very low cost activity ($787,000) for limiting the risk of liquid run-on from surrounding areas. Run-on control addresses water resulting from water line breaks outside the farms and weather conditions, such as precipitation or rapid snow melt.

Contamination levels should be the basis for prioritizing which farms to work in first. This process provides the greatest reduction in risk to the vadose zone. Table 3-11 provides a qualitative rank of the level of contamination on the SST farms from greatest to least. The table is based on information in the monthly Waste Tank Summary (Hanlon) Report. The farms are ranked using a combination of the number of leaking tanks and the volume of waste leaked from those tanks.

Table 3-11

SST FARM CONTAMINATION

Most Contaminated to Least Contaminated
SX Tank Farm
S Tank Farm
BX Tank Farm
BY Tank Farm
B Tank Farm
T Tank Farm
TY Tank Farm
TX Tank Farm
C Tank Farm
U Tank Farm
A Tank Farm
AX Tank Farm

Numerous ways these recommendations could be implemented include:

- Decommission Priority 1 wells in all farms to make use of the learning curve.

- Do all required interim measures at one farm.
- Do all required interim measures in the most contaminated farms and high priority measures in other farms.
- Do some activities in some farms and other activities in other farms.
- Least cost first, etc.

It is beyond the scope of this study to recommend how each farm's activities should be completed and prioritized other than those recommendations already given. Individual farm priorities are always changing, and funding can vary from year to year.

4.0 COSTS AND SCHEDULE

An activity schedule has been prepared for each alternative, expressed in crew shifts, for an 8-hour shift. The schedule does not account for inclement weather. Depending on the project, several crews could be working at any one time. Table 4-1 identifies the activity duration for the schedule and the total site cost for each preferred alternative.

Table 4-1

DURATION AND COSTS FOR PREFERRED ALTERNATIVES

Preferred Alternative	Costs	Schedule
Waterline Assessment Study		
Waterline Exploration (lines with poor documentation)	$195,000	1 week/farm
Alternative 3: Water lines abandoned in place	$648,000	1-2 weeks/farm
Well Assessment Study		
Alternative 2c: Jet Shot Perforation		
Priority 1 Decommission	$2,347,000	20–25 weeks
Priority 2 Decommission	$1,886,000	25–30 weeks
Priority 3 Decommission	$20,368,000	20–25 weeks/ farm
Alternative 3: Extend Well Casing	$4,299,000	5–10 weeks
Surface Water Assessment Study		
Alternative 6:Run-On Control	$787,000	2–3 weeks/farm
Alternative 5:Building Enclosure	$200,490,000	2–3 months/ farm

Rough order of magnitude (ROM) cost estimates are provided for the preferred alternative from each of the three studies. Included in these costs are CHG overview operational costs for support of construction, 30%; FH support cost, 17.38% on project cost and 16.19% on CHG costs; and project costs (equipment, materials, labor, engineering, contract management, and direct disposal cost, i.e., for contaminated soils and materials).

The ROM costs do not include operation and maintenance costs. Detailed costs for all the alternatives have been prepared for each study (see Attachments I, II, and III).

Revision 1 of this document revises the estimates to incorporate the most current site allocation factors and to reflect proposed changes in the method of work performance. During a detailed planning effort for a portion of the Run-on Control effort, it was determined that the costs previously provided were not adequate to address executing the work as addressed by the Statement of Work. Dividing the proposed work into numerous contracts (addressing farms individually rather than performing work as a single project addressing multiple farms) increases the proportional costs of engineering, engineering during construction, construction management, survey, and site plan development.

5.0 REFERENCES

Gee, G. W., M. J. Fayer, M. L. Rockhold, and M. D. Campbell. 1992. *Variations in Recharge at the Hanford Site*, Northwest Science, Vol. 66, No 4.

Gee, G. W, P. J. Wierenga, B. J. Andraski, M. H. Young, M. J. Fayer, and M. L. Rockhold. January-February 1994. *Variations in Water Balance and Recharge Potential at Three Western Desert Sites*, Soil Science Society of America Journal, Volume 58, No. 1.

Gee, G. W., A. L. Ward, and R. R. Kirkham. June 2-3, 1998. *Long-Term Stewardship Workshop*, Conference Proceedings 980652, U. S. Department of Energy, Grand Junction Colorado.

Hoitink, D. S., K. W. Burk, J. V. Ramsdell. April 1999. Hanford Site Climatological Data Summary 1998 with Historical Data, PNNL-12087.

Tyler, S. W., B. R. Scanlon, G. W. Gee, G. B. Allison. 1999. *Water and Solute Transport in Arid Vadose Zones*, Vadose Zone Hydrology, Cutting Across Disciplines, Oxford University Press, pp. 334-373.

ATTACHMENT I

WATER LINE ASSESSMENT

ENGINEERING STUDY

ATTACHMENT I

WATER LINE ASSESSMENT FOR SINGLE-SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

March 2001

Subcontract LMHC 96WO-0006

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ENGINEERING STUDY
WATER LINE ASSESSMENT
FOR
SINGLE-SHELL TANK FARMS
INTERIM MEASURES TO LIMIT
INFILTRATION THROUGH THE VADOSE ZONE

1.0 INTRODUCTION

Operation activities within the Hanford Site single-shell tank (SST) farms have contributed to contamination of the soil above, around, and below the SSTs. Studies indicate that water passing through the soil column and the vadose zone contributes to the continued migration of this contamination into the groundwater (Gee 1992, 1994, 1998, and Tyler 1999).

This water line assessment addresses the active and inactive raw and potable water (RW/PW) piping serving the SST farms. These include lines labeled as sanitary or potable water, raw and well water lines, and fire water. Geographically, the study includes the area of the SST farm and the area within 500 feet of the SSTs, hereinafter referred to as the farm area. Only pressurized RW/PW lines are identified. There are approximately 27 km (17 miles) of 1/2-in. to 24-in. diameter water lines, 30-55 years old, buried within the farm areas. Drain lines or waste transmission lines are not included in the scope of this study (i.e., gravity and pressurized sanitary and process sewers, chemical, contaminated effluent, steam and condensate drain, slurry, or supernatant drain lines are not included), because they have less potential to cause containment migration.

The object of this engineering study report is to identify and evaluate alternatives for minimizing the potential for water infiltration due to the leakage of pressurized water lines within and nearby the SST farms. This study, in conjunction with related reports on the surface water control and

monitoring well investigations within the SST farms, will provide a basis of interim remedial action targeted at controlling contamination migration through the vadose zone, defined as the area between the soil surface and groundwater. This work is being performed in accordance with Tri-Party Agreement (TPA) milestone M-45-56-T01.

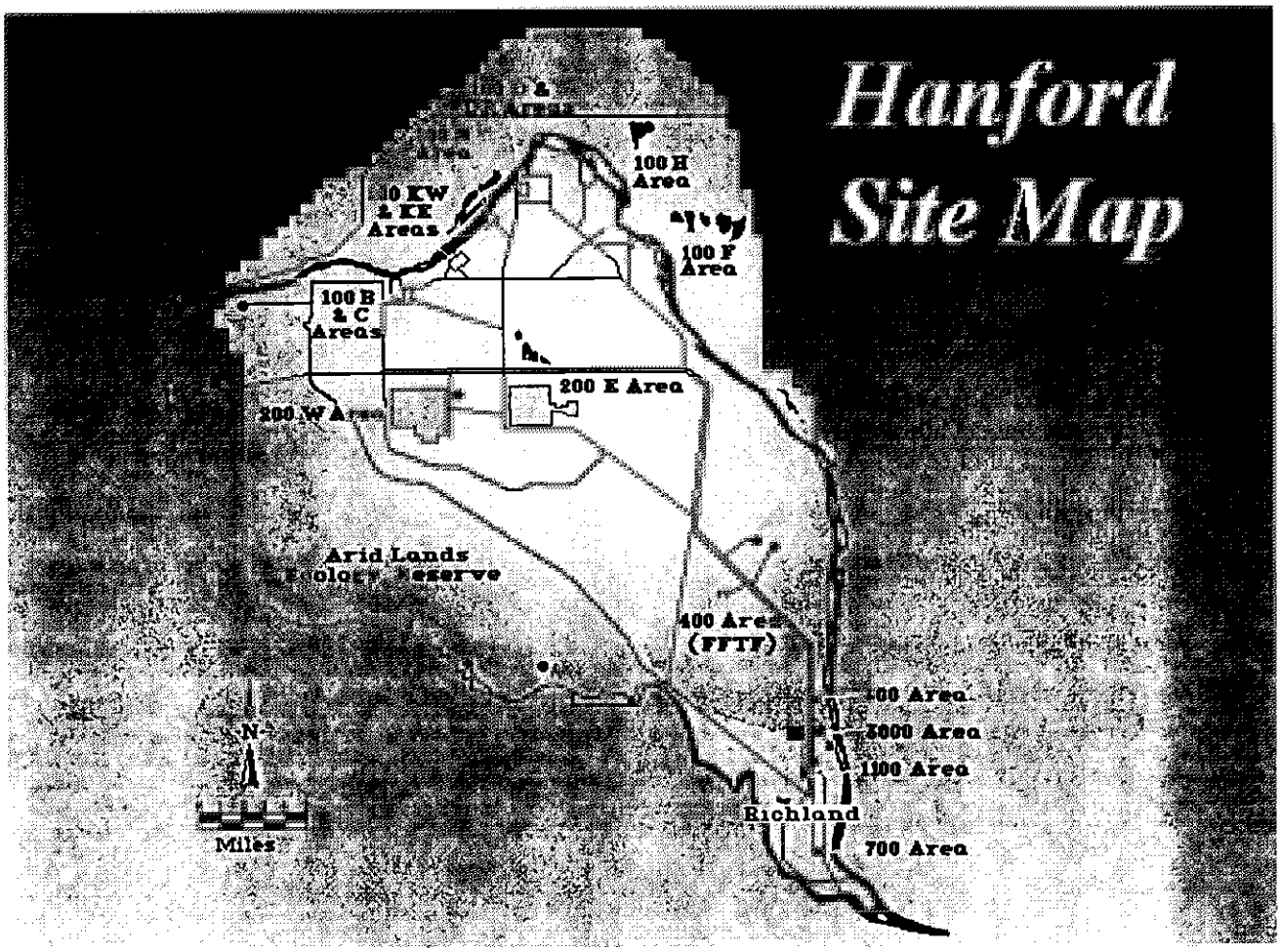

Figure 1. **HANFORD SITE MAP**

2.0 SUMMARY AND CONCLUSIONS

Review of record drawing files indicated that as-built records are incomplete and inconsistent. Numerous drawings were created over the years and the ability to identify the active/inactive status of a given water line is not readily known without some field testing. Complete RW/PW

system drawings should be created and placed in the Hanford Site drawing control system and maintained as essential drawings for the 200 Area.

The status of the active/inactive lines within the SST farm should be verified and defined prior to taking any action on the buried lines. Existing water lines within the farm areas should be verified active or inactive, then inactive lines cut, capped, and abandoned in place at the water main. Active main lines within the farm areas should be evaluated on a graded approach. The main lines passing a fitness-for-use (pressure) test would be left in place; those that do not pass would be cut, capped, and abandoned in place. Water leakage into the soil column will be significantly reduced when all the water lines are isolated within the farm areas.

Field verified as-built documentation should be developed, and accurate essential drawings for the water systems in and around the farm area should be provided as measurable corrective action taken to comply with Washington Administrative Code (WAC) 173-303, *Dangerous Waste Regulations*. The existing site drawings should be updated or new drawings created to document the isolations performed. Creating these as-built drawings is outside the scope of this study. The water needed for interim stabilization and retrieval operations should be provided by water tank trucks, skid-mounted water tanks with limited tank capacity, aboveground pipelines, or new pipelines where mains need to stay in service.

The cost for the water line assessment preferred alternative (verify status, cut, cap, and abandon in place active and inactive lines) is approximately $843,000.

3.0 APPROACH/EVALUATION

The best possible alternatives have been investigated to minimize the potential for leaking water lines in and around the SST farms. Initially, a drawing search of the microfilm files for the farm areas was conducted to identify the documented pressurized water lines. The search included reviewing drawings and engineering change notices (ECN) to develop engineering sketches (ES) that show the location of these water lines. Information was sought to determine the status (active/inactive) and history of the RW/PW lines in the farm areas. Operations and engineering personnel were interviewed to identify where active lines were located within the farm areas.

Sketches were developed using the CAMIS mapping system. The sketches are shown in Appendix C. These sketches show the general layout of the tank farms with some physical features (fences, buildings, tanks, etc.) to orient the viewer to each farm. Once the water lines were mapped around the SST farms to a distance of 150 meters (500 feet) or more away from the farms, the lines were labeled active or inactive. The solid lines on the sketches represent the active pipes in use within or adjacent to the farm area. The dashed lines represent the inactive pipes where documentation indicates the pipes have been abandoned. Thus, the sketches identify the water lines that have the potential to contribute to vadose zone contamination problems. The RW/PW lines represent only a small portion of all the pipelines and conduit buried within the farm areas; however, other utility and service lines have been omitted for clarity on these sketches.

The Dyncorp water purveyor and operations/maintenance personnel were interviewed to identify the active lines that supply water to the individual tank farms. The water purveyor is responsible for water mains, and operations/maintenance personnel are responsible for lines inside the tank farm fenced areas. Record drawings, including ECNs, were used to determine which lines were active or inactive. Positive documentation was available for some lines but most often information was in the form of testimonials, with approximations as to where lines had been capped and taken out of service. Interviews alone were not conclusive in determining that pipeline isolations had taken place. While larger diameter service main lines outside the farms were fairly well documented, information associated with the smaller lines within the farm area was ambiguous. ECNs that documented service disconnections or isolations were acknowledged, but when the "Work Completed" block was not signed off, the lines were assumed to be active.

4.0 DECISION CRITERIA

Decision criteria are used to distinguish among the alternatives and represent a mixture of quantitative and qualitative factors. These criteria have been established to evaluate the potential advantages and disadvantages associated with implementing a given alternative. Some of the criteria, such as cost, represent directly measurable variables while other criteria, such as

operability, are more dependent on the judgement of experienced engineers. The criteria are not all-inclusive nor detailed in scope. They represent a wide range of safety, social, and economic issues that permit the screening of potential alternate technologies for acceptability. The alternatives are analyzed to select those deemed to have the greatest possibility for successful implementation.

4.1 SAFETY AND HEALTH

Public and worker safety and health is of prime concern. A positive and active effort must be included in all work to reduce hazards to a minimum consistent with accepted practices and regulatory requirements. CHG's "Safe Project Delivery" program implemented in August 2000, supports the emphasis on safety issues as a decision criterion.

4.1.1 Public Safety

Protection of the general public from Hanford Site hazards is of paramount importance. Any safety problem with an impact beyond the confines of the controlled portion of the site is considered a public safety issue.

4.1.1.1 Radiation Releases. Releases where radioactivity is the principal hazard

a. Chronic releases: Small continual releases associated with normal operation.
b. Accidental releases: Unplanned releases due to equipment malfunction or operator error.

4.1.1.2 Nonradioactive Releases. Releases with radiation below the allowable limits where the principal hazard is chemical compounds.

4.1.2 Worker Safety

Worker safety is a critical aspect of all jobs on the Hanford Site and must receive careful consideration. Worker safety pertains to individuals working directly with the equipment or in adjacent areas and includes all personnel within the confines of the controlled portion of the Hanford Site.

4.1.2.1 Radiation Exposure

a. Chronic exposure: Exposure associated with the day-to-day operation and maintenance. This type of exposure should be minimized by implementation of the as-low-as-reasonably-achievable (ALARA) program. Contact operation and maintenance of radioactive equipment should be avoided where possible and remote techniques should be utilized.

b. Accidental exposure: Unplanned exposure due to equipment malfunction or operator error. Applying engineering controls and radiation barriers should minimize these exposures.

4.1.2.2 Chemical Exposure. The exposure to hazardous chemicals should be eliminated where possible, and where not possible, should be reduced to acceptable regulatory standards.

4.1.2.3 Industrial Safety. Industrial safety is the consideration of normal construction hazards such as tripping, falling, improper use of tools, working in proximity to heavy equipment, electrical shock, etc. Industrial safety includes most hazards normally associated with construction, maintenance and operation of plant facilities, and equipment.

4.1.3 Environmental Safety

Environmental safety is the evaluation of the alternatives versus how the construction, operation, and maintenance could affect the environment.

4.1.3.1 Protection of the Biota. Protection of the flora (plant life) and fauna (animal life).

4.1.3.2 Groundwater Protection. Construction, operation, or maintenance activities that produce any hazardous liquid or material that constitute a threat to groundwater if not properly controlled. This could include unplanned releases due to equipment malfunction or operator error.

4.1.3.3 Atmospheric Protection. Construction, operation, or maintenance activities of the alternative that release hazardous gases or volatile liquid. Will the activity contribute substantially to blowing dust, possibly carrying radionuclides that could affect air quality? Will the alternative generate releases associated with the day-to-day operation and maintenance or unplanned releases due to equipment malfunction or operator error?

4.2 REGULATORY COMPLIANCE

All work and equipment shall comply with applicable U. S. Department of Energy (DOE) orders, Washington State statutes, and Environmental Protection Agency (EPA) regulations. The regulatory compliance decision criteria include consideration of regulatory compliance, permitting, and complexity issues. Permitting requirements should be evaluated based on the number of permits required or modified, the complexity of required permitting documentation, potentially required permits or approvals unique to the system being examined, regulatory obstacles, and the impact of permitting activities on the project schedule.

4.3 LIFE-CYCLE COST

To the extent practical, the system, equipment, or component will be evaluated with respect to capital, operating, and decontamination/decommissioning life-cycle costs.

4.3.1 Capital Cost

Includes all costs for design, construction, and incidentals for the facility or equipment.

4.3.2 Operating Cost

Includes normal costs associated with the day-to-day operation and maintenance of equipment or facility.

4.3.3 Decontamination and Demolition

All costs for final cleanup, demolition, and disposal of equipment or facility.

4.4 TANK INTEGRITY

The SSTs have exceeded their original design life, and information concerning the physical condition of the tank structure is limited. Potential structural integrity concerns and impacts associated with SST waste storage and removal operation could influence the selection of the preferred alternative.

4.5 FUTURE RETRIEVAL AND PROCESSING

The potential impact on future retrieval, transport, storage, and waste processing operations should be evaluated for each alternative. Actions that may potentially compromise, severely impact, or complicate these activities should be identified and described.

Existing and planned waste retrieval from the SSTs are principally designed to handle and transfer liquids. Waste retrieval involves sluicing or mixing present solids with liquids to permit the transfer of the liquid and slurry via pumps through existing and planned transfer lines to storage and process facilities. Installation of this equipment should not be restricted.

It is possible that contaminated soils associated with the SSTs may need to be removed or treated. The alternatives considered should be evaluated as to their potential to limit this activity.

4.6 SCHEDULE

Alternatives should be evaluated with respect to whether they could impact other TPA milestones and if the alternatives can be constructed in a timely manner.

4.7 PROVEN TECHNOLOGY

The technical maturity of a process, system, or product can affect its performance. The overall performance of a product could be a factor of the complexity of construction. The demonstration of operational readiness within established schedule constraints could be considered a function of technical maturity. Maturity can also be expressed in terms of the hierarchy, shown in Table 4-1.

Table 4-1

TECHNOLOGY MATURITY

PHASE	DESCRIPTION OF ACTIVITIES
Available	Technologies that are applied on a production scale in a conventional commercial industry.
Field Testing	Technologies that have been demonstrated on a pilot scale under similar circumstances.
Prototype	Technologies that have been demonstrated on a bench scale using simulated feed materials.
Under Development	Technologies that are supported by conceptual studies that are not backed by bench scale experiments.
Unavailable	Technologies that are not available for use.

In addition to the hierarchy given above, other factors that influence technical maturity or technology assurance include: (1) maximizing flexibility (adaptability for new technologies or mission change), (2) design flexibility or adaptability for incorporating improved technology, and (3) avoiding regulatory uncertainty.

4.8 MAINTAINABILITY

Evaluating the complexity, reliability, and repairability of the associated product and components can help assess the maintainability of a system. Complexity is influenced by factors such as the level of training required to perform maintenance on the equipment, the need for special or unique tools or procedures, design qualities such as features that ease repair, standardized parts, and provisions for troubleshooting. Reliability can be measured directly by failure rates/mean time to failure data, but it is also associated with frequency of test, calibration, and preventive maintenance procedures. Another key measure of reliability is the impact of failures on the process, including recovery or downtime following a failure. Repairability is a factor of several items, including work space, location of the equipment, methods of repair or replacement, personnel requirements, technical training, waste produced during repairs, and any functional test requirements. With regard to these aspects of maintainability, this analysis will highlight those characteristics that are significantly different among the alternatives.

4.9 OPERABILITY

Operability of a facility is a typical measure of the complexity of an item or system that may influence other aspects of operations, such as the following:

- Startup and Shutdown of the System. Most upset conditions can occur during startup or shutdown when the system is in an unsteady state condition. Identifying how the proposed alternative affects these farm area activities is an important operability issue.

- Process Control. Will the proposed alternative affect normal operations, activities, or process control (samples equipment removal or replacement, etc.)?

- Troubleshooting and Response to Off-Normal Conditions. Will the proposed alternative affect the ability to troubleshoot or respond to an off-normal condition?

- Operator Interfaces. Will the alternative require significant operational interface or control?

4.10 CONSTRUCTIBILITY

Constructibility is a measure of difficulty and probability of satisfying all design/construction specifications within the physical, chemical, and radiological environment in which construction must occur.

4.11 DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL

This criterion is a measure of the difficulty and probability of achieving successful decontamination and decommissioning (D&D) and disposal of decontaminated materials at the completion of the mission.

5.0 DESCRIPTION OF ALTERNATIVES

5.1 ASSUMPTIONS, CONSTRAINTS, AND REQUIREMENTS

Multiple factors enter into determining what remedial actions are suitable for protecting the groundwater from leaking water lines and the applicable assumptions, constraints, and requirements are critical to the successful resolution of the issue. These items provide the framework and boundary limits for implementation of the actions within the system.

5.1.1 Assumptions

Assumptions are necessary to set boundaries for the alternatives and to provide a better understanding of how the alternatives apply to the problem. They also provide a set of limiting conditions under which the alternative is valid. The following assumptions were considered in the evaluation of the alternatives:

- All abandoned water lines are considered active unless proof-positive documentation exists or field-testing shows otherwise.
- All buried water lines leak unless proof-positive documentation exists or field-testing shows otherwise.
- The scope of this study focused only on the RW/PW lines identified on the record drawings listed in the references.
- Existing gravity drain lines, transfer lines, steam condensate return lines, etc., were not addressed. They do not pose as significant a threat to groundwater intrusion when compared to that created by pressurized lines.
- The SST farm environment is a radiation zone and consequently construction activities are to be limited within the farms.
- All work within these zones requires operational and program controls to ensure all personnel are trained and protected following ALARA safety procedures with full-time health physics technician coverage.
- The implementation of any alternatives shall support future retrieval and D&D activities, such as providing crane access for equipment removal and installation.

5.1.2 Constraints

Constraints are requirements imposed by an external organization. These are guidelines and specifications that set forth engineering requirements deemed necessary for safe design, construction, and operation of the RW/PW systems. The following constraints apply to the implementation of the alternatives:

- DOE Order 5820.2A *Radioactive Waste Management*
- DOE Order 5480.28 *Natural Phenomena Hazards Mitigation*
- RPP-PRO-097 *Engineering Design and Evaluation*
- WAC 173-303-640 *Dangerous Waste Regulations, Tank Systems*
- HNF-SD-WM-SAR-067 *Final Safety Analysis Report*
- HNF-SD-WM-TSR-006 *Technical Safety Requirements*
- HNF-5183 *Tank Farms Radiological Control Manual*
- RPP-PRO-1622 *Radiological Review Process*

5.1.3 Requirements

The SSTs are currently operating under interim status, pending closure. The following requirements apply to all remedial actions associated with eliminating the threat of leaking water lines. Every effort is being made to stem the flow of any surface water or pipeline flows from penetrating the soil column and driving contaminants deeper towards the aquifers. The pressurized water lines, active or inactive, present a significant threat. The following requirements are consistent with those considered for safe and efficient operation and maintenance of the tank farm facilities:

- Provide reliable cost-effective measures that will reduce or eliminate the amount of water entering the soil column.
- Identify the location of active and inactive water lines within the tank farm boundaries (within 500 ft of the SSTs). Record and document this information.
- Identify the current and future water needs for tank farm operations.
- Develop a plan for decommissioning unnecessary tank farm water lines.

5.2 DESCRIPTION OF TANK FARM WATER LINES

The physical condition of the 27 km (17 miles) of pressurized water lines is suspect and a cause of serious concern. Most of these water lines were installed during original tank farm construction, 30 to 55 years ago. Pipeline deterioration over time due to corrosion, pipeline settlement, and system operation such as water hammer, has weakened the system. The possibility of leaks underground going undetected is increasing. Photographs 1 and 2 show typical examples of tuberculation and corrosion damage in PW pipes from samples taken in 200 East area.

According to the water utility purveyor, it is estimated that approximately 4 major breaks per year will occur in the water lines in the 200 East and 200 West areas. Major water line breaks near the farm areas are a very real possibility and a serious risk to the vadose zone. Calls for repairs for underground leaks resulting from lead joint failures and pipeline wall failures are more frequently reported.

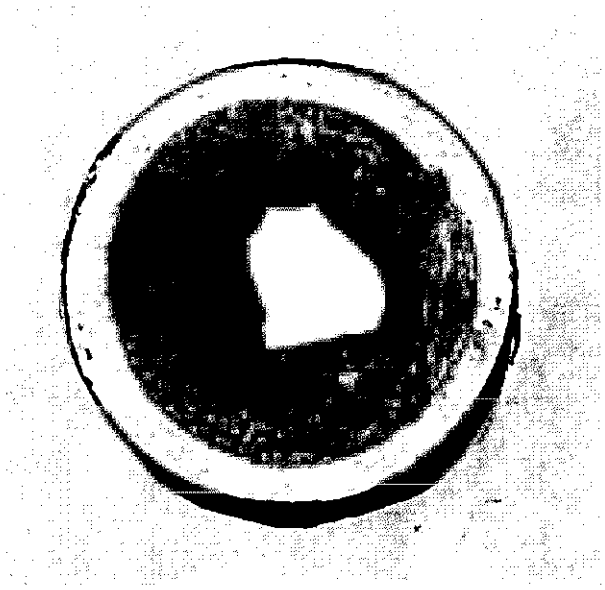

Photo 5-1

TUBERCULATION BUILDUP INSIDE POTABLE WATER LINE

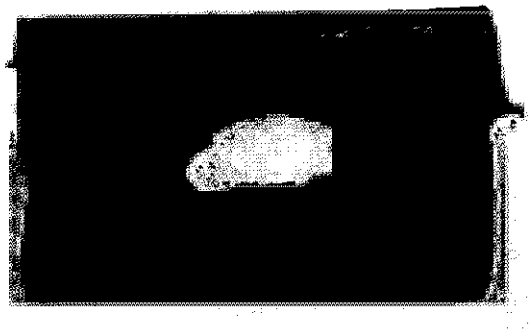

Photo 5-2

HOLE CORROSION-GALVANIZED WATER LINE

5.2.1 241-A Tank Farm

The six storage tanks have active RW/PW lines ranging in size from 1/2-to 8-in. The active 8-in. RW main line was installed in 1955 on the east side of A Tank Farm. An active 3-in. RW line passes by the west side of A Tank Farm without any branch lines coming into the farm area. There are two PW lines, one active the other inactive. The active 4-in. PW line serves the 242A Evaporator Building on the south side of the tank farm.

Within the farm area, there are approximately 3 500 m (11,500 ft) of active and inactive water lines ranging from 1/2-to 16-in. diameter (see ES-050051-C2, sh 1 and 2). The water lines represent only a small portion of all the pipelines and conduit buried within the A Farm area. The area is heavily congested with a variety of lines serving farm operations.

Of the six tanks, only Tank A-101 has not been interim stabilized (IS). Pumping of tank A-101 was initiated in May 2000. Under the TPA milestone, it is scheduled for completion by FY2003 (see Section 9.3.1). Therefore, RW supply will be required during this time for placing the saltwell screen system and jet pumping.

In a baseline report for SST retrieval (see Section 9.3.3), retrieval operations are not scheduled to begin until FY2004. The TPA retrieval completion milestone date for all SSTs is September 30, 2018, but the complete closure date for TPA Milestone M-45-00 is September 30, 2024. Therefore, RW will be required in support of TPA SST retrieval operations at least through FY2018, and possibly longer.

5.2.2 241-AX Tank Farm

An active 4-in. RW line delivers water to the four tanks in AX Tank Farm. The 4-in. line is fed by the same 8-in. RW line east of A and AX Tank Farms. There are no other active PW/RW lines directly supplying water to AX Tank Farm. Within the farm area, there are approximately 3 200 m (10,000 ft) of active and inactive pressure lines. The pipe sizes range in diameter from ½-to 8-in. (see ES-050051-C2, sh 1 and 3).

Only Tank AX-101 has not been IS. Pumping of Tank AX-101 was initiated in July 2000, with completion scheduled by FY2003. RW supply will be required during this time for placing the saltwell screen system and jet pumping. RW will also be required to support TPA SST retrieval operations.

5.2.3 241-B Tank Farm

The active water lines are on the east, west, and south sides of the B Farm. The active RW lines range from 2-to 6-in. diameter and the active PW lines range in diameter from 1-1/2-to 10-in. Approximately 3 000 m (9,800 ft) of active and inactive PW/RW lines are within the farm area. There are no PW lines around the tanks but there are two PW lines on the farm area perimeter. A 10-in. PW line is along the east side and a 4-in. PW line serves the 242-B Building to the southeast of B Tank Farm. (See ES-050051-C2, sh 4 and 5.)

The 16 SSTs in B Tank Farm are IS and intrusion prevention (IP) completed. There are no current water demands at B Tank Farm, with exception of TPA SST retrieval operations.

5.2.3 241-BX Tank Farm

There are no current water demands at BX Tank Farm. However, there are active water lines in the northeast corner: a capped 1-1/2 in. PW line and a 6-in. RW line; a 1-1/2 in. line to the 244-BX double-contained receiver tank on the southeast corner; and a 4-in. line serves the buildings along the southern boundary of the farm area (see ES-050051-C2, sh 4 and 6). Approximately 2 000 m (6,300 ft) of active and inactive PW/RW lines are within the farm area.

The 12 SSTs in BX Farm are all IS, IP, and controlled, clean and stable (CCS) completed. RW will be required to support TPA SST retrieval operations.

5.2.4 241-BY Tank Farm

There are 12 storage tanks in BY Tank Farm and no active water lines within the farm. The inactive lines range from 1/2- to 6-in. diameter. The nearest active line is at the southeast corner of the farm area in BX Tank Farm. The majority of all the lines within BY Tank Farm are RW lines. Approximately 1 960 m (6,400 ft) of water pipes are within the farm area (see ES-050051-C2, sh 4 and 7).

Of the 12 tanks, only tanks BY-105 and BY-106 have not been IS and under the TPA milestone, they are scheduled to start pumping in FY2001 with completion by FY2003. An RW supply will be required during this time for placing the saltwell screen assembly and jet pumping operations. Saltwell operations have proposed using a saltwell skid equipped with water tank storage in this application. RW will be required to support TPA SST retrieval operations.

5.2.6 241-C Tank Farm

There are 16 storage tanks in C-Tank Farm with active lines coming from the north and from the south. Along the northwest perimeter are three parallel active lines: a 6-in. RW, a 6-in. PW, and a 12-in RW. From the 12-in. RW main, running along the north/northwest boundary, a 1-in. RW line and two 4-in. chilled water lines (a supply and return line) serve Tank C-106. From the south perimeter, there are two lines (a 3-in. PW and a 4-in. RW) serving the 271-CR Building (see ES-050051-C2, sh 1 and 8). No other

active water lines are found in the farm area. Approximately 2 850 m (9,350 ft) of active and inactive water pipes ranging in size from 1/2-to 12-in. diameter are within the farm area.

Of the 16 tanks, only tank C-103 has not been IS. Under the TPA milestone, Tank C-103 is scheduled to start pumping in FY2002 with completion by FY2003. RW supply will be required over this time for placing the saltwell screen assembly and jet pumping operations. RW will be required to support TPA SST retrieval operations. Tank C-106 was sluiced and pumped under project W-320 and the Hanford Tanks Initiative (HTI) and is currently being evaluated for interim closure status. Project W-523 will utilize the water supply system upgraded by Project W-320 for the retrieval of waste from Tank C-104 in FY2008.

5.2.7 241-S Tank Farm

There are 12 storage tanks in S Farm. There are no active lines within the immediate fenced area, however, there are approximately 590 m (1,936 ft) of active lines within the affected tank farm area. Along the north boundary of the S and adjacent SY farm area is an active 14-in. RW line. A 4-in. PW line serves the 242-S Evaporator Building in the northwest corner of the tank farm. There are numerous active RW lines to the northeast, in and around SY Tank Farm. Approximately 2 300 m (7,400 ft) of inactive water lines, ranging from 3/4- to 14-in. diameter, are in the farm area (see ES-050051-C2, sh 9 and 10).

Seven of the 12 tanks, have not been IS. Of the 7, pumping has been initiated in 2, with the remaining 5 scheduled to start in FY2001 and FY2002. Under the TPA milestone, they are scheduled for completion by FY2003. RW will be required during this time for placing the saltwell screen system and jet pumping. RW will be required to support TPA SST retrieval operations.

5.2.8 241-SX Tank Farm

There are 15 storage tanks in SX Farm and no active water lines within the farm. Approximately 1 600 m (5,200 ft) of inactive RW pipes, ranging from 1/2-to 8-in. diameter, are within the farm area (see ES-050051-C2, sh 9 and 11).

Six of the 15 tanks have not been IS. Of the 6, pumping has been initiated in 3 tanks, with the remaining 3 scheduled to start in FY2001 and FY2002. Under the TPA milestone, they are scheduled for completion by FY2003. RW supply will be required during this time for placing the saltwell screen system and for jet pumping. RW will be required to support TPA SST retrieval operations.

5.2.9 241-T Tank Farm

There are no active water lines serving the 16 storage tanks in T Tank Farm. Approximately 1 200 m (3,800 ft) of inactive RW pipes ranging from 1- to 6-in. diameter are within the farm area (see ES-050051-C2, sh 12 and 13).

All 16 tanks have been IS. Of these, 11 are IP and 5 are partial interim status. RW will be required to support TPA SST retrieval operations.

5.2.10 241-TX Tank Farm

There is one active water line serving the 18 storage tanks: a 4-in. RW line (see ES-050051-C2, sh 12 and 14). Approximately 3 400 m (11,155 ft) of inactive water lines, ranging from 1/2- to 6-in. diameter, are within the farm area.

The 18 SST in TX Farm are all IS, IP and CCS. There are no current water demands at TX-Farm. RW will be required to support retrieval operations.

5.2.11 241-TY Tank Farm

There are no active water lines serving the 6 storage tanks. Approximately 740 m (2,400 ft) of inactive RW pipes, ranging from 1/2-to 6-in. diameter, are within the farm area. The closest active water line is in the southeast corner and that line serves the 244 TX

Double-Contained Receiver Tank and the 242-T Evaporator Building. (See ES-050051-C2, sh 12 and 15.)

The 6 SST in TY Tank Farm are IS, IP and CCS. There are no current water demands at TY Tank Farm. RW will be required to support retrieval operations.

5.2.12 241-U Tank Farm

At the south end, there is one 4-in. RW line serving the 16 storage tanks in U Tank Farm. Approximately 1 400 m (4,600 ft) of active and inactive water lines, ranging from 1-to 4-in. diameter, are within the farm area (see ES-050051-C2, sh 16 and 17).

Seven of the 16 tanks have not been IS. Of these 7, pumping has been initiated for 4, and the remaining 3 are scheduled to start in FY2002 and FY2003. Under the TPA milestone, they are scheduled for completion by FY2003. An RW supply will be required during this time for placing the saltwell screen system and jet pumping. RW will also be required in support of retrieval operations.

5.3 ALTERNATIVES CONSIDERED

Recommendations to mitigate water from entering the soil column from deteriorating water lines are developed in this study. Due to the age of buried piping system, the integrity of the existing pipes and pipe components is uncertain. Documented records that describe the status of the pipelines (whether active or inactive, and how and where the abandoned water lines were disconnected) are often incomplete or missing. The available information documenting the lines that have been cut and capped is vague and sometimes incomplete.

The following alternatives examine various methods to achieve the objectives of this study. The ultimate goal is to protect and preserve the quality of the groundwater by assuring that the existing lines will not contribute to contamination migration through the vadose zone.

5.3.1 Water Line Exploration

Water line exploration is an as-built verification activity. To meet the objectives of this study and to provide the appropriate corrective actions, the limits of the active versus

inactive lines must be confirmed. An action plan will need to be developed to perform exploratory excavations (or potholes) that will be focused on verifying the status of the water lines. The status of the water lines can be determined by flow tests using available aboveground fixtures such as, plumbing appurtenances, fire hydrants, and hose bibs. If simple flow tests cannot be used to determine the active or inactive status of a water line, a pipe tap can be installed. This can be accomplished by installing a small diameter saddle tee and corporation stop on the line. Ground-penetrating radar (GPR) surface scans and excavation permits will be required to perform the potholing activities when accessing the pipelines.

In addition, a study evaluating the active lines within the limits of the farm areas should be performed. It should specifically address the risk associated with leaving these lines in place and define the level of permissible risk acceptable when complying with the requirements of the WAC 173-303, *Dangerous Waste Regulations*. Pressure testing the existing lines prior to use and de-pressurizing the lines when not in use appears to be a sensible operational approach. However, many of the existing water lines are carbon steel, over 30 years old, and of questionable integrity. There may be some farm areas where the threat of a broken water line is an unreasonable or unacceptable risk. For this reason, FFS recommends that all active water lines within the farm area be capped and isolated as near to the service main as feasible.

The larger water mains that pass by or lie within the farm areas will need to be evaluated and a fitness-for-use determination made. The RW demands for each storage tank can be provided via water trucks, skid-mounted tanks with limited storage capacity, or from aboveground water lines that can be continuously monitored and removed when not in use. Some existing main lines that need to remain in use can be renovated by "slip-lining" or installation of a smaller diameter PVC sleeve inside the existing pipe.

As a final step in this activity, a set of H-2-XXXXX essential water line drawings should be created documenting each line. The drawings should be updated on a regular basis so that all future actions involving the water system can be easily monitored and controlled. As lines are abandoned, samples of the abandoned water line can be examined, and pipe

material and integrity identified and documented for future use during final tank farm closure activities. These essential drawings should be managed and updated by the appropriate agency.

5.3.2 Alternative 1: No Action

Alternative 1 acknowledges the existence of active and inactive RW/PW pipelines throughout the SST farms and only provides corrective maintenance if water line leaks are suspected or if increased contamination amounts are indicated from well monitoring activities. The operations/maintenance crews currently on site would perform repairs or pipeline removal on an as-needed basis. Alternative 1 does not provide a pro-active means to verify the location and assess the condition of the existing water lines. "No action" does not meet the objectives of this study, does not provide for corrective action as required by WAC 173-303, *Dangerous Waste Regulations,* and will not be evaluated in Section 6.0.

5.3.3 Alternative 2: Remove Water Lines

An action plan will be developed to systematically remove the active and inactive water lines within the farm areas. All active water mains within 500 feet of the SSTs will be tested for "fit for use." The active mains that are not fit for use will be removed, packaged if required, and disposed of with the inactive lines. Considering all the other buried service and utility lines within the farm area, this process will be very time consuming and labor intensive.

The lines will be prioritized within the individual SST farms and an action plan for pipe removal instituted to remove all known suspect pipes as soon as possible. Due to the congestion, the potential for contaminated soil, and load restrictions within the SST, it is assumed that all trench excavations will be hand-dug. GPR surface scanning will be required prior to excavating to identify underground lines and the appropriate excavation permits obtained. The mobilization costs can be minimized if the construction activity is limited to one farm area at a time.

The final activity will be to update the drawing files and as-built the affected drawings, or create a new set of essential water line drawings that will reflect the changes made.

5.3.4 Alternative 3: Water Lines Abandoned In Place

Alternative 3 is similar to Alternative 2, except all lines would be abandoned in place and not removed. An action plan would be developed to systematically go through each tank farm to cut and cap the lines at the connection points at the service main.

With positive isolation of the abandoned pipelines physically verified, the pipelines pose a minimal threat of transporting water into the soil column. Fit-for-use verification of the remaining active water lines will also ensure that mitigating measures are thorough in addressing every avenue for which water may be controlled.

The final activity will be to update the drawing files and as-built the affected drawings or create a new set of essential water line drawings that will reflect the changes being made. The "verified as-built" drawings will show the as-found locations of the water lines to the extent possible, all modifications made, and the active/inactive status of the water lines in the farm areas. Beyond cut/capping the water lines and documenting the work, no additional action would be taken. The abandoned lines would remain in place to be addressed at final tank farm closure.

5.3.5 Alternative 4: Grout-fill Abandoned Water Lines

In addition to the methods of Alternative 3, all abandoned water lines would be pressure-grouted and then abandoned in place. This additional activity will require vent piping at the end of the lines being grouted. Therefore, potholing at each end of each line will be required.

Alternative 4 adds one more level of assurance in providing a positive isolation of the pipelines. By grout filling the water lines, they would be physically incapable of transmitting any water. As previously mentioned, verified as-built drawings would be developed and the abandoned lines would remain in place to be addressed at final tank farm closure.

6.0 EVALUATION OF ALTERNATIVES

Based on the decision criteria, each alternative has been evaluated in an effort to establish the most viable option. The eleven decision criteria have been assigned a weight factor. This factor reflects its relative importance to other criteria in the decision-making process. A factor of 5 has the highest importance and 1 is the lowest as shown in Table 6-1. Appendix A provides a listing of the decision criteria and the associated weight factors.

Table 6-1

WEIGHT FACTOR

Importance	Weight Factor
0	1
Low/Medium	2
Medium	3
Medium/High	4
High	5

Within each tank farm and for each alternative, a score factor has been given for each decision criterion. Numerical scores from 0 to 5 reflect the estimated impact for an alternative for each decision criterion as shown in Table 6-2.

The numerical scores for impact are interpreted as follows: Does the activity have little or no impact on the importance factor? If it has no impact or does not adversely affect the importance, the score is "0." A score of 5 (heavy) indicates that performing the alternative has a heavy impact on the importance item or it will be detrimental to maintaining the importance item. For example: Radiation exposure is assigned a weight factor of 5 for importance. If an activity will cause little or no exposure, it may receive a "0" or "1," receiving a low multiplier score. However, if exposure were to be greatly increased as a result of the activity (less conservative mode) it may be a "4" or "5." Thus receiving a high score (5 for radiation exposure multiplied by 4 for radiation exposure results in a "20" score).

Table 6-2

IMPACT FACTOR

Impact	Score
None	0
Light	1
Light/Moderate	2
Moderate	3
Moderate/Heavy	4
Heavy	5

An alternative score multiplied by the importance weight factor determines its weighted score. This weighted score indicates how well the alternative performs. The higher the impact score, the less favorable the alternative.

There are considerable differences between the 12 tank farms, including the number of tanks, the condition of the tanks, the number of appurtenances exposed aboveground, etc. Appendix A includes a matrix that tabulates this information for each tank farm with the relative decision criteria versus alternatives.

6.1 ADVANTAGES AND DISADVANTAGES

Table 6-3 provides a comparison of advantages and disadvantages for the water line assessment.

Table 6-3

WATER LINE ASSESSMENT

ALTERNATIVE / COST	ADVANTAGES	DISADVANTAGES
1. No Action	Annual operation and maintenance costs are in current budget	Objectives of engineering study and TPA milestone not achieved
Water Line Exploration (Identify Active and Inactive Lines) Estimated cost: $195K	Provides required data for alternatives below	Required for Alternatives 2, 3, and 4
2. Remove Water Lines Estimated cost: $62.1M	Requires review of water distribution network in SST farms	Large contaminated waste volume for disposal
	Eliminates potential source of water to vadose zone	Extensive RCT coverage required
	Objectives of engineering study achieved	Long schedule
	Easy to prioritize work	May require confined space work
		Labor intensive
3. Water Lines Abandoned in Place Estimated cost: $648K	Objectives of engineering study achieved	Abandoned lines may provide flow path for liquid
	Easy to prioritize work	Water may remain in isolated lines
	Flexible	May require confined space work
	Easy work package preparation	RCT coverage may be required
	Small sections of pipe exposed at any one time	
4. Grout-fill Abandoned Water Lines Estimated cost: $1.20M	Same advantages as Alternative 3	Same disadvantages as Alternative 3
	Provides barrier to any errant liquid flow	Requires removal of residual water in lines
	Liquid pockets removed by grout	Increased labor for equipment and RCT coverage

6.2 PRINCIPAL HAZARDS AND RISKS

The potential hazards and risks associated with the alternatives are significantly minimized when the actions recommended are completed. Disconnecting and isolating the existing buried water lines from the farm areas will eliminate the threat of a bursting water line during an earthquake. It will also reduce the risk associated with human errors when handling water lines in the farm areas, either from careless practices or the accidental line breaks when excavating near pressure mains.

Common construction hazards will be present during the excavation and handling of the water lines. Industrial safety and health procedures will be implemented to ensure the work site is safely managed and maintained. And since the tank farms are known radiological areas, ALARA safety principles and procedures will be employed. Earthwork activities within the tank farm will require full-time HPT surveillance.

6.3 COST INFORMATION

Table 6-4 provides a summary of the cost information for each proposed alternative. The estimate in Appendix B considers the removal, capping and abandonment, or capping and grout filling of the currently inactive lines. The estimate does not address modifying the active lines currently in use.

Included in Table 6-4 is a cost for water line exploration, a common task for each alternative.

Revision 1 of this document revises the estimates to incorporate the most current site allocation factors and to reflect proposed changes in the method of work performance. During a detailed planning effort for a portion of the Run-on Control effort, it was determined that the costs previously provided were not adequate to address executing the work as addressed by the Statement of Work. Dividing the proposed work into numerous contracts (addressing farms individually rather than performing work as a single project addressing multiple farms) increases the proportional costs of engineering, engineering during construction, construction management, survey, and site plan development.

Additionally, Revision 1 updates the water line sketches and revises the pipe lengths in Table 6.4 to reflect the active/inactive status of lines based on the most current information. The estimates were reviewed to determine the impact of these status changes, and it was determined that the previous pipe length amounts were still appropriate for rough-order of magnitude cost-comparison purposes.

Table 6-4

WATERLINE ASSESSMENT ALTERNATIVE COSTS
($ x 1000)

TANK FARM	WATER LINE EXPLORATION ($x1000)	ACTIVE WATER LINES		INACTIVE WATER LINES		ALT 2 REMOVE PIPE ($x1000)	ALT 3 CUT, CAP, ABD. PIPE ($x1000)	ALT 4 GROUT PIPE ($x1000)
		M	Ft	M	Ft			
A	$ 26	2,289	7,508	1,220	4,002	$ 7,457	$ 88	$ 225
AX	$ 14	2,997	9,833	216	708	$ 6,711	$ 45	$ 76
B	$ 14	1,671	5,481	1,313	4,307	$ 8,078	$ 45	$ 68
BX	$ 14	704	2,309	1,229	4,031	$ 4,101	$ 45	$ 71
BY	$ 14	0	0	1,955	6,412	$ 4,661	$ 45	$ 68
C	$ 14	1,663	5,456	1,186	3,890	$ 4,785	$ 45	$ 68
S	$ 13	590	1,936	1,485	4,872	$ 3,791	$ 45	$ 145
SX	$ 27	0	0	1,585	5,199	$ 3,698	$ 91	$ 166
T	$ 13	0	0	1,162	3,811	$ 2,859	$ 45	$ 64
TX	$ 27	385	1,260	3,366	11,040	$10,191	$ 91	$ 153
TY	$ 5	0	0	740	2,427	$ 2,020	$ 18	$ 35
U	$ 14	448	1,469	949	3,113	$ 3,791	$ 45	$ 61
TOTAL	$195	10,747	35,252	16,406	53,812	$62,143	$648	$1,201

7.0 IDENTIFICATION OF PREFERRED ALTERNATIVE

7.1 PREFERRED ALTERNATIVE

Following the water line exploration activity, Alternative 3 is the preferred alternative to mitigate groundwater intrusion. Isolating all water lines within the farm area is the most positive and cost-effective method to ensure compliance with the constraints identified. Water will not leak into the soil column when the lines have been cut, capped, and abandoned in place. This activity will provide immediate corrective action.

Construction complications are less severe and exposure to radiation-controlled environments is kept to a minimum. The cost is also a significant reason to merit this method of action over the other alternatives. The objectives to mitigate groundwater intrusion from abandoned water lines are satisfied.

Future water demands for IS by saltwell operations will be inconvenienced by eliminating the use of existing buried water lines. Implementing a moratorium on the installation of new buried lines in the farm areas will create frustrations, but changes such as these must be made to satisfy the requirements of WAC 173-303. These steps will provide corrective actions that will show objective measures to, ". . protect human health, and the environment for all releases of dangerous wastes and dangerous constituents, . . " (WAC 173-303-646) due to the intrusion of leaking water lines. Furthermore, these water line restrictions will provide opportunities for innovative thinking and creative methods that can benefit the industry. Water trucks and a saltwell skid with a water tank mounted on it are already in use to facilitate IS activities.

The first recommendation is to evaluate the largest diameter pipe lines for fitness-for-use. These lines have the potential to spill the largest volume of water and threaten the vadose zone soil. The creation of essential drawings, from field verified records, controlled and managed by the water purveyor, will provide a useful tool for the future activities impacting the farm area water lines. Updated water line drawings will benefit all site organizations.

7.2 UNCERTAINTIES

The radiation levels during excavation will be dealt with as the work is underway. The RWP procedures will dictate the level of protective clothing, work procedures, method for handling and packaging contaminated soils and waste, etc., that will be required to perform the work in a safe manner. The cost for radiation work is difficult to estimate. Coordinating with HPTs familiar with the individual tank farms will provide a better estimate of the amount of radiation exposure at each farm and the potential for encountering contaminated soils. With this information, costs can be aligned more closely with what might be found in the field. Performing the cutting and capping of pressurized water lines at locations outside the tank farm fenced areas, where possible, will minimize potential radiation hazards.

There have been varying degrees of confidence in the existing documentation of the condition of existing pipelines, such as, whether or not they have been capped, are they isolated properly, and the location of pipe modifications. In many cases, the testimonials from those most familiar with the pipe systems do not agree with the as-built drawings or the recorded ECNs. There is some doubt about the reliability of existing ECN and work package documentation.

It was not in the scope of this study to consider the impact of other buried utility lines, i.e., gravity drain lines, waste lines, condensate lines, electrical conduits. These lines are also open conduits for water to travel to unwanted areas. The gravity lines most likely are directed away from the farm areas, but the instrumentation and electrical lines may not necessarily be constructed in that fashion.

8.0 REQUIRED MEASURES TO IMPLEMENT PREFERRED ALTERNATIVE

Discussions about future tank farm operations included consideration of the extension of new or reusing some existing water lines to serve the water needs for a few tank farms. Reusing 30 to 55 year old water lines and justifying their reuse by qualification through pneumatic or hydrostatic testing is contrary to TPA objectives. FFS does not recommend that these activities be permitted to continue because of the possibility of groundwater contamination. Plans to reuse these existing lines are contrary to the design objectives of this study. Any future projects

anticipating reuse or installing new buried water lines within the farm areas should be discouraged.

Future needs for water inside the tank farms should be limited to aboveground lines or water tank trucks that can be monitored continuously and removed following the activity. Water line mains that need to stay in service can be renovated by slip-lining or the installation of a smaller new pipe inside the line.

Project W-519 installed approximately 725 m (2,400 ft) of new 6-in. pipe, with construction completed in April 2000 as part of a system to provide potable water to the privatization site. This line was installed on the northwestern perimeter of C Farm, south of and parallel to an existing 12-in. RW line. Industry standard construction techniques and materials were specified which permitted minimal joint leakage. Water resulting from the hydrostatic testing of the line, and the discharge and disposal of flush water following the installation was handled in accordance with the Washington State Storm Water Permit ST4508 which does not allow release of water within 91 m (300 ft) of a subsurface contamination zone. Similarly, future projects need to develop construction policies to mitigate discharges into the farm areas from construction activity of this nature. The installation of future pressurized lines in the farm areas should be discouraged.

9.0 REFERENCES

9.1 INTERVIEWS

The following individuals were contributors of useful information for the preparation of this report. The specific information obtained was documented in trip reports placed in the project files.

DYNCORP - Water Purveyor	Doug Rohl, Mike Main
Water Operations	Tony McPherson, Ted Perry
& Maintenance	Robert Rasmussen, Pat Stanley, Tom Sweet
LMHC/CHG - SST Farm Engineering	Jeff Doeler, Lee Doughtery, Kevin Hull, Paul Kison

- Interim Stabilization	Jim Crawford, Mike Koch, Dave Saueressig, Steve Swaney, Dave Vladimiroff
- DST Farm Engineering	Dave Parkman, Gary Tardiff
- Saltwell Pumping Operations	Rebecca Raven

9.2 SKETCHES

See the reference block on the engineering sketches.

9.3 DOCUMENTS

9.3.1 Ecology, EPA, and DOE, 1996, *Hanford Federal Facility Agreement and Consent Order,* (Tri Party Agreement), Washington State Department of Ecology, US Environmental Protection Agency, and US Department of Energy, Olympia, Washington.

9.3.2 HNF-2358, Rev 3, *Single Shell Tank Interim Stabilization Project Plan,* by D. T. Vladimiroff, FDNW, January 1999.

9.3.3 HNF-2944, Rev 0, Single Shell Tank Retrieval Program Mission Analysis Report, by LMHC, July 1998.

9.3.4 HNF-EP-0182-134, *Waste Tank Summary Report for Month Ending May 31, 1999*, by FDH, Inc.

9.3.5 HNF-EP-0182-152, *Waste Tank Summary Report for Month Ending November 30, 2000*, by CHG, Inc.

9.3.6 Washington State Department of Ecology, *Hazardous Waste Management Act, (HWMA, Chapter 70.105 RCW)*

9.3.7 Washington State Department of Ecology *Dangerous Waste Regulations, (Chapter 173-303 WAC),* Publication 92-91, amended February 1998.

APPENDIX A

DECISION MATRIX

241-A FARM ALTERNATIVE EVALUATION
(6 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-AX FARM ALTERNATIVE EVALUATION
(4 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS 94.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	3/12
TOTAL WEIGHTED SCORE					**113**	**65**	**85**

241-B FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Minimum Congestion)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	4/16	3/12	4/16
TOTAL WEIGHTED SCORE					**109**	**65**	**89**

241-BX FARM ALTERNATIVE EVALUATION
(12 Tanks, Moderate Congestion)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-BY FARM ALTERNATIVE EVALUATION
(12 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-C FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Moderate Congestion)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-S FARM ALTERNATIVE EVALUATION
(12 Tanks, Moderate Congestion)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-SX FARM ALTERNATIVE EVALUATION
(15 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-T FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Minimal Congestion)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-TX FARM ALTERNATIVE EVALUATION
(18 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-TY FARM ALTERNATIVE EVALUATION
(6 Tanks, Minimal Congestion)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
egulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

241-U FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES			
Description			Weight Factor	1 No Action	2 Remove Pipe	3 Abandon Pipe	4 Grouted Pipe
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE			
			5	N/A	5/25	2/10	3/15
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)					
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)					
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	5/10	1/2	2/4
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	0/0	2/8	3/12
SCHEDULE (4.6)			3	N/A	5/15	1/3	3/9
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6
MAINTAINABILITY (4.8)			3	N/A	0/0	2/6	1/3
OPERABILITY (4.9)			2	N/A	N/A	N/A	N/A
CONSTRUCTIBILITY (4.10)			3	N/A	5/15	1/3	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16
TOTAL WEIGHTED SCORE					**113**	**65**	**89**

APPENDIX B

COST ESTIMATE

WATER LINE REMOVAL (FILE # SCH1).....I-B-1

WATER LINE CAPPING (FILE # SCF1).....I-B-39

WATER LINE GROUT & CAP (FILE #SCG1).....I-B-62

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCH1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

DATE 10/12/00 09:42:39
BY KLR/DLG

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	9,818,000	30	2,945,000	12,763,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	31,519,000	30	9,456,000	40,975,000
TOTAL ESTIMATED COST (TEC)		41,337,000	30	12,401,000	53,738,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	6,465,000	30	1,940,000	8,405,000
TOTAL OTHER PROJECT COSTS (OPC)		6,465,000	30	1,940,000	8,405,000
TOTAL PROJECT COST (TPC)		47,802,000	30	14,341,000	62,143,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/12/00

LEAD ESTIMATOR: DL GUNDERSON — ESTIMATING MANAGER: FC DAY

PROJECT MANAGER:

CLIENT:

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST * 1,000 / 10,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	4416473	778624	5195097	4.99	259235	5454332	30	1636299	7090632
SUBTOTAL 11	DEFINITIVE DESIGN	4416473	778624	5195097	4.99	259235	5454332	30	1636299	7090632
121100	ENGINEERING DURING CONSTRUCTION	3533178	622899	4156077	4.99	207388	4363465	30	1309039	5672505
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	3533178	622899	4156077	4.99	207388	4363465	30	1309039	5672505
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	9459	22959	4.99	1145	24104	30	7231	31336
320012	A-FARM REMOVE PIPES	2108340	1477259	3585599	4.99	178921	3764520	30	1129356	4893877
SUBTOTAL 32001	241-A FARM	2121840	1486718	3608558	4.99	180067	3788625	30	1136587	4925213
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320022	AX-FARM REMOVE PIPES	1903356	1333632	3236988	4.99	161525	3398514	30	1019554	4418068
SUBTOTAL 32002	241-AX FARM	1910356	1338537	3248893	4.99	162119	3411012	30	1023303	4434316
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320032	B-FARM REMOVE PIPES	2290158	1604654	3894812	4.99	194351	4089163	30	1226749	5315912
SUBTOTAL 32003	241-B FARM	2297158	1609559	3906717	4.99	194945	4101662	30	1230498	5332161
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320042	BX-FARM REMOVE PIPES	1151280	806672	1957952	4.99	97701	2055654	30	616696	2672350
SUBTOTAL 32004	241-BX FARM	1158280	811576	1969856	4.99	98295	2068152	30	620445	2688598
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320052	BY-FARM REMOVE PIPES	1317654	923246	2240900	4.99	111820	2352721	30	705816	3058537
SUBTOTAL 32005	241-BY FARM	1324654	928150	2252804	4.99	112414	2365219	30	709565	3074785
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
320062	C-FARM REMOVE PIPES	1351584	947020	2298604	4.99	114700	2413304	30	723991	3137295
SUBTOTAL 32006	241-C FARM	1358584	951924	2310508	4.99	115294	2425803	30	727740	3153544
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320072	S-FARM REMOVE PIPES	1072890	751746	1824636	4.99	91049	1915685	30	574705	2490391
SUBTOTAL 32007	241-S FARM	1079890	756651	1836541	4.99	91643	1928184	30	578455	2506639
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	9809	23809	4.99	1188	24997	30	7499	32496
320082	SX-FARM REMOVE PIPES	1036152	726004	1762156	4.99	87931	1850088	30	555026	2405115
SUBTOTAL 32008	241-SX FARM	1050152	735814	1785966	4.99	89119	1875086	30	562525	2437611
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320092	T-FARM REMOVE PIPES	802620	562375	1364995	4.99	68113	1433108	30	429932	1863040
SUBTOTAL 32009	241-T FARM	809620	567279	1376899	4.99	68707	1445607	30	433682	1879289
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	9809	23809	4.99	1188	24997	30	7499	32496
320102	TX-FARM REMOVE PIPES	2878200	2016680	4894880	4.99	244254	5139135	30	1541740	6680875
SUBTOTAL 32010	241-TX FARM	2892200	2026489	4918689	4.99	245442	5164132	30	1549239	6713372
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	1961	4761	4.99	237	4999	30	1499	6499
320112	TY-FARM REMOVE PIPES	567918	397925	965843	4.99	48195	1014039	30	304211	1318250
SUBTOTAL 32011	241-TY FARM	570718	399887	970605	4.99	48433	1019038	30	305711	1324750
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320122	U-FARM REMOVE PIPES	1072188	751254	1823442	4.99	90989	1914432	30	574329	2488761
SUBTOTAL 32012	241-U FARM	1079188	756159	1835347	4.99	91583	1926931	30	578079	2505010
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	17652640	12368749	30021389	4.99	1498067	31519456	30	9455837	40975293

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCH1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
ORDER OF MAGNITUDE
DOE_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

DATE 10/12/00 09:42:46
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)	5300000	858070	6158070	4.99	307287	6465357	30	1939607	8404965
PROJECT TOTAL		30,902,291	14,628,342	45,530,633	4.99	2,271,978	47,802,612	30	14,340,783	62,143,396

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND
ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 45.9% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========

A. *DEFINITION OF CONTINGENCY AS PROVIDED BY DOE*

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
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MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE CONTRACTOR.

B.) ALL EXCAVATION BY HAND. ASSUME 30% OF EXCAVATION AND ALL PIPE DISPOSED OF AS RAD WASTE.

C.) ALL WATERLINES ARE CONSIDERED TO NOT BE RADIOLOGICALLY CONTAMINATED INSIDE.

D.) ASSUME CUTTING AND CAPPING PIPE LOCATION IS OUTSIDE OF TANK FARMS.

E.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	4416473	778624	5195097	4.99	259235	5454332	30	1636299	7090632
121100	ENGINEERING DURING CONSTRUCTION	3533178	622899	4156077	4.99	207388	4363465	30	1309039	5672505
TOTAL 000	ENGINEERING	7949651	1401523	9351174	4.99	466623	9817798	30	2945339	12763137
460	IMPROVEMENTS TO LAND									
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	9459	22959	4.99	1145	24104	30	7231	31336
320012	A-FARM REMOVE PIPES	2108340	1477259	3585599	4.99	178921	3764520	30	1129356	4893877
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320022	AX-FARM REMOVE PIPES	1903356	1333632	3236988	4.99	161525	3398514	30	1019554	4418068
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320032	B-FARM REMOVE PIPES	2290158	1604654	3894812	4.99	194351	4089163	30	1226749	5315912
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320042	BX-FARM REMOVE PIPES	1151280	806672	1957952	4.99	97701	2055654	30	616696	2672350
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320052	BY-FARM REMOVE PIPES	1317654	923246	2240900	4.99	111820	2352721	30	705816	3058537
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320062	C-FARM REMOVE PIPES	1351584	947020	2298604	4.99	114700	2413304	30	723991	3137295
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320072	S-FARM REMOVE PIPES	1072890	751746	1824636	4.99	91049	1915685	30	574705	2490391
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	9809	23809	4.99	1188	24997	30	7499	32496
320082	SX-FARM REMOVE PIPES	1036152	726004	1762156	4.99	87931	1850088	30	555026	2405115
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320092	T-FARM REMOVE PIPES	802620	562375	1364995	4.99	68113	1433108	30	429932	1863040
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	9809	23809	4.99	1188	24997	30	7499	32496
320102	TX-FARM REMOVE PIPES	2878200	2016680	4894880	4.99	244254	5139135	30	1541740	6680875
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	1961	4761	4.99	237	4999	30	1499	6499
320112	TY-FARM REMOVE PIPES	567918	397925	965843	4.99	48195	1014039	30	304211	1318250
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	4904	11904	4.99	594	12498	30	3749	16248
320122	U-FARM REMOVE PIPES	1072188	751254	1823442	4.99	90989	1914432	30	574329	2488761
TOTAL 460	IMPROVEMENTS TO LAND	17652640	12368749	30021389	4.99	1498067	31519456	30	9455837	40975293
900	PROJECT SUPPORT									

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCH1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
ORDER OF MAGNITUDE
DOE_R04 - COST CODE ACCOUNT SUMMARY

DATE 10/12/00 09:42:53
BY KLR/DLG

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)	5300000	858070	6158070	4.99	307287	6465357	30	1939607	8404965
TOTAL 900	PROJECT SUPPORT	5300000	858070	6158070	4.99	307287	6465357	30	1939607	8404965
PROJECT TOTAL			14,628,342			2,271,978			14,340,783	
		30,902,291		45,530,633	4.99		47,802,612	30		62,143,396

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	7949651	1401523	9351174	4.99	466623	9817798	30	2945339	12763137
	TOTAL ENGINEERING		1,401,523			466,623			2,945,339	
		7,949,651		9,351,174	4.99		9,817,798	30		12,763,137
CONSTRUCTION										
07	SITE IMPROVEMENTS	17652640	12368749	30021389	4.99	1498067	31519456	30	9455837	40975293
99	OTHER COST AND FEES	5300000	858070	6158070	4.99	307287	6465357	30	1939607	8404965
	TOTAL CONSTRUCTION		13,226,819			1,805,355			11,395,444	
		22,952,640		36,179,459	4.99		37,984,814	30		49,380,258
	PROJECT TOTAL		14,628,342			2,271,978			14,340,783	
		30,902,291		45,530,633	4.99		47,802,612	30		62,143,396

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	4416473	0.00	0	11041	767583	778624
121100	ENGINEERING DURING CONSTRUCTION	3533178	0.00	0	8832	614066	622899
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	45.90	6196	0	3262	9459
320012	A-FARM REMOVE PIPES	2108340	45.90	967728	0	509531	1477259
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320022	AX-FARM REMOVE PIPES	1903356	45.90	873640	0	459992	1333632
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320032	B-FARM REMOVE PIPES	2290158	45.90	1051182	0	553472	1604654
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320042	BX-FARM REMOVE PIPES	1151280	45.90	528437	0	278234	806672
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320052	BY-FARM REMOVE PIPES	1317654	45.90	604803	0	318442	923246
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320062	C-FARM REMOVE PIPES	1351584	45.90	620377	0	326642	947020
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320072	S-FARM REMOVE PIPES	1072890	45.90	492456	0	259289	751746
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	45.90	6426	0	3383	9809
320082	SX-FARM REMOVE PIPES	1036152	45.90	475593	0	250411	726004
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320092	T-FARM REMOVE PIPES	802620	45.90	368402	0	193972	562375
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	45.90	6426	0	3383	9809
320102	TX-FARM REMOVE PIPES	2878200	45.90	1321093	0	695586	2016680
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	45.90	1285	0	676	1961
320112	TY-FARM REMOVE PIPES	567918	45.90	260674	0	137251	397925
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	45.90	3213	0	1691	4904
320122	U-FARM REMOVE PIPES	1072188	45.90	492134	0	259120	751254
500000	OPERATING CONTRACTOR (CHG)	5300000	0.00	0	0	858070	858070
PROJECT TOTAL		30,902,291		8,102,561	19,874	6,505,907	14,628,342

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCH1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
DATE 10/12/00 09:43:16
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 25% OF TOTAL CONSTRUCTION OF APPROX $17,660,000	000	50250 MHR	50250	4416473	0	0	0	0	0	4416473
SUBTOTAL	HOME OFFICE LABOR			50,250	4,416,473	0	0	0	0	0	4,416,473
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			50,250	4,416,473	0	0	0	0	0	4,416,473
TOTAL WBS 111100 DEFINITIVE DESIGN				50,250	4,416,473	0	0	0	0	0	4,416,473

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 20% OF TOTAL CONSTRUCTION OF APPROX $17,660,000	000	40200 MHR	40200	3533178	0	0	0	0	0	3533178
SUBTOTAL	HOME OFFICE LABOR			40,200	3,533,178	0	0	0	0	0	3,533,178
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			40,200	3,533,178	0	0	0	0	0	3,533,178
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				40,200	3,533,178	0	0	0	0	0	3,533,178

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320011	A-FARM EXPOSE PIPE, CUT AND CAP										
320011.07	SITE IMPROVEMENTS										
320011.0701002	********** 241-A FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320011.0701102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320011.0701104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320011.0701106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1000	0	0	1000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	13,500	0	0	13,500
TOTAL	COST CODE 46007 WBS 320011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	13,500	0	0	13,500
TOTAL WBS 320011 A-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	13,500	0	0	13,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320012	A-FARM REMOVE PIPES										
320012.07	SITE IMPROVEMENTS										
320012.0701002	********** 241-A FARM- REMOVE PIPES **********	460	0 EA	0	0	0	0	0	0	0	0
320012.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320012.0701104	ASSUME PIPE IS 42" DEEP. ASSUME 30% OF EXC AND ALL PIPE IS DISPOSED OF AS WASTE 1. EXCAVATE 1CY/LF@ $90/CY	460	9010 LF	0	0	0	0	2108340	0	0	2108340
320012.0701106	2. DISPOSE OF 30% OF EXC. AND ALL PIPE AS RAD WASTE- @ $446/CY(.3CY/LF)=$134/LF 3. BACKFILL @10/LF	460	0 LF	0	0	0	0	0	0	0	0
320012.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,108,340	0	0	2,108,340
TOTAL	COST CODE 46007 WBS 320012 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,108,340	0	0	2,108,340
TOTAL WBS 320012 A-FARM REMOVE PIPES				0	0	0	0	2,108,340	0	0	2,108,340

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320021	AX-FARM EXPOSE PIPE, CUT AND CAP										
320021.07	SITE IMPROVEMENTS										
320021.0702002	********** 241-AX FARM- EXCAVATE AND CUT PIPES **********	460	0 EA	0	0	0	0	0	0	0	0
320021.0702102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320021.0702104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320021.0702106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320021 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320021 AX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320022	AX-FARM REMOVE PIPES										
320022.07	SITE IMPROVEMENTS										
320022.0701002	********** 241-AX FARM- REMOVE PIPES **********	460	0 EA	0	0	0	0	0	0	0	0
320022.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320022.0701104	ASSUME PIPE IS 42" DEEP. ASSUME 30% OF EXC AND ALL PIPE IS DISPOSED OF AS WASTE 1. EXCAVATE 1CY/LF@ $90/CY	460	8134 LF	0	0	0	0	1903356	0	0	1903356
320022.0701106	2. DISPOSE OF 30% OF EXC. AND ALL PIPE AS RAD WASTE- @ $446/CY(.3CY/LF)=$134/LF 3. BACKFILL @10/LF	460	0 LF	0	0	0	0	0	0	0	0
320022.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	1,903,356	0	0	1,903,356
TOTAL	COST CODE 46007 WBS 320022 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	1,903,356	0	0	1,903,356
TOTAL WBS 320022 AX-FARM REMOVE PIPES				0	0	0	0	1,903,356	0	0	1,903,356

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320031	B-FARM EXPOSE PIPE, CUT AND CAP										
320031.07	SITE IMPROVEMENTS										
320031.0703002	********** 241-B FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320031.0703102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320031.0703104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320031.0703106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320031 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320031 B-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320032	B-FARM REMOVE PIPES										
320032.07	SITE IMPROVEMENTS										
320032.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-B FARM REMOVE PIPES										
	**********										
320032.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320032.0701104	ASSUME PIPE IS 42" DEEP.	460	9787 LF	0	0	0	0	2290158	0	0	2290158
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320032.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320032.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,290,158	0	0	2,290,158
TOTAL	COST CODE 46007			0	0	0	0	2,290,158	0	0	2,290,158
	WBS 320032 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320032 B-FARM REMOVE PIPES				0	0	0	0	2,290,158	0	0	2,290,158

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320041	BX-FARM EXPOSE PIPE, CUT AND CAP										
320041.07	SITE IMPROVEMENTS										
320041.0704002	********** 241-BX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320041.0704102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320041.0704104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320041.0704106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320041 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320041 BX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320042	BX-FARM REMOVE PIPES										
320042.07	SITE IMPROVEMENTS										
320042.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-BX FARM REMOVE PIPES										
	**********										
320042.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320042.0701104	ASSUME PIPE IS 42" DEEP.	460	4920 LF	0	0	0	0	1151280	0	0	1151280
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320042.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320042.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	1,151,280	0	0	1,151,280
TOTAL	COST CODE 46007			0	0	0	0	1,151,280	0	0	1,151,280
	WBS 320042 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320042 BX-FARM REMOVE PIPES				0	0	0	0	1,151,280	0	0	1,151,280

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320051	BY-FARM EXPOSE PIPE, CUT AND CAP										
320051.07	SITE IMPROVEMENTS										
320051.0705002	********** 241-BY FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320051.0705102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320051.0705104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320051.0705106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320051 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320051 BY-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320052	BY-FARM REMOVE PIPES										
320052.07	SITE IMPROVEMENTS										
320052.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-BY FARM REMOVE PIPES										
	**********										
320052.0701102	ESCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320052.0701104	ASSUME PIPE IS 42" DEEP.	460	5631 LF	0	0	0	0	1317654	0	0	1317654
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320052.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320052.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	1,317,654	0	0	0	1,317,654
TOTAL	COST CODE 46007			0	0	0	1,317,654	0	0	0	1,317,654
	WBS 320052 FDNW										
	(ESCALATION 4.99% - CONTINGENCY		30.00 %)								
TOTAL WBS 320052 BY-FARM REMOVE PIPES				0	0	0	1,317,654	0	0	0	1,317,654

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320061	C-FARM EXPOSE PIPE, CUT AND CAP										
320061.07	SITE IMPROVEMENTS										
320061.0706002	********** 241-C FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320061.0706102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320061.0706104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320061.0706106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320061 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320061 C-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320062	C-FARM REMOVE PIPES										
320062.07	SITE IMPROVEMENTS										
320062.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-C FARM REMOVE PIPES										
	**********										
320062.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320062.0701104	ASSUME PIPE IS 42" DEEP.	460	5776 LF	0	0	0	0	1351584	0	0	1351584
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320062.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320062.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	1,351,584	0	0	1,351,584
TOTAL	COST CODE 46007			0	0	0	0	1,351,584	0	0	1,351,584
	WBS 320062 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320062 C-FARM REMOVE PIPES				0	0	0	0	1,351,584	0	0	1,351,584

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320071	S-FARM EXPOSE PIPE, CUT AND CAP										
320071.07	SITE IMPROVEMENTS										
320071.0707002	********** 241-S FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320071.0707102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320071.0707104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320071.0707106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320071 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320071 S-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320072	S-FARM REMOVE PIPES										
320072.07	SITE IMPROVEMENTS										
320072.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-S FARM REMOVE PIPES										
	**********										
320072.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320072.0701104	ASSUME PIPE IS 42" DEEP.	460	4585 LF	0	0	0	0	1072890	0	0	1072890
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320072.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320072.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	1,072,890	0	0	1,072,890
TOTAL	COST CODE 46007			0	0	0	0	1,072,890	0	0	1,072,890
	WBS 320072 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320072 S-FARM REMOVE PIPES				0	0	0	0	1,072,890	0	0	1,072,890

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320081	SX-FARM EXPOSE PIPE, CUT AND CAP										
320081.07	SITE IMPROVEMENTS										
320081.0708002	********** 241-SX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320081.0708102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320081.0708104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320081.0708106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	14,000	0	0	14,000
TOTAL	COST CODE 46007 WBS 320081 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	14,000	0	0	14,000
TOTAL WBS 320081 SX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	14,000	0	0	14,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320082	SX-FARM REMOVE PIPES										
320082.07	SITE IMPROVEMENTS										
320082.0701002	********** 241-SX FARM REMOVE PIPES **********	460	0 EA	0	0	0	0	0	0	0	0
320082.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320082.0701104	ASSUME PIPE IS 42" DEEP. ASSUME 30% OF EXC AND ALL PIPE IS DISPOSED OF AS WASTE 1. EXCAVATE 1CY/LF@ $90/CY	460	4428 LF	0	0	0	0	1036152	0	0	1036152
320082.0701106	2. DISPOSE OF 30% OF EXC. AND ALL PIPE AS RAD WASTE- @ $446/CY(.3CY/LF)=$134/LF 3. BACKFILL @10/LF	460	0 LF	0	0	0	0	0	0	0	0
320082.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	1,036,152	0	0	1,036,152
TOTAL	COST CODE 46007			0	0	0	0	1,036,152	0	0	1,036,152
	WBS 320082 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320082 SX-FARM REMOVE PIPES				0	0	0	0	1,036,152	0	0	1,036,152

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320091	T-FARM EXPOSE PIPE, CUT AND CAP										
320091.07	SITE IMPROVEMENTS										
320091.0709002	********** 241-T FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320091.0709102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320091.0709104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320091.0709106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320091 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320091 T-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320092	T-FARM REMOVE PIPES										
320092.07	SITE IMPROVEMENTS										
320092.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-T FARM REMOVE PIPES										
	**********										
320092.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320092.0701104	ASSUME PIPE IS 42" DEEP.	460	3430 LF	0	0	0	0	802620	0	0	802620
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320092.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320092.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	802,620	0	0	802,620
TOTAL	COST CODE 46007			0	0	0	0	802,620	0	0	802,620
	WBS 320092 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320092 T-FARM REMOVE PIPES				0	0	0	0	802,620	0	0	802,620

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320101	TX-FARM EXPOSE PIPE, CUT AND CAP										
320101.07	SITE IMPROVEMENTS										
320101.070A002	********** 241-TX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320101.070A102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320101.070A104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320101.070A106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	14,000	0	0	14,000
TOTAL	COST CODE 46007 WBS 320101 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	14,000	0	0	14,000
TOTAL WBS 320101 TX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	14,000	0	0	14,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320102	TX-FARM REMOVE PIPES										
320102.07	SITE IMPROVEMENTS										
320102.0701002	********** 241-TX FARM REMOVE PIPES **********	460	0 EA	0	0	0	0	0	0	0	0
320102.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320102.0701104	ASSUME PIPE IS 42" DEEP. ASSUME 30% OF EXC AND ALL PIPE IS DISPOSED OF AS WASTE 1. EXCAVATE 1CY/LF@ $90/CY	460	12300 LF	0	0	0	0	2878200	0	0	2878200
320102.0701106	2. DISPOSE OF 30% OF EXC. AND ALL PIPE AS RAD WASTE- @ $446/CY(.3CY/LF)=$134/LF 3. BACKFILL @10/LF	460	0 LF	0	0	0	0	0	0	0	0
320102.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,878,200	0	0	2,878,200
TOTAL	COST CODE 46007 WBS 320102 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,878,200	0	0	2,878,200
TOTAL WBS 320102 TX-FARM REMOVE PIPES				0	0	0	0	2,878,200	0	0	2,878,200

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320111	TY-FARM EXPOSE PIPE, CUT AND CAP										
320111.07	SITE IMPROVEMENTS										
320111.070B002	********** 241-TY FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320111.070B102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	2 EA	0	0	0	0	2000	0	0	2000
320111.070B104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	2 EA	0	0	0	0	500	0	0	500
320111.070B106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	2 EA	0	0	0	0	300	0	0	300
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,800	0	0	2,800
TOTAL	COST CODE 46007 WBS 320111 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,800	0	0	2,800
TOTAL WBS 320111 TY-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	2,800	0	0	2,800

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320112	TY-FARM REMOVE PIPES										
320112.07	SITE IMPROVEMENTS										
320112.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-TY FARM REMOVE PIPES										
	**********										
320112.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320112.0701104	ASSUME PIPE IS 42" DEEP.	460	2427 LF	0	0	0	0	567918	0	0	567918
	ASSUME 30% OF EXC AND ALL										
	PIPE IS DISPOSED OF AS WASTE										
	1. EXCAVATE 1CY/LF@ $90/CY										
320112.0701106	2. DISPOSE OF 30% OF EXC.	460	0 LF	0	0	0	0	0	0	0	0
	AND ALL PIPE AS RAD WASTE-										
	@ $446/CY(.3CY/LF)=$134/LF										
	3. BACKFILL @10/LF										
320112.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	567,918	0	0	567,918
TOTAL	COST CODE 46007			0	0	0	0	567,918	0	0	567,918
	WBS 320112 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320112 TY-FARM REMOVE PIPES				0	0	0	0	567,918	0	0	567,918

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320121	U-FARM EXPOSE PIPE, CUT AND CAP										
320121.07	SITE IMPROVEMENTS										
320121.070C002	********** 241-U FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320121.070C102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320121.070C104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320121.070C106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320121 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320121 U-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320122	U-FARM REMOVE PIPES										
320122.07	SITE IMPROVEMENTS										
320122.0701002	********** 241-U FARM REMOVE PIPES **********	460	0 EA	0	0	0	0	0	0	0	0
320122.0701102	EXCAVATE PIPES IN TANK FARM-	460	0 CY	0	0	0	0	0	0	0	0
320122.0701104	ASSUME PIPE IS 42" DEEP. ASSUME 30% OF EXC AND ALL PIPE IS DISPOSED OF AS WASTE 1. EXCAVATE 1CY/LF@ $90/CY	460	4582 LF	0	0	0	0	1072188	0	0	1072188
320122.0701106	2. DISPOSE OF 30% OF EXC. AND ALL PIPE AS RAD WASTE- @ $446/CY(.3CY/LF)=$134/LF 3. BACKFILL @10/LF	460	0 LF	0	0	0	0	0	0	0	0
320122.0701108	TOTAL COST/LF- $234/LF	460	0 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	1,072,188	0	0	0	1,072,188
TOTAL	COST CODE 46007 WBS 320122 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	1,072,188	0	0	0	1,072,188
TOTAL WBS 320122 U-FARM REMOVE PIPES				0	0	0	1,072,188	0	0	0	1,072,188

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX. $17660000	900	1 LS	0	0	0	0	5300000	0	0	5300000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	5,300,000	0	0	5,300,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	5,300,000	0	0	5,300,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	5,300,000	0	0	5,300,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				90,450		0	22,952,640				0
					7,949,651		0		0		30,902,291

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	251,000	30	75,000	326,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	211,000	30	63,000	274,000
TOTAL ESTIMATED COST (TEC)		462,000	30	138,000	600,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	37,000	30	11,000	48,000
TOTAL OTHER PROJECT COSTS (OPC)		37,000	30	11,000	48,000
TOTAL PROJECT COST (TPC)		499,000	30	149,000	648,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/12/00

LEAD ESTIMATOR: DL GUNDERSON ESTIMATING MANAGER: FC DAY

PROJECT MANAGER

CLIENT

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCF1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
ORDER OF MAGNITUDE
DOE_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

DATE 10/12/00 10:12:16
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	168749	29750	198499	4.99	9905	208404	30	62521	270925
SUBTOTAL 11	DEFINITIVE DESIGN	168749	29750	198499	4.99	9905	208404	30	62521	270925
121100	ENGINEERING DURING CONSTRUCTION	34277	6043	40320	4.99	2011	42332	30	12699	55031
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	34277	6043	40320	4.99	2011	42332	30	12699	55031
320001	A-FARM EXPOSE PIPE, CUT AND CAP	13500	13594	27094	4.99	1352	28447	30	8534	36981
320002	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320003	B-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320006	C-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320007	S-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320009	T-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	2819	5619	4.99	280	5900	30	1770	7670
320012	U-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	100300	101005	201305	4.99	10045	211350	30	63405	274756
500000	OPERATING CONTRACTOR (CHG)	30000	4857	34857	4.99	1739	36596	30	10978	47575
PROJECT TOTAL		333,326	141,656	474,982	4.99	23,701	498,683	30	149,605	648,288

1. ESTIMATE PURPOSE

PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS

A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY

A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 72% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR:
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT. 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING. 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION

ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
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A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
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MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE CONTRACTOR.

B.) ALL EXCAVATION BY HAND AND PERFORMED OUTSIDE OF THE TANK FARM.

C.) ALL WATERLINES ARE CONSIDERED TO NOT BE RADIOLOGICALLY CONTAMINATED.

D.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	168749	29750	198499	4.99	9905	208404	30	62521	270925
121100	ENGINEERING DURING CONSTRUCTION	34277	6043	40320	4.99	2011	42332	30	12699	55031
TOTAL 000	ENGINEERING	203026	35793	238819	4.99	11917	250736	30	75220	325957
460	IMPROVEMENTS TO LAND									
320001	A-FARM EXPOSE PIPE, CUT AND CAP	13500	13594	27094	4.99	1352	28447	30	8534	36981
320002	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320003	B-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320006	C-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320007	S-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320009	T-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	2819	5619	4.99	280	5900	30	1770	7670
320012	U-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
TOTAL 460	IMPROVEMENTS TO LAND	100300	101005	201305	4.99	10045	211350	30	63405	274756
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	30000	4857	34857	4.99	1739	36596	30	10978	47575
TOTAL 900	PROJECT SUPPORT	30000	4857	34857	4.99	1739	36596	30	10978	47575
PROJECT TOTAL			141,656			23,701			149,605	
		333,326		474,982	4.99		498,683	30		648,288

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	203026	35793	238819	4.99	11917	250736	30	75220	325957
	TOTAL ENGINEERING		35,793			11,917			75,220	
		203,026		238,819	4.99		250,736	30		325,957
CONSTRUCTION										
07	SITE IMPROVEMENTS	100300	101005	201305	4.99	10045	211350	30	63405	274756
99	OTHER COST AND FEES	30000	4857	34857	4.99	1739	36596	30	10978	47575
	TOTAL CONSTRUCTION		105,862			11,784			74,384	
		130,300		236,162	4.99		247,947	30		322,331
	PROJECT TOTAL		141,656			23,701			149,605	
		333,326		474,982	4.99		498,683	30		648,288

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCF1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
ORDER OF MAGNITUDE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

DATE 10/12/00 10:12:37
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	168749	0.00	0	421	29328	29750
121100	ENGINEERING DURING CONSTRUCTION	34277	0.00	0	85	5957	6043
320001	A-FARM EXPOSE PIPE, CUT AND CAP	13500	72.00	9720	0	3874	13594
320002	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320003	B-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320006	C-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320007	S-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	72.00	10080	0	4018	14098
320009	T-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	72.00	10080	0	4018	14098
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	72.00	2016	0	803	2819
320012	U-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
500000	OPERATING CONTRACTOR (CHG)	30000	0.00	0	0	4857	4857
PROJECT TOTAL		333,326		72,216	507	68,932	141,656

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCF1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
DATE 10/12/00 10:12:44
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 168% OF TOTAL CONSTRUCTION OF APPROX. $100,300	000	1920 MHR	1920	168749	0	0	0	0	0	168749
SUBTOTAL	HOME OFFICE LABOR			1,920	168,749	0	0	0	0	0	168,749
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			1,920	168,749	0	0	0	0	0	168,749
TOTAL WBS 111100 DEFINITIVE DESIGN				1,920	168,749	0	0	0	0	0	168,749

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 34% OF TOTAL CONSTRUCTION OF APPROX $100,300.	000	390 MHR	390	34277	0	0	0	0	0	34277
SUBTOTAL	HOME OFFICE LABOR			390	34,277	0	0	0	0	0	34,277
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			390	34,277	0	0	0	0	0	34,277
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				390	34,277	0	0	0	0	0	34,277

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320001	A-FARM EXPOSE PIPE, CUT AND CAP										
320001.07	SITE IMPROVEMENTS										
320001.0701002	********** 241-A FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320001.0701102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320001.0701104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320001.0701106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1000	0	0	1000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	13,500	0	0	13,500
TOTAL	COST CODE 46007 WBS 320001 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	13,500	0	0	13,500
TOTAL WBS 320001 A-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	13,500	0	0	13,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002	AX-FARM EXPOSE PIPE, CUT AND CAP										
320002.07	SITE IMPROVEMENTS										
320002.0702002	********** 241-AX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320002.0702102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320002.0702104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320002.0702106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320002 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320002 AX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003	B-FARM EXPOSE PIPE, CUT AND CAP										
320003.07	SITE IMPROVEMENTS										
320003.0703002	********** 241-B FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320003.0703102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320003.0703104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320003.0703106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320003 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320003 B-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320004	BX-FARM EXPOSE PIPE, CUT AND CAP										
320004.07	SITE IMPROVEMENTS										
320004.0704002	********** 241-BX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320004.0704102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320004.0704104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320004.0704106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320004 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320004 BX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320005	BY-FARM EXPOSE PIPE, CUT AND CAP										
320005.07	SITE IMPROVEMENTS										
320005.0705002	********** 241-BY FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320005.0705102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320005.0705104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320005.0705106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320005 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320005 BY-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320006	C-FARM EXPOSE PIPE, CUT AND CAP										
320006.07	SITE IMPROVEMENTS										
320006.0706002	********** 241-C FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320006.0706102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320006.0706104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320006.0706106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320006 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320006 C-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320007	S-FARM EXPOSE PIPE, CUT AND CAP										
320007.07	SITE IMPROVEMENTS										
320007.0707002	********** 241-S FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320007.0707102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320007.0707104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320007.0707106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320007 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320007 S-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320008	SX-FARM EXPOSE PIPE, CUT AND CAP										
320008.07	SITE IMPROVEMENTS										
320008.0708002	********** 241-SX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320008.0708102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320008.0708104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320008.0708106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	14,000	0	0	14,000
TOTAL	COST CODE 46007 WBS 320008 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	14,000	0	0	14,000
TOTAL WBS 320008 SX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	14,000	0	0	14,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320009	T-FARM EXPOSE PIPE, CUT AND CAP										
320009.07	SITE IMPROVEMENTS										
320009.0709002	********** 241-T FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320009.0709102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320009.0709104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320009.0709106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320009 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320009 T-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320010	TX-FARM EXPOSE PIPE, CUT AND CAP										
320010.07	SITE IMPROVEMENTS										
320010.070A002	********** 241-TX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320010.070A102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320010.070A104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320010.070A106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	14,000	0	0	14,000
TOTAL	COST CODE 46007 WBS 320010 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	14,000	0	0	14,000
TOTAL WBS 320010 TX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	14,000	0	0	14,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320011	TY-FARM EXPOSE PIPE, CUT AND CAP										
320011.07	SITE IMPROVEMENTS										
320011.070B002	********** 241-TY FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320011.070B102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	2 EA	0	0	0	0	2000	0	0	2000
320011.070B104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	2 EA	0	0	0	0	500	0	0	500
320011.070B106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	2 EA	0	0	0	0	300	0	0	300
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,800	0	0	2,800
TOTAL	COST CODE 46007 WBS 320011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,800	0	0	2,800
TOTAL WBS 320011 TY-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	2,800	0	0	2,800

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320012	U-FARM EXPOSE PIPE, CUT AND CAP										
320012.07	SITE IMPROVEMENTS										
320012.070C002	********** 241-U FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320012.070C102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320012.070C104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320012.070C106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320012 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320012 U-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX. $100,000	900	1 LS	0	0	0	0	30000	0	0	30000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	30,000	0	0	30,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	30,000	0	0	30,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	30,000	0	0	30,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				2,310	203,026	0	0	130,300	0	0	333,326

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	464,000	30	139,000	603,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	392,000	30	118,000	510,000
TOTAL ESTIMATED COST (TEC)		856,000	30	257,000	1,113,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	68,000	30	20,000	88,000
TOTAL OTHER PROJECT COSTS (OPC)		68,000	30	20,000	88,000
TOTAL PROJECT COST (TPC)		924,000	30	277,000	1,201,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/12/00

LEAD ESTIMATOR: DL GUNDERSON — ESTIMATING MANAGER: FC DAY

PROJECT MANAGER:

CLIENT:

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	312449	55084	367533	4.99	18339	385873	30	115762	501635
SUBTOTAL 11	DEFINITIVE DESIGN	312449	55084	367533	4.99	18339	385873	30	115762	501635
121100	ENGINEERING DURING CONSTRUCTION	63281	11156	74437	4.99	3714	78151	30	23445	101597
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	63281	11156	74437	4.99	3714	78151	30	23445	101597
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	13594	27094	4.99	1352	28447	30	8534	36981
320012	A-FARM GROUT PIPES	21360	21510	42870	4.99	2139	45009	30	13502	58512
SUBTOTAL 32001	241-A FARM	34860	35105	69965	4.99	3491	73456	30	22036	95493
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320022	AX-FARM GROUT PIPES	4800	4833	9633	4.99	480	10114	30	3034	13148
SUBTOTAL 32002	241-AX FARM	11800	11883	23683	4.99	1181	24864	30	7459	32324
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320032	B-FARM GROUT PIPES	3600	3625	7225	4.99	360	7585	30	2275	9861
SUBTOTAL 32003	241-B FARM	10600	10674	21274	4.99	1061	22336	30	6700	29037
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320042	BX-FARM GROUT PIPES	4080	4108	8188	4.99	408	8597	30	2579	11176
SUBTOTAL 32004	241-BX FARM	11080	11157	22237	4.99	1109	23347	30	7004	30351
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320052	BY-FARM GROUT PIPES	3600	3625	7225	4.99	360	7585	30	2275	9861
SUBTOTAL 32005	241-BY FARM	10600	10674	21274	4.99	1061	22336	30	6700	29037
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
320062	C-FARM GROUT PIPES	3600	3625	7225	4.99	360	7585	30	2275	9861
SUBTOTAL 32006	241-C FARM	10600	10674	21274	4.99	1061	22336	30	6700	29037
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320072	S-FARM GROUT PIPES	15600	15709	31309	4.99	1562	32872	30	9861	42733
SUBTOTAL 32007	241-S FARM	22600	22759	45359	4.99	2263	47622	30	14286	61909
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320082	SX-FARM GROUT PIPES	11760	11842	23602	4.99	1177	24780	30	7434	32214
SUBTOTAL 32008	241-SX FARM	25760	25941	51701	4.99	2579	54281	30	16284	70565
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320092	T-FARM GROUT PIPES	2880	2900	5780	4.99	288	6068	30	1820	7889
SUBTOTAL 32009	241-T FARM	9880	9949	19829	4.99	989	20819	30	6245	27064
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320102	TX-FARM GROUT PIPES	9600	9667	19267	4.99	961	20229	30	6068	26297
SUBTOTAL 32010	241-TX FARM	23600	23766	47366	4.99	2363	49729	30	14918	64648
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	2819	5619	4.99	280	5900	30	1770	7670
320112	TY-FARM GROUT PIPES	2640	2658	5298	4.99	264	5562	30	1668	7231
SUBTOTAL 32011	241-TY FARM	5440	5478	10918	4.99	544	11463	30	3438	14902
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320122	U-FARM GROUT PIPES	2400	2416	4816	4.99	240	5057	30	1517	6574
SUBTOTAL 32012	241-U FARM	9400	9466	18866	4.99	941	19807	30	5942	25749
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	186220	187530	373750	4.99	18650	392400	30	117720	510120

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCG1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
DOE_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

DATE 10/12/00 10:31:31
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)	56000	9066	65066	4.99	3246	68313	30	20493	88807
PROJECT TOTAL		617,950	262,837	880,787	4.99	43,951	924,739	30	277,421	1,202,160

1. ESTIMATE PURPOSE
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PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 72% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002

5. CONTINGENCY
==========

A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
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MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE CONTRACTOR.

B.) ALL EXCAVATION BY HAND AND PERFORMED OUTSIDE OF THE TANK FARM.

C.) ALL WATERLINES ARE CONSIDERED TO NOT BE RADIOLOGICALLY CONTAMINATED.

D.) ASSUME CUTTING AND CAPPING PIPE AND GROUT INSERTION LOCATION ARE OUTSIDE OF TANK FARMS.

E.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	312449	55084	367533	4.99	18339	385873	30	115762	501635
121100	ENGINEERING DURING CONSTRUCTION	63281	11156	74437	4.99	3714	78151	30	23445	101597
TOTAL 000	ENGINEERING	375730	66241	441971	4.99	22054	464025	30	139207	603233
460	IMPROVEMENTS TO LAND									
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	13594	27094	4.99	1352	28447	30	8534	36981
320012	A-FARM GROUT PIPES	21360	21510	42870	4.99	2139	45009	30	13502	58512
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320022	AX-FARM GROUT PIPES	4800	4833	9633	4.99	480	10114	30	3034	13148
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320032	B-FARM GROUT PIPES	3600	3625	7225	4.99	360	7585	30	2275	9861
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320042	BX-FARM GROUT PIPES	4080	4108	8188	4.99	408	8597	30	2579	11176
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320052	BY-FARM GROUT PIPES	3600	3625	7225	4.99	360	7585	30	2275	9861
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320062	C-FARM GROUT PIPES	3600	3625	7225	4.99	360	7585	30	2275	9861
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320072	S-FARM GROUT PIPES	15600	15709	31309	4.99	1562	32872	30	9861	42733
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320082	SX-FARM GROUT PIPES	11760	11842	23602	4.99	1177	24780	30	7434	32214
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320092	T-FARM GROUT PIPES	2880	2900	5780	4.99	288	6068	30	1820	7889
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	14098	28098	4.99	1402	29500	30	8850	38350
320102	TX-FARM GROUT PIPES	9600	9667	19267	4.99	961	20229	30	6068	26297
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	2819	5619	4.99	280	5900	30	1770	7670
320112	TY-FARM GROUT PIPES	2640	2658	5298	4.99	264	5562	30	1668	7231
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	7049	14049	4.99	701	14750	30	4425	19175
320122	U-FARM GROUT PIPES	2400	2416	4816	4.99	240	5057	30	1517	6574
TOTAL 460	IMPROVEMENTS TO LAND	186220	187530	373750	4.99	18650	392400	30	117720	510120
900	PROJECT SUPPORT									

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCG1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
DOE_R04 - COST CODE ACCOUNT SUMMARY

DATE 10/12/00 10:31:38
BY KLR/DLG

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)	56000	9066	65066	4.99	3246	68313	30	20493	88807
TOTAL 900	PROJECT SUPPORT	56000	9066	65066	4.99	3246	68313	30	20493	88807
PROJECT TOTAL		617,950	262,837	880,787	4.99	43,951	924,739	30	277,421	1,202,160

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	375730	66241	441971	4.99	22054	464025	30	139207	603233
	TOTAL ENGINEERING	375,730	66,241	441,971	4.99	22,054	464,025	30	139,207	603,233
CONSTRUCTION										
07	SITE IMPROVEMENTS	186220	187530	373750	4.99	18650	392400	30	117720	510120
99	OTHER COST AND FEES	56000	9066	65066	4.99	3246	68313	30	20493	88807
	TOTAL CONSTRUCTION	242,220	196,596	438,816	4.99	21,896	460,713	30	138,214	598,927
	PROJECT TOTAL	617,950	262,837	880,787	4.99	43,951	924,739	30	277,421	1,202,160

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	312449	0.00	0	781	54303	55084
121100	ENGINEERING DURING CONSTRUCTION	63281	0.00	0	158	10998	11156
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	72.00	9720	0	3874	13594
320012	A-FARM GROUT PIPES	21360	72.00	15379	0	6131	21510
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320022	AX-FARM GROUT PIPES	4800	72.00	3456	0	1377	4833
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320032	B-FARM GROUT PIPES	3600	72.00	2592	0	1033	3625
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320042	BX-FARM GROUT PIPES	4080	72.00	2937	0	1171	4108
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320052	BY-FARM GROUT PIPES	3600	72.00	2592	0	1033	3625
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320062	C-FARM GROUT PIPES	3600	72.00	2592	0	1033	3625
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320072	S-FARM GROUT PIPES	15600	72.00	11232	0	4477	15709
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	72.00	10080	0	4018	14098
320082	SX-FARM GROUT PIPES	11760	72.00	8467	0	3375	11842
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320092	T-FARM GROUT PIPES	2880	72.00	2073	0	826	2900
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	72.00	10080	0	4018	14098
320102	TX-FARM GROUT PIPES	9600	72.00	6912	0	2755	9667
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	72.00	2016	0	803	2819
320112	TY-FARM GROUT PIPES	2640	72.00	1900	0	757	2658
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	72.00	5040	0	2009	7049
320122	U-FARM GROUT PIPES	2400	72.00	1728	0	688	2416
500000	OPERATING CONTRACTOR (CHG)	56000	0.00	0	0	9066	9066
PROJECT TOTAL		617,950		134,078	939	127,820	262,837

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCG1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
DATE 10/12/00 10:32:00
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 168% OF TOTAL CONSTRUCTION OF APPROX $186,000.	000	3555 MHR	3555	312449	0	0	0	0	0	312449
SUBTOTAL	HOME OFFICE LABOR			3,555	312,449	0	0	0	0	0	312,449
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			3,555	312,449	0	0	0	0	0	312,449
TOTAL WBS 111100 DEFINITIVE DESIGN				3,555	312,449	0	0	0	0	0	312,449

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 34% OF TOTAL CONSTRUCTION OF APPROX $186,000.	000	720 MHR	720	63281	0	0	0	0	0	63281
SUBTOTAL	HOME OFFICE LABOR			720	63,281	0	0	0	0	0	63,281
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			720	63,281	0	0	0	0	0	63,281
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				720	63,281	0	0	0	0	0	63,281

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320011	A-FARM EXPOSE PIPE, CUT AND CAP										
320011.07	SITE IMPROVEMENTS										
320011.0701002	********** 241-A FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320011.0701102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320011.0701104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320011.0701106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1000	0	0	1000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	13,500	0	0	13,500
TOTAL	COST CODE 46007 WBS 320011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	13,500	0	0	13,500
TOTAL WBS 320011 A-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	13,500	0	0	13,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320012	A-FARM GROUT PIPES										
320012.07	SITE IMPROVEMENTS										
320012.0701002	********** 241-A FARM- GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320012.0701102	GROUT PIPES IN TANK FARM- 2"- 3800', 4"- 3320', 8"- 660', 10"- 100', 16"- 1100'	460	0 CY	0	0	0	0	0	0	0	0
320012.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	89 CY	0	0	0	0	21360	0	0	21360
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	21,360	0	0	21,360
TOTAL	COST CODE 46007 WBS 320012 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	21,360	0	0	21,360
TOTAL WBS 320012 A-FARM GROUT PIPES				0	0	0	0	21,360	0	0	21,360

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320021	AX-FARM EXPOSE PIPE, CUT AND CAP										
320021.07	SITE IMPROVEMENTS										
320021.0702002	********** 241-AX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320021.0702102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320021.0702104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320021.0702106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320021 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320021 AX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320022	AX-FARM GROUT PIPES										
320022.07	SITE IMPROVEMENTS										
320022.0701002	********** 241-AX FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320022.0701102	GROUT PIPES IN TANK FARM- 2"- 4930', 4"- 2530', 8"- 500'	460	0 CY	0	0	0	0	0	0	0	0
320022.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	20 CY	0	0	0	0	4800	0	0	4800
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	4,800	0	0	4,800
TOTAL	COST CODE 46007 WBS 320022 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	4,800	0	0	4,800
TOTAL WBS 320022 AX-FARM GROUT PIPES				0	0	0	0	4,800	0	0	4,800

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320031	B-FARM EXPOSE PIPE, CUT AND CAP										
320031.07	SITE IMPROVEMENTS										
320031.0703002	********** 241-B FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320031.0703102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320031.0703104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320031.0703106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320031 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320031 B-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320032	B-FARM GROUT PIPES										
320032.07	SITE IMPROVEMENTS										
320032.0701002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-B FARM GROUT PIPES FROM CUT & CAP LOCATION.										
	**********										
320032.0701102	GROUT PIPES IN TANK FARM- 2"- 3960', 4"- 2560, 6"- 295'	460	0 CY	0	0	0	0	0	0	0	0
320032.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	15 CY	0	0	0	0	3600	0	0	3600
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	3,600	0	0	3,600
TOTAL	COST CODE 46007			0	0	0	0	3,600	0	0	3,600
	WBS 320032 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320032 B-FARM GROUT PIPES				0	0	0	0	3,600	0	0	3,600

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320041	BX-FARM EXPOSE PIPE, CUT AND CAP										
320041.07	SITE IMPROVEMENTS										
320041.0704002	********** 241-BX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320041.0704102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320041.0704104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320041.0704106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320041 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320041 BX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320042	BX-FARM GROUT PIPES										
320042.07	SITE IMPROVEMENTS										
320042.0701002	********** 241-BX FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320042.0701102	GROUT PIPES IN TANK FARM- 2"- 2910', 4"- 1525', 6"- 1200'	460	0 CY	0	0	0	0	0	0	0	0
320042.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	17 CY	0	0	0	0	4080	0	0	4080
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	4,080	0	0	4,080
TOTAL	COST CODE 46007 WBS 320042 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	4,080	0	0	4,080
TOTAL WBS 320042 BX-FARM GROUT PIPES				0	0	0	0	4,080	0	0	4,080

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320051	BY-FARM EXPOSE PIPE, CUT AND CAP										
320051.07	SITE IMPROVEMENTS										
320051.0705002	********** 241-BY FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320051.0705102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320051.0705104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320051.0705106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320051 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320051 BY-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320052	BY-FARM GROUT PIPES										
320052.07	SITE IMPROVEMENTS										
320052.0701002	********** 241-BY FARM GROUT PIPES FROM CUT & CAP LOCATION, **********	460	0 EA	0	0	0	0	0	0	0	0
320052.0701102	GROUT PIPES IN TANK FARM- 2"- 4190', 4"-1440', 6"- 780'	460	0 CY	0	0	0	0	0	0	0	0
320052.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	15 CY	0	0	0	0	3600	0	0	3600
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	3,600	0	0	3,600
TOTAL	COST CODE 46007 WBS 320052 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	3,600	0	0	3,600
TOTAL WBS 320052 BY-FARM GROUT PIPES				0	0	0	0	3,600	0	0	3,600

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320061	C-FARM EXPOSE PIPE, CUT AND CAP										
320061.07	SITE IMPROVEMENTS										
320061.0706002	********** 241-C FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320061.0706102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320061.0706104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320061.0706106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320061 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320061 C-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320062	C-FARM GROUT PIPES										
320062.07	SITE IMPROVEMENTS										
320062.0701002	********** 241-C FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320062.0701102	GROUT PIPES IN TANK FARM- 2"- 3160', 4"- 2400', 6"- 230', 12"- 30'	460	0 CY	0	0	0	0	0	0	0	0
320062.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	15 CY	0	0	0	0	3600	0	0	3600
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	3,600	0	0	3,600
TOTAL	COST CODE 46007 WBS 320062 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	3,600	0	0	3,600
TOTAL WBS 320062 C-FARM GROUT PIPES				0	0	0	0	3,600	0	0	3,600

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320071	S-FARM EXPOSE PIPE, CUT AND CAP										
320071.07	SITE IMPROVEMENTS										
320071.0707002	********** 241-S FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320071.0707102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320071.0707104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320071.0707106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320071 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320071 S-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320072	S-FARM GROUT PIPES										
320072.07	SITE IMPROVEMENTS										
320072.0701002	********** 241-S FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320072.0701102	GROUT PIPES IN TANK FARM- 2"- 3155', 4"- 1430', 6"- 575', 24"- 600'	460	0 CY	0	0	0	0	0	0	0	0
320072.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	65 CY	0	0	0	0	15600	0	0	15600
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	15,600	0	0	15,600
TOTAL	COST CODE 46007 WBS 320072 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	15,600	0	0	15,600
TOTAL WBS 320072 S-FARM GROUT PIPES				0	0	0	0	15,600	0	0	15,600

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320081	SX-FARM EXPOSE PIPE, CUT AND CAP										
320081.07	SITE IMPROVEMENTS										
320081.0708002	**********	460	0 EA	0	0	0	0	0	0	0	0
	241-SX FARM- EXCAVATE, CUT & CAP PIPES.										
	**********										
320081.0708102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320081.0708104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320081.0708106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	14,000	0	0	14,000
TOTAL	COST CODE 46007 WBS 320081 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	14,000	0	0	14,000
TOTAL WBS 320081 SX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	14,000	0	0	14,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320082	SX-FARM GROUT PIPES										
320082.07	SITE IMPROVEMENTS										
320082.0701002	********** 241-SX FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320082.0701102	GROUT PIPES IN TANK FARM- 2"- 2400', 4"- 100', 6"- 1460', 8"- 1250'	460	0 CY	0	0	0	0	0	0	0	0
320082.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	49 CY	0	0	0	0	11760	0	0	11760
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	11,760	0	0	11,760
TOTAL	COST CODE 46007 WBS 320082 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	11,760	0	0	11,760
TOTAL WBS 320082 SX-FARM GROUT PIPES				0	0	0	0	11,760	0	0	11,760

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320091	T-FARM EXPOSE PIPE, CUT AND CAP										
320091.07	SITE IMPROVEMENTS										
320091.0709002	********** 241-T FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320091.0709102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320091.0709104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320091.0709106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320091 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320091 T-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320092	T-FARM GROUT PIPES										
320092.07	SITE IMPROVEMENTS										
320092.0701002	********** 241-T FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320092.0701102	GROUT PIPES IN TANK FARM- 2"- 820', 4"- 2610', 6"- 380'	460	0 CY	0	0	0	0	0	0	0	0
320092.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	12 CY	0	0	0	0	2880	0	0	2880
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,880	0	0	2,880
TOTAL	COST CODE 46007 WBS 320092 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,880	0	0	2,880
TOTAL WBS 320092 T-FARM GROUT PIPES				0	0	0	0	2,880	0	0	2,880

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320101	TX-FARM EXPOSE PIPE, CUT AND CAP										
320101.07	SITE IMPROVEMENTS										
320101.070A002	********** 241-TX FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320101.070A102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	10 EA	0	0	0	0	10000	0	0	10000
320101.070A104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	10 EA	0	0	0	0	2500	0	0	2500
320101.070A106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	10 EA	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	14,000	0	0	14,000
TOTAL	COST CODE 46007 WBS 320101 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	14,000	0	0	14,000
TOTAL WBS 320101 TX-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	14,000	0	0	14,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320102	TX-FARM GROUT PIPES										
320102.07	SITE IMPROVEMENTS										
320102.0701002	********** 241-TX FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320102.0701102	GROUT PIPES IN TANK FARM- 2"- 4940', 4"- 5060', 6"- 2310'	460	0 CY	0	0	0	0	0	0	0	0
320102.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	40 CY	0	0	0	0	9600	0	0	9600
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	9,600	0	0	9,600
TOTAL	COST CODE 46007 WBS 320102 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	9,600	0	0	9,600
TOTAL WBS 320102 TX-FARM GROUT PIPES				0	0	0	0	9,600	0	0	9,600

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320111	TY-FARM EXPOSE PIPE, CUT AND CAP										
320111.07	SITE IMPROVEMENTS										
320111.070B002	********** 241-TY FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320111.070B102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	2 EA	0	0	0	0	2000	0	0	2000
320111.070B104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	2 EA	0	0	0	0	500	0	0	500
320111.070B106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	2 EA	0	0	0	0	300	0	0	300
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,800	0	0	2,800
TOTAL	COST CODE 46007 WBS 320111 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,800	0	0	2,800
TOTAL WBS 320111 TY-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	2,800	0	0	2,800

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320112	TY-FARM GROUT PIPES										
320112.07	SITE IMPROVEMENTS										
320112.0701002	********** 241-TY FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320112.0701102	GROUT PIPES IN TANK FARM- 2"- 920', 4"- 492', 6"- 1020'	460	0 CY	0	0	0	0	0	0	0	0
320112.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	11 CY	0	0	0	0	2640	0	0	2640
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,640	0	0	2,640
TOTAL	COST CODE 46007 WBS 320112 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,640	0	0	2,640
TOTAL WBS 320112 TY-FARM GROUT PIPES				0	0	0	0	2,640	0	0	2,640

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320121	U-FARM EXPOSE PIPE, CUT AND CAP										
320121.07	SITE IMPROVEMENTS										
320121.070C002	********** 241-U FARM- EXCAVATE, CUT & CAP PIPES. **********	460	0 EA	0	0	0	0	0	0	0	0
320121.070C102	EXCAVATE AND EXPOSE WATER LINE. 1 CY/LF @ 10LF= 10 CY 10 CY @ $100/CY= $1000/EA	460	5 EA	0	0	0	0	5000	0	0	5000
320121.070C104	CUT AND CAP WATERLINE 4 MH/EA= $200 MATERIAL= $50 CUT AND CAP $250/EA	460	5 EA	0	0	0	0	1250	0	0	1250
320121.070C106	BACKFILL 10CY/EA @ $15/CY ASSUME USING MATERIAL EXCAVATED	460	5 EA	0	0	0	0	750	0	0	750
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	7,000	0	0	7,000
TOTAL	COST CODE 46007 WBS 320121 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,000	0	0	7,000
TOTAL WBS 320121 U-FARM EXPOSE PIPE, CUT AND CAP				0	0	0	0	7,000	0	0	7,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320122	U-FARM GROUT PIPES										
320122.07	SITE IMPROVEMENTS										
320122.0701002	********** 241-U FARM GROUT PIPES FROM CUT & CAP LOCATION. **********	460	0 EA	0	0	0	0	0	0	0	0
320122.0701102	GROUT PIPES IN TANK FARM- 2"- 2090', 4"- 2490'	460	0 CY	0	0	0	0	0	0	0	0
320122.0701104	COST TO GROUT- MATERIAL- $120/CY LABOR- $120/CY TOTAL- $240/CY	460	10 CY	0	0	0	0	2400	0	0	2400
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	2,400	0	0	2,400
TOTAL	COST CODE 46007 WBS 320122 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	2,400	0	0	2,400
TOTAL WBS 320122 U-FARM GROUT PIPES				0	0	0	0	2,400	0	0	2,400

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX. $186,000	900	1 LS	0	0	0	0	56000	0	0	56000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	56,000	0	0	56,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	56,000	0	0	56,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	56,000	0	0	56,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				4,275	375,730	0	0	242,220	0	0	617,950

APPENDIX C

SKETCHES

RPP5002,REV.1

NORTH

AX-FARM
SEE SH3

A-FARM
SEE SH2

C-FARM
SEE SH8

CANTON AVE
BUFFALO AVE
4TH STREET LOOP
GROUT DR
4TH ST
7TH STREET
8TH STREET

241AN
241AZ
241AX
241A
241AP
241AW
241C
202A

LEGEND:

———	WATER LINE (ACTIVE)
- - - -	WATER LINE (ABANDONED)
E 574 000	LAMBERT COORDINATES (METERS)
(1964)	INSTALLATION DATE
—X—X—	EXISTING FENCE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-A & C TANK FARMS

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV NO	DESCRIPTION	APPD	DATE
1	REQUEST ADDED 4" PW LINE PER ENGINEER	PRW	5/21/08

REVISIONS

METRIC

NAME	SIGN	DATE
WH CROWLEY JR		5/14/08

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-A & C TANK FARMS

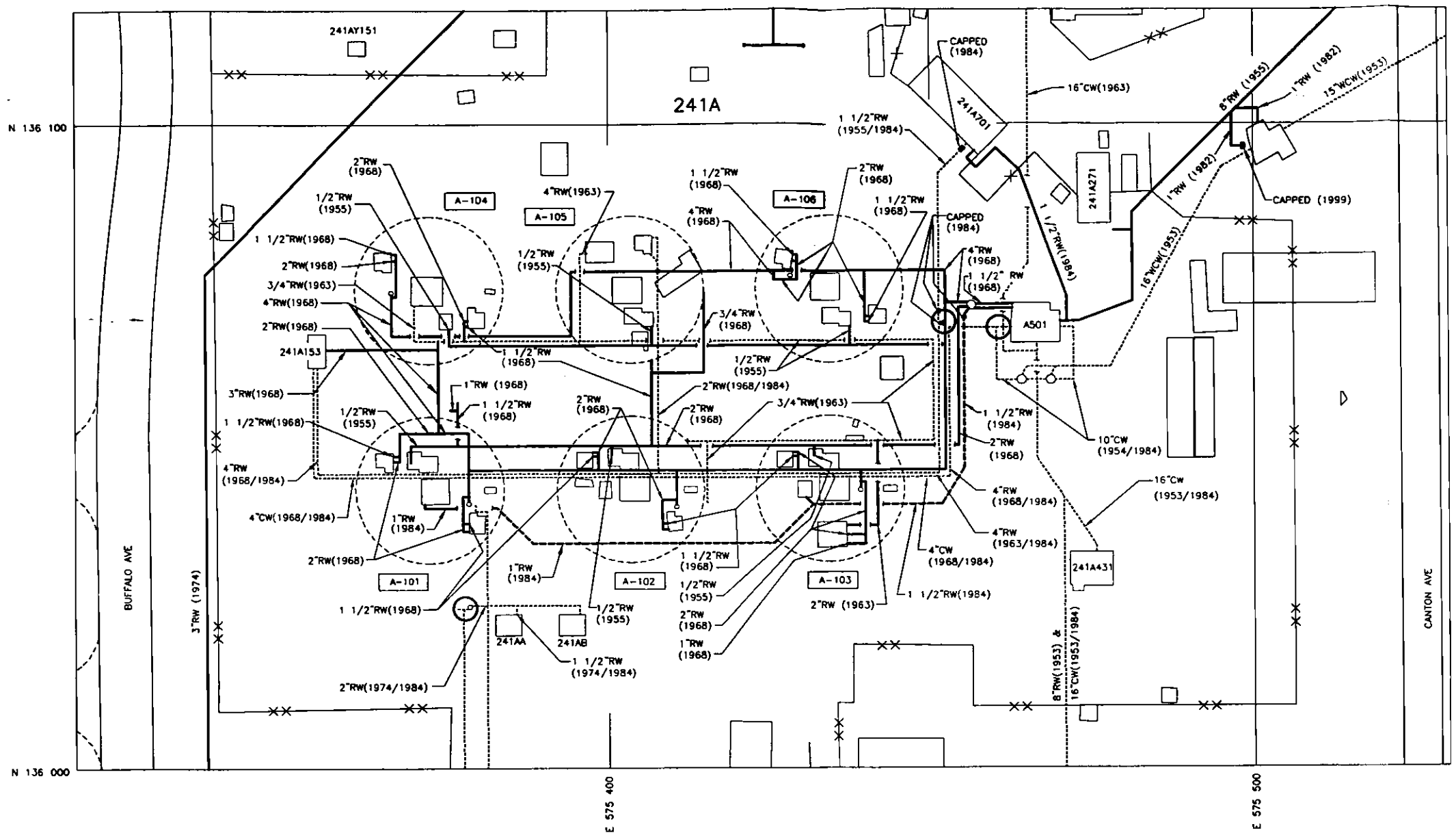
SIZE	BLDG NO	SHEET NO	DWG NO	REV
F	200E		ES-050051-C2	1

SCALE NONE | REF | SHEET 1 OF

Page I-C-01

ES-050051-C2 | REV 1 | DWG NO

NORTH



LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-# — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-A FARM

REF NUMBER	TITLE
H-14-101116, SH5	PIPING PLAN 241-AX-B TO 241-A-B
H-14-101116, SH4	PIPING PLAN 241-AX-B TO 241-A-B
H-14-101116, SH1	PIPING PLAN 241-AX-B TO 241-A-B
H-2-131003	CIVIL BLDG SITE PLAN
H-2-93616	PIPING CONTD WTR 241-A TK FARM
H-2-73749	ENGRG FL DWG 241-A & AX TK FARM
H-2-69286	CIVIL KEY PLAN 242-A BLDG & 241-A TK FARM
H-2-69240	PIPING PLAN 241-A TO 241-AX TK FARM
H-2-69188	PIPING PLAN VALVE PITS 241-A-A & B
H-2-69184	PIPING PLAN 241-A TK FARM
H-2-67565	RW LINES BACKFLOW PREVETER INSTL

REFERENCES

REF NUMBER	TITLE
H-2-66030	106-A TK ARRGT AS-BUILT
H-2-66006	104-A TK ARRGT AS-BUILT
H-2-65123	PIPING PLAN
H-2-63100	101-A TK ARRGT AS-BUILT
H-2-63099	105-A TK ARRGT AS-BUILT
H-2-62879, SH2	CIVIL PLOT PLAN & FNSH GR
H-2-62879, SH1	CIVIL PLOT PLAN & FNSH GR
H-2-61984, SH3	CIVIL PLOT PLAN 241-A TK FARM
H-2-61984, SH2	CIVIL PLOT PLAN 241-A TK FARM
H-2-61984, SH1	CIVIL PLOT PLAN 241-A TK FARM
H-2-58413	PLAN & PROFILE CW PIPING

REFERENCES

DWG NO	TITLE
H-2-57736	KEY PLAN
H-2-56780	UGND PIPING PLAN
H-2-56340	PLOT PLAN & PIPING LYT
H-2-56135	EXT OF 8" RW & 16" CW PLAN & PROFILE
H-2-56115	CONN CONB NSL COL LT PARCE FACL 241-A-B TK FARM
H-2-55901	241- GENL LAYOUT
H-2-55084	ENGRG FL DWG OUTSIDE UTIL LINES
H-2-44501, SH69	AREA MAP 200E "A" PLANT FACIL
H-2-38535	SW & RW MAP 200 EAST AREA
H-2-34505	CIVIL SITE SPLT SLUDGE WTR FACIL FOR TK 241-A-101
H-2-34501	PLAN SLUDGE WTR FACIL FOR TK 241-A-101
H-2-33981	EMER SLUICING IN TK-105-A,CON. PIPING ARRGT

DRAWING TRACEABILITY LIST

REF NUMBER — TITLE

REFERENCES

NEXT USED ON ES-050051-C2, SH1

REV NO	DESCRIPTION	DATE	DWN	CHK
1	ECN 655071 & ENGINEER INCORP CAPPED 8" RW LINE PER			

REVISIONS

METRIC

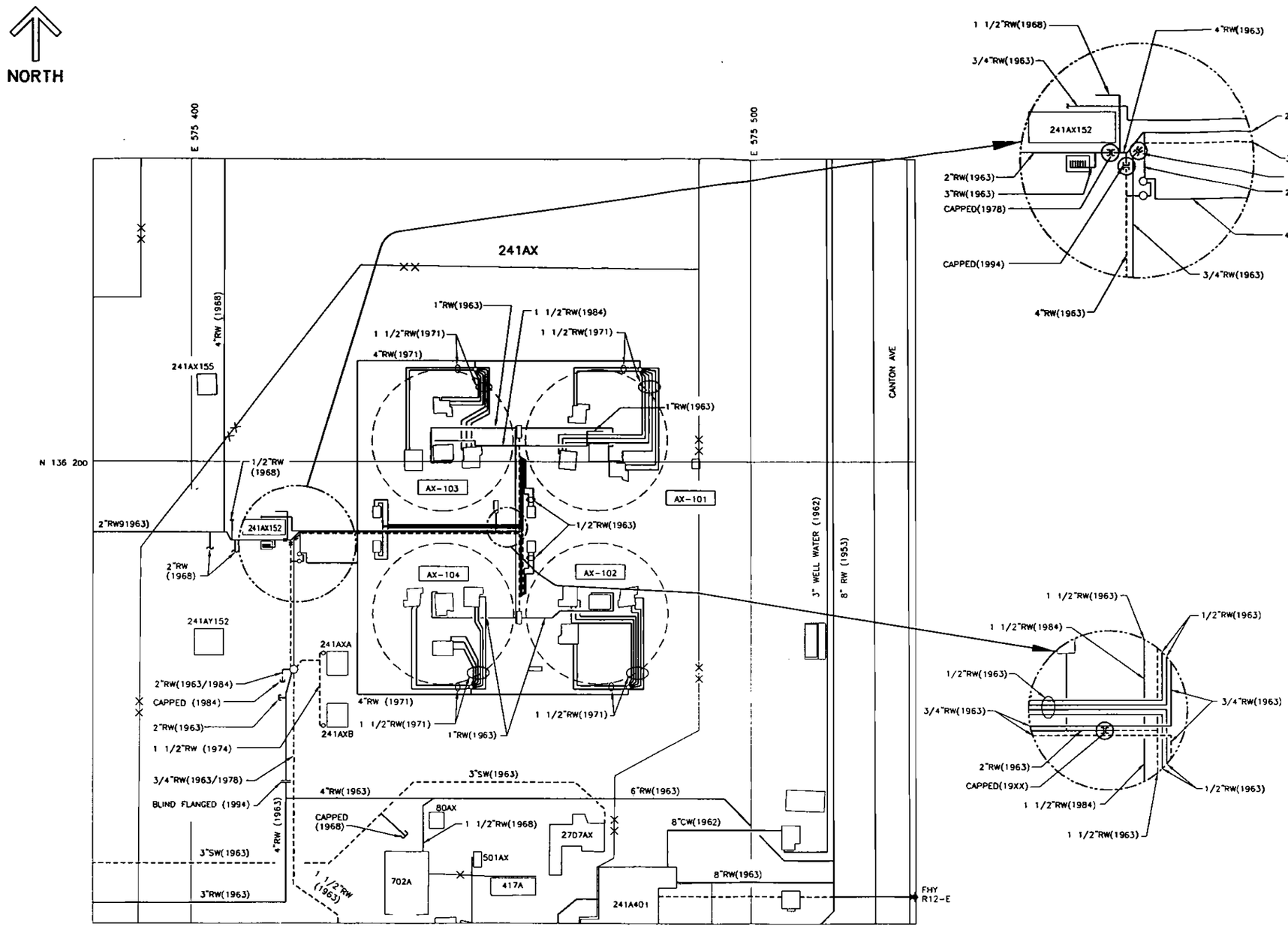
NAME — DATE
DRAWN BY WH. CROWLEY JR — 5/16/95
DESIGN ENGINEER — Date
REVIEW AUTHORITY — Date

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-A TANK FARM

SIZE F — BLDG NO 200E — DWG NO ES-050051-C2 — REV 1
SCALE 1:300 — SHEET 2 OF

ES-050051-C2 REV 1 SH 2 OF



241-AX FARM

LEGEND:

———	WATER LINE (ACTIVE)
- - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-#	TANK NUMBER
○	POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

No.	DWG #	POTENTIAL OR COMPLETED BUT NOT INCOORPORATED
4		
3		
2		
1	H-2-64414	ECN: 611176

REF NUMBER	TITLE
H-2-93617	PIPING CONTD WTR 241-AX TK FAM
H-2-73843	PIPING PLAN 241-AX TK FARM SYS 15
H-2-73842	PIPING PLAN 241-AX TK FARM SYS 15
H-2-73754	PIPING & INSTR PLANS & DET 241-AX TK FARM
H-2-73382	PIPING WASTE TK ISLN 241-AX-104
H-2-73380	PIPING WASTE TK ISLN 241-AX-103
H-2-73378	PIPING WASTE TK ISLN 241-AX-102
H-2-73376	PIPING WASTE TK ISLN 241-AX-101
H-2-70823	PIPING CONTD WTR 241-AX TK FARM
H-2-69244	PIPING PLAN VALVE PITS 241-AX- & B
H-2-69241	PIPING PLAN 241-AX TK FARM
H-2-68240	104-AX TK ARRGT AS-BUILT

REFERENCES

REF NUMBER	TITLE
H-2-68239	103-AX TK ARRGT AS-BUILT
H-2-68238	102-AX TK ARRGT AS-BUILT
H-2-68237	101-AX TK ARRGT AS-BUILT
H-2-64414	PIPING MOD 241-AX-152 DW AREA FOR 241-AY TK FARM
H-2-63843	PIPING PLAN 241-AX TK FARM TK-104
H-2-63842	PIPING PLAN 241-AX TK FARM TK-103
H-2-63841	PIPING PLAN 241-AX TK FARM TK-102
H-2-63840	PIPING PLAN 241-AX TK FARM TK-101
H-2-63836	PIPING PLOT PLAN SURROUNDING FACIL 241-AX TK FARM
H-2-57737	PLOT PLAN
H-2-57736	KEY PLAN
H-2-55894, SH2	8"RW PLAN & PF PUREX WASTE DSPL FACIL
H-2-55894, SH1	8"RW PLAN & PF PUREX WASTE DSPL FACIL
H-2-44681	241-AX-152 DW SOL PIPING & EQUIP ARRGT PLANS

REFERENCES

DRAWING TRACEABILITY LIST

DWG NO	TITLE
H-2-44676	AIR-LIFT PIPING ARRGT & CIRCULATOR DET
H-2-44675	241-AX-001-A & B PIPING ARRGT & DET
H-2-44651	PLAN & PF DW & WASTE DW PIPING TO 241-AX-151 DW SUMP
H-2-44650	PLAN & PROFILE RW & DR LINES
H-2-44646	GENL PIPING ARRGT
H-2-44629	GENL PIPING ARRGT TK FARM AREA
H-2-44620	DIR BURIED PIPING PLANT 241-AX-152 AREA
H-2-44619	DIR BURIED PIPING PLANT 103 & 104 AX
H-2-44618	DIR BURIED PIPING PLANT 101 & 102 AX
H-2-44552	PLOT PLAN FNSHD GR & FACIL
H-2-44501, SH69	AREA MAP 200E "A" PLANT FACIL
H-2-36535, SH10	SW & RW MAP 200E AREA
H-2-4548	PLOT PLAN & DET EXCP WITH DW-AX NOT SCHEMATICS

REFERENCES

NEXT USED ON ES-050051-C2, SH1

REV	DATE	DESCRIPTION	ENGR	CHECKED
1		REVISED PER ENGR COMMENTS	PRW 9/00	

REVISIONS

METRIC

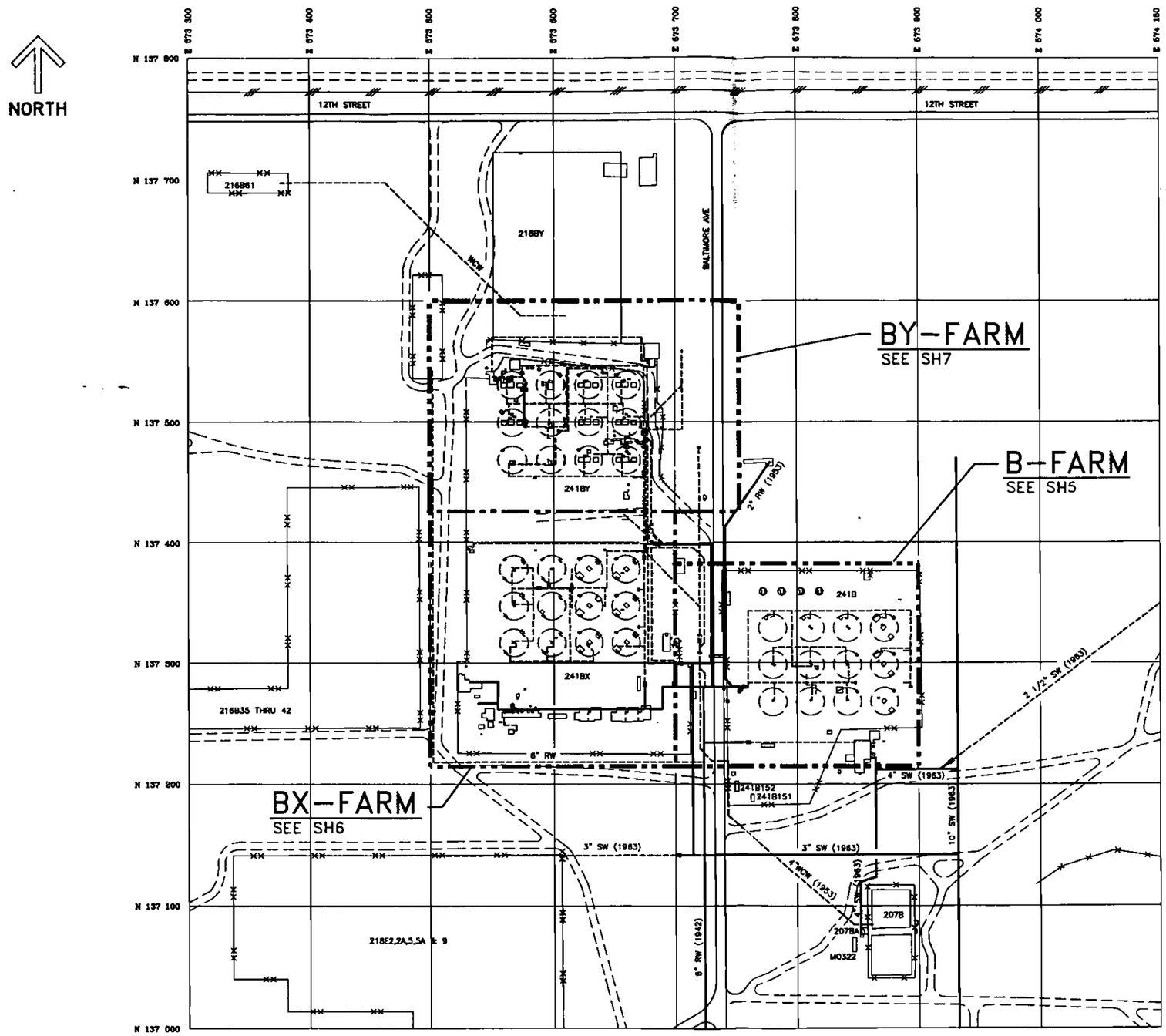
NAME	DATE
WH CROWLEY JR	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-AX TANK FARM

SIZE	CODE IDENT NO	DWG NO	REV
F	20DE	ES-050051-C2	1

SCALE 1:300 SHEET 3 OF



LEGEND:

———	WATER LINE (ACTIVE)
- - - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-#	TANK NUMBER

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-B TANK FARMS

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV NO	REVISION DESCRIPTION	REV BY	DATE
1	REVISE PER ENGR COMMENTS	PAL	5/8/1

REVISIONS

METRIC

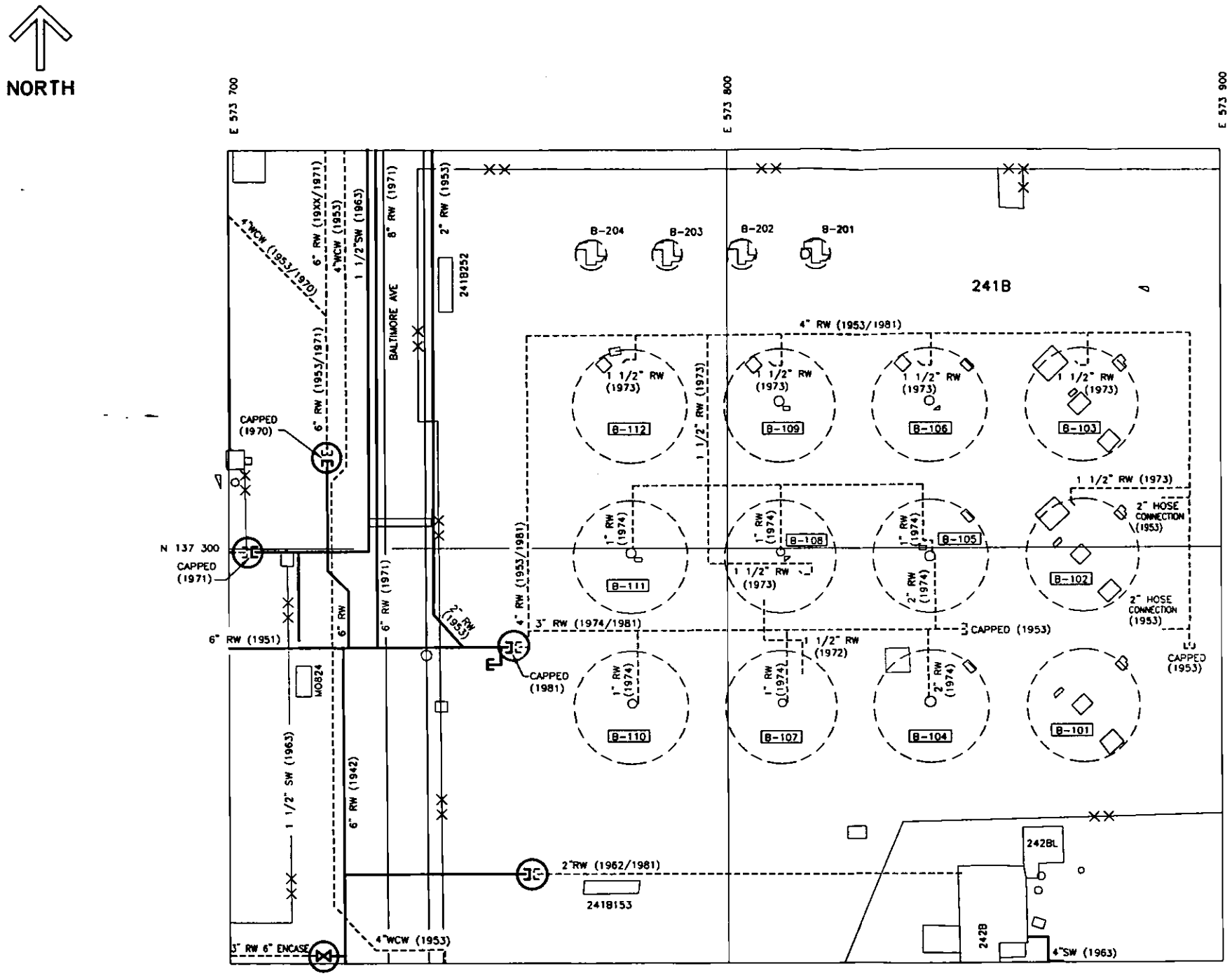
NAME	
WH CROWLEY JR	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-B TANK FARMS

SIZE	SLDR NO	DWG NO	REV
F	200E	ES-050051-C2	0

SCALE NONE



241-B TANK FARM

LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-# — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

REF NUMBER	TITLE
H-2-73288	PIPING WASTE TK ISLN 241-B-112
H-2-73287	PIPING WASTE TK ISLN 241-B-111
H-2-73286	PIPING WASTE TK ISLN 241-B-109
H-2-73285	PIPING WASTE TK ISLN 241-B-108
H-2-73284	PIPING WASTE TK ISLN 241-B-106

REFERENCES

REF NUMBER	TITLE
H-2-73283	PIPING WASTE TK ISLN 241-B-105
H-2-73282	PIPING WASTE TK ISLN 241-B-104
H-2-73281	PIPING WASTE TK ISLN 241-B-103
H-2-73280	PIPING WASTE TK ISLN 241-B-102
H-2-73279	PIPING WASTE TK ISLN 241-B-110
H-2-73278	PIPING WASTE TK ISLN 241-B-107
H-2-73277	PIPING WASTE TK ISLN 241-B-101 DET
H-2-73276	PIPING WASTE TK ISLN 241-B-101
H-2-73273	PIPING WASTE TK ISLN 241-B & BX FARM PLAN PLAN

REFERENCES

REF NUMBER	TITLE
H-2-70891	PIPING & INSTM PLAN 241-B TK FARM
H-2-70890	PIPING & INSTM PLAN 241-B TK FARM
H-2-70881	ENGRG FL DIA SALT WELL SYS
H-2-70824	PIPING CONTROLLED WRR 241-B TK FARM
H-2-44501-140	AREA MAP 200 EAST "B" PLANT FACIL
H-2-44501-139	AREA MAP 200 EAST "B" PLANT FACIL
H-2-44501-129	AREA MAP 200 EAST "B" PLANT FACIL
H-2-44500	PLANT FACILITIES KEY PLAN AREA MAP 200 EAST "B"

REFERENCES

DWG NO	TITLE
H-2-42463	PIPING ARRGT OUTSIDE UTIL LINES SH4
H-2-42462	PIPING ARRGT OUTSIDE UTIL LINES SH3
H-2-41975	PIPING ARRGT OUTSIDE UTIL LINES SH1
H-2-36535	SAN & RW MAP 200 EAST AREA
H-2-36473	SALT WELL PLOT PLAN & DET
H-2-36335	PIPING PLANS TK 241-B-101, 109 & 112
H-2-36334	PIPING PLANS TK 241-B-102, 103 & 106
H-2-36332	PIPING PLOT PLAN 241-B TK FARM
H-2-2021	EVAPORATION 200 EAST PLOT PLAN OUTSIDE LINES FIRST CYCLE

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
NEXT USED ON ES-050051-C2, SH4	

REFERENCES

REV NO	DESCRIPTION	DATE	CHKD	APPD
1	REVISE PER ENGR COMMENTS	PR 1/06/01		

REVISIONS

METRIC

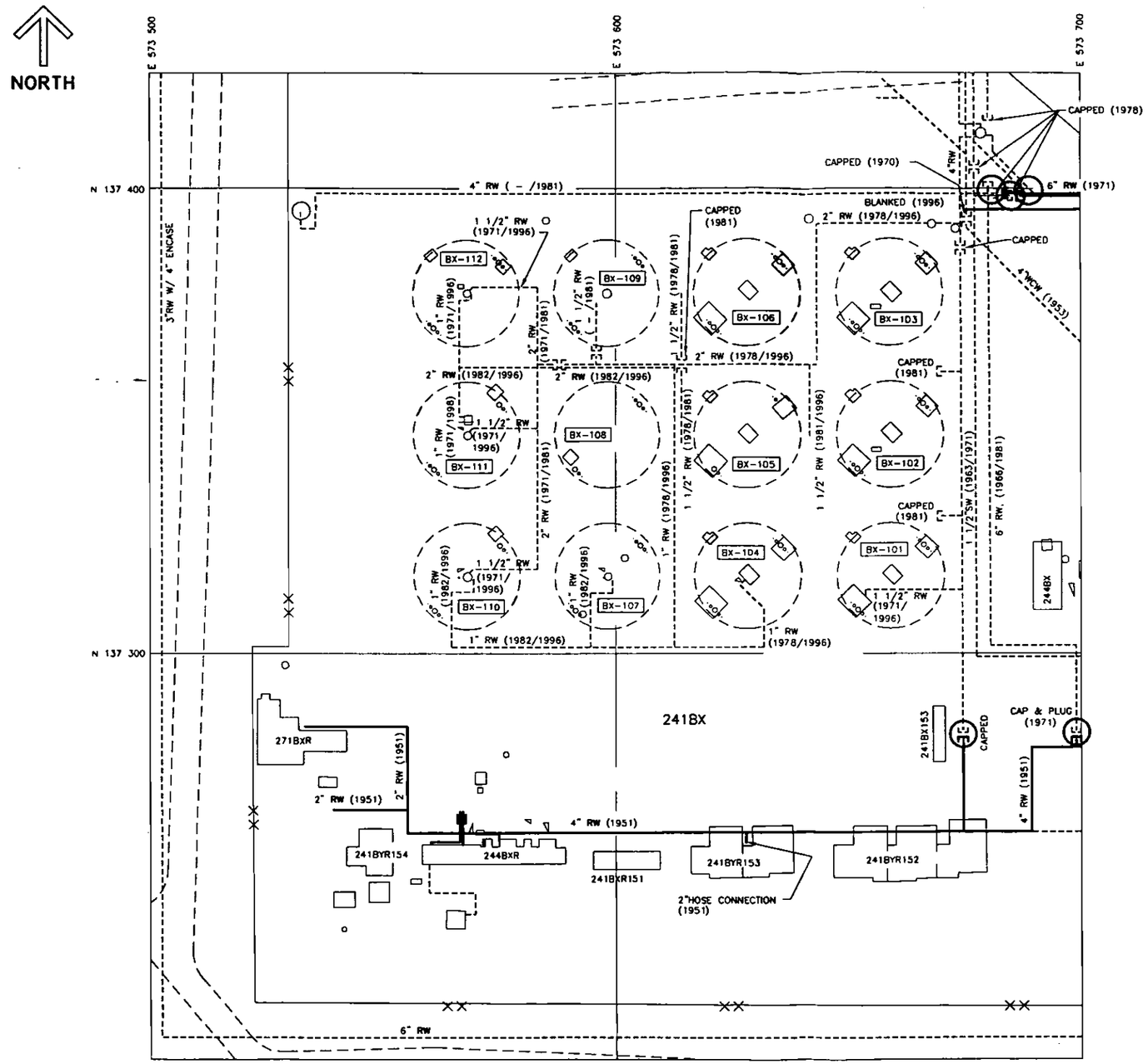
NAME	DATE
WH CROWLEY JR	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-B TANK FARM

SIZE F | CODE IDENT NO 200E | DWG NO ES-050051-C2 | REV 1

SCALE 1:400 | SHEET 5 OF



241-BX TANK FARM

LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-# — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

REF NUMBER	TITLE
H-14-100860	CIVIL TK FARM COMPOSITE
H-2-73862	PIPING PLAN W/SPRT & AHR DET & SECT
H-2-73320	PIPING WASTE TK ISLN 241-BX-112
H-2-73319	PIPING WASTE TK ISLN 241-BX-109
H-2-73318	PIPING WASTE TK ISLN 241-BX-107
H-2-73317	PIPING WASTE TK ISLN 241-BX-106
H-2-73315	PIPING WASTE TK ISLN 241-BX-104
H-2-73314	PIPING WASTE TK ISLN 241-BX-103

REFERENCES

REF NUMBER	TITLE
H-2-73313	PIPING WASTE TK ISLN 241-BX-111
H-2-73312	PIPING WASTE TK ISLN 241-BX-110
H-2-73273	PIPING WASTE TK ISLN 241-B & BX FARM PLOT PLAN
H-2-70889	PIPING & INSTM PLAN 241-BX TK FARM
H-2-70888-1 & 2	PIPING & INSTM PLAN 241-BX TK FARM
H-2-70881	ENGRG FL DIA SALT WELL SYS
H-2-70826	PIPING CONTROLLED WRK 241-BX TK FARM
H-2-62402	CIVIL PLOT PLAN WASTE SOLIDIFICATION
H-2-44501	AREA MAP 200 EAST "B" PLANT FACIL

REFERENCES

DWG NO	TITLE
H-2-42463	PIPING ARRGT OUTSIDE UTIL LINES SH4
H-2-42462	PIPING ARRGT OUTSIDE UTIL LINES SH3
H-2-41975	PIPING ARRGT OUTSIDE UTIL LINES SH1
H-2-36535	SAN & RW MAP 200 EAST AREA
H-2-36333	PIPING PLOT PLAN 241-BX TK FARM
H-2-35956	MECHL PLOT PLAN 241-BX TK FARM PIPING REDESIGN
H-2-35940	PIPING PLOT PLAN & DWG INDEX
H-2-610	GENERAL LAYOUT 241-BX

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
NEXT USED ON ES-050051-C2, SH4	

REFERENCES

REV NO	REVISION	DATE	DWN	CHKD
1	REVISE PER ENGR COMMENTS	PAL 3/6/9		

REVISIONS

METRIC

NAME	SIGNATURE	DATE
WH CROWLEY JR		5/14/9

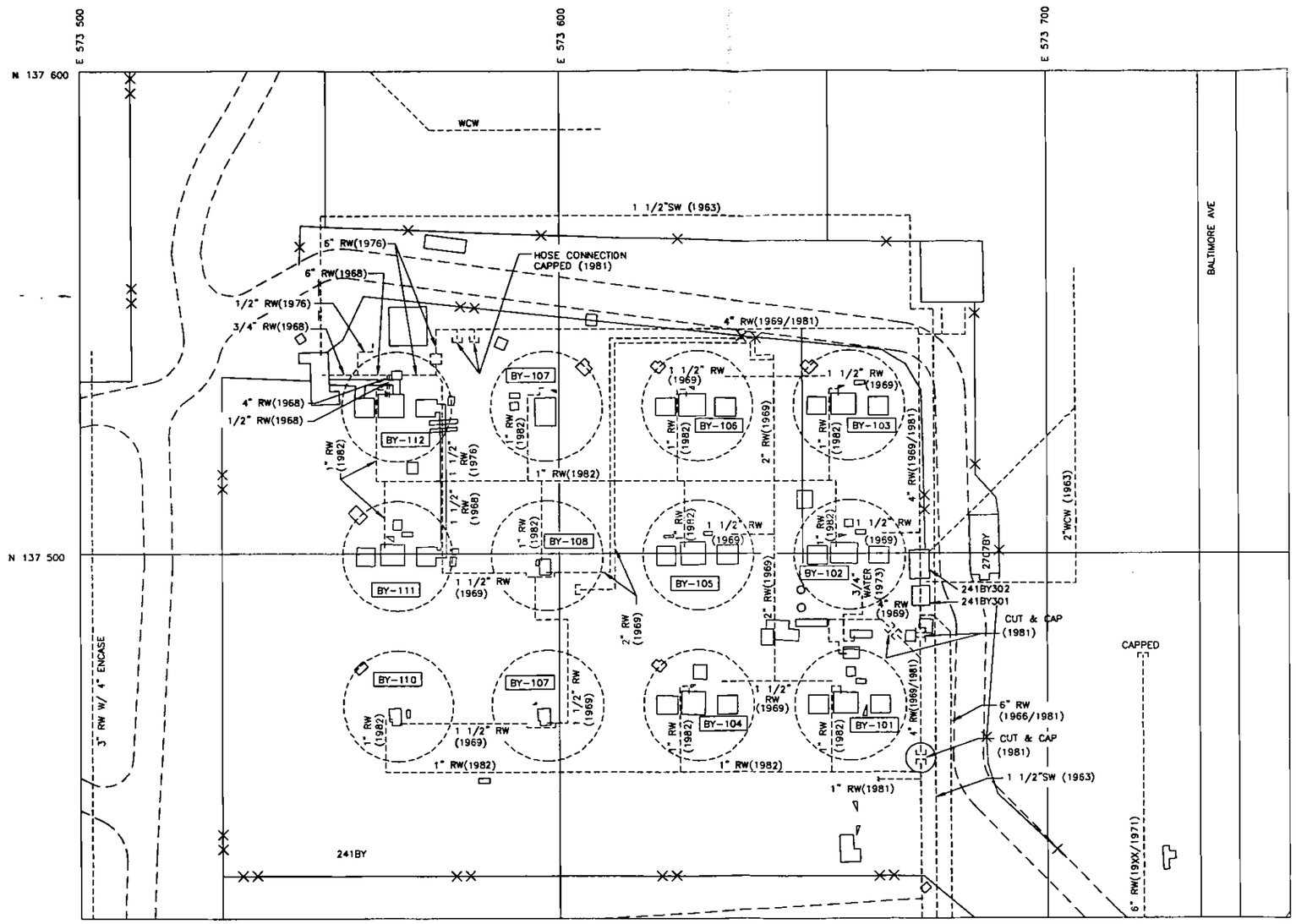
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-BX TANK FARM

SIZE	BLDG NO	DWG NO	REV
F	200E	ES-050051-C2	1

SCALE 1:400 SHEET 6 OF

NORTH



LEGEND:

————	WATER LINE (ACTIVE)
- - - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-#	TANK NUMBER
○	POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-BY TANK FARM

REF NUMBER	TITLE
H-2-73256	PIPING WASTE TK ISLN 241-BY-112
H-2-73255	PIPING WASTE TK ISLN 241-BY-111
H-2-73254	PIPING WASTE TK ISLN 241-BY-110
H-2-73253	PIPING WASTE TK ISLN 241-BY-109
H-2-73252	PIPING WASTE TK ISLN 241-BY-104
H-2-73251	PIPING WASTE TK ISLN 241-BY-101
H-2-73250	PIPING WASTE TK ISLN 241-BY-108
H-2-73249	PIPING WASTE TK ISLN 241-BY-107
H-2-73248	PIPING WASTE TK ISLN 241-BY-106

REFERENCES

REF NUMBER	TITLE
H-2-73247	PIPING WASTE TK ISLN 241-BY-105
H-2-73246	PIPING WASTE TK ISLN 241-BY-103
H-2-73244	PIPING WASTE TK ISLN 241-BY-102
H-2-70887	PIPING & INSTM PLAN 241-BY TK FARM
H-2-70886	PIPING & INSTM PLAN 241-BY TK FARM
H-2-70881	ENGRG FL DIA SALT WELL SYS
H-2-70828	PIPING CONTROLLED WTR 241-BY TK FARM
H-2-62451	LTS,U1 PIPING, DWG & DIES GRID PLAN TK 241-BY-101 & 102
H-2-62401	LTS,U2 CIVIL PLOT PLAN & KEY MAP WASTE SUBSURFACE
H-2-44501-151	AREA MAP 200 EAST "B" PLANT FACIL
H-2-44501-140	AREA MAP 200 EAST "B" PLANT FACIL
H-2-42463	PIPING ARRGT OUTSIDE UTIL LINES SH4
H-2-42462	PIPING ARRGT OUTSIDE UTIL LINES SH3
H-2-41975	PIPING ARRGT OUTSIDE UTIL LINES SH1

REFERENCES

REF NUMBER	TITLE
H-2-37112	112-BY TK ARRGT "AS-BUILT"
H-2-37111	111-BY TK ARRGT "AS-BUILT"
H-2-37110	110-BY TK ARRGT "AS-BUILT"
H-2-37109	109-BY TK ARRGT "AS-BUILT"
H-2-37108	108-BY TK ARRGT "AS-BUILT"
H-2-37107	107-BY TK ARRGT "AS-BUILT"
H-2-37106	106-BY TK ARRGT "AS-BUILT"
H-2-37105	105-BY TK ARRGT "AS-BUILT"
H-2-37104	104-BY TK ARRGT "AS-BUILT"
H-2-37103	103-BY TK ARRGT "AS-BUILT"
H-2-37102	102-BY TK ARRGT "AS-BUILT"
H-2-37101	101-BY TK ARRGT "AS-BUILT"
H-2-36535	SAN & RW MAP 200 EAST AREA
H-2-36490	TK 241-BY-108 ISOLATION

REFERENCES

DWG NO	TITLE

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-36090-2	BOT CLR PROTOTYPE SECT VIEWS & DET
H-2-36090-1	BOT CLR PROTOTYPE PLAN PLAN ENGR FL DIA 7 PRCS FL DIA
H-2-35938	ENGRG FL DIA TK BY-101 & 105
H-2-35235	LTS,U2 PIPING PLOT PLAN 241-BY TK FARM
H-2-34800	TKS 107 & 110 BY ADD TO LTS,32
H-2-34302	TKS 108 & 109 BY ADD TO LTS,32
H-2-33479	LTS,31 CIRCULATING SCRUBBING SYS PROTOTYPE
H-2-33477	ENGRG FL DIA & DWG INDEX
H-2-33057	PLAN & PROFILE SAN WTR TO 241-BY-302
H-2-32841	241-BY-TK-102 PLOT PLAN & GEOL ARRGT LTS,31
H-2-32283	ABOVE GND WTR & DRAIN PIPING PLAN & EL
H-2-32266	TO 207-B PLAN & PROFILE 241-BY FARM LTS,U1 RW SUPPLY & WASTE COOLING H2O
H-2-32262	LTS,U1 241B, BX & BY FARM GEOL AREA PLAN IN TK
H-2-1305	PLOT PLAN ADDL WASTE STOR FACIL 200 EAST AREA

REFERENCES

NEXT USED ON ES-050051-C2, SH4

REV NO	DESCRIPTION	REV DATE	ENGR	COMPANY
1	REVISE PER ENGR COMMENTS	PAL 3/6/1		

REVISIONS

METRIC

NAME	DATE
WH CROWLEY JR	5/1/95

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-BY TANK FARM

SIZE F | SCALE NO 200E | DRAWING NO ES-050051-C2 | REV 1

SCALE 1:400 | SHEET 7 OF

RPP-5002,REV.1

NORTH

E 575 100 | E 575 200 | E 575 300

N 136 600 | N 136 500

241C

C-301 | C-201 | C-202 | C-203 | C-204 | C-112 | C-111 | C-109 | C-110 | C-108 | C-107 | C-106 | C-105 | C-104 | C-103 | C-102 | C-101

241C252 | RAD TRLR | 241CR153 | 241CR152 | 241CR151 | 244CR | 271CR

6" PW (2000)
12"RW(1997)
6"RW(1953/1984)
4" RW (1953/1984)
1"RW(1979/1986)
1"RW(1979/1986)
4"RW(1953)
CAPPED (1984)
CAPPED(1986)
1"RW(1979/1986)
2"RW (1977)
2"HOSE CONNECTION
4"RW(1953)
4"RW(1953)
2"RW(1967)
1 1/2"RW(1953)
2"HOSE CONNECTION
1"RW(1953)
4"RW (1953)
4"RW(1963)
12"SW(1997)
12"RW(1997)

LEFT TO RIGHT:
1"RW(1995)
4"CHILLED WATER SUPPLY (1995)
4"CHILLED WATER RETURN (1995)

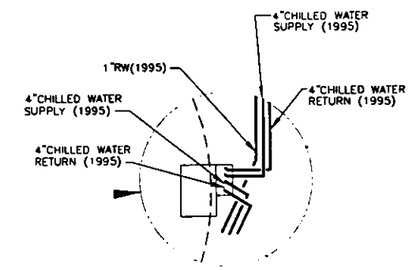
CAPPED (1953)
4"RW (1953/1988)
3"RW (1963/1998)
CAPPED (1984)
CAPPED (1998)
1 1/4"RW(1986/1998)
CAPPED (1998)
3"RW(1963)
1 1/2"RW(1963)
3/8"RW (1963/1998)
CAPPED (1998)
3"RW(1963)
2"RW (1963/1998)
CAPPED (1984)
3"SW(1963)

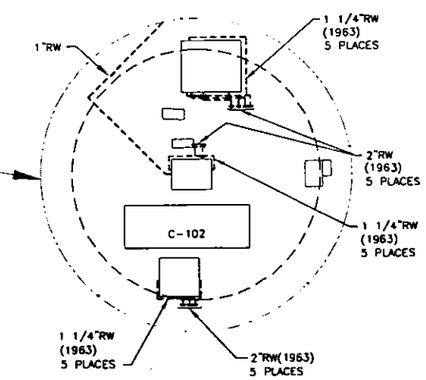
LEGEND:

———	WATER LINE (ACTIVE)
- - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-1	TANK NUMBER
○	POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.





REF NUMBER	TITLE
H-2-824323	CIVIL SITE PLAN
H-2-823453	CIVIL SITE PLAN
H-2-818531	PIPING AIR & WTR SVCE BLDG PLAN & SECT
H-2-818521	PIPING TK 241-C-106
H-2-818520	PIPING 241-C TK FARM
H-2-818518, SH2	PIPING SVCE PIPING SECT & DET
H-2-818518, SH1	PIPING SVCE PIPING PLAN & DET
H-2-818482	PIPING PRCS BLDG DRAIN & SPLY PLAN
H-2-818470	HVAC TK C-106 VENTILATION PLAN
H-2-818469	HVAC OVERALL E-FARM SHE PLAN TK C-106
H-2-818431	CIVIL 241-C TK FARM SITE PLAN

REFERENCES

REF NUMBER	TITLE
H-2-818430	CIVIL 241-C-106 RW SYS PLAN & PF
H-2-818427	CIVIL 241-C-106 WTR SYS PLAN & PF
H-2-818424	CIVIL PROJECT SITE PLAN
H-2-93620	PIPING CONTD WTR 241-C TK FARM
H-2-88728	CIVIL PLAN/PF & DET 12" FIRE WTR
H-2-88727	CIVIL PLAN/PF & DET 12" FIRE WTR
H-2-85884, SH 2	PIPING 241-C-106 CHILLER INSTL
H-2-73973	PIPING & INSTM PLAN 241-C TK FARM
H-2-73970	ENGRG FL DIAG SALT WELL SYS
H-2-73968	ENGRG FL DIAG 241-C TK FARM
H-2-73878	PIPING PLAN 241-C TK FARM

REFERENCES

REF NUMBER	TITLE
H-2-73347	PIPING WASTE TK ISLN TK 241-C-107
H-2-73346	PIPING WASTE TK ISLN TK 241-C-106
H-2-73345	PIPING WASTE TK ISLN TK 241-C-105
H-2-73344	PIPING WASTE TK ISLN TK 241-C-104
H-2-73343	PIPING WASTE TK ISLN TK 241-C-103
H-2-73342	PIPING WASTE TK ISLN TK 241-C-102
H-2-73338	PIPING WASTE TK ISLN C-TK FARM PLOT PLAN
H-2-61962	PLOT PLAN 241-C TK FARM
H-2-58609	OIL PLAN & PF UG(INILL 241-UG-101 TO 241-C-151)
H-2-44501, SH2	AREA MAP 200E "A" PLANT FCIL
H-2-44501, SH1	AREA MAP 200E "A" PLANT FCIL

REFERENCES

241-C TANK FARM

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-41424	PIPING ARRGT OF OUTSIDE UTIL LINES SH1
H-2-36669	CIVIL FIRE PROTECTION LINE PLAN & PF DWG INDEX
H-2-3653	SW & RW MAP 200E AREA
H-2-33087	[241-CR-151 TO 102-C], 102A, 103 [241-1-152 TO 101-C] LINE167 [241-CR-152 TO 102-C], 104-3, 104-4
H-2-32371	FIRE PLAN TANK AR DIE PIPE, 241-101 TO 241-C-151
H-2-4574	PRCS & SVCE PIPING TK RD LONGHUT SIA
H-2-4566	WTR & DRAIN LINES PLAN & PROFILES
H-2-4565	PLOT PLAN ROAD DWG SCHED
H-2-2921	OUTSIDE PIPING TOP IN FARM SCHM ARRGT

REFERENCES

NEXT USED ON ES-050051-C2, SH1

REV	DESCRIPTION	DATE	APPD
1	REQUEST INCORP 6" PW LINE PER ENGINEER	PRW 1/21/98	

REVISIONS

METRIC

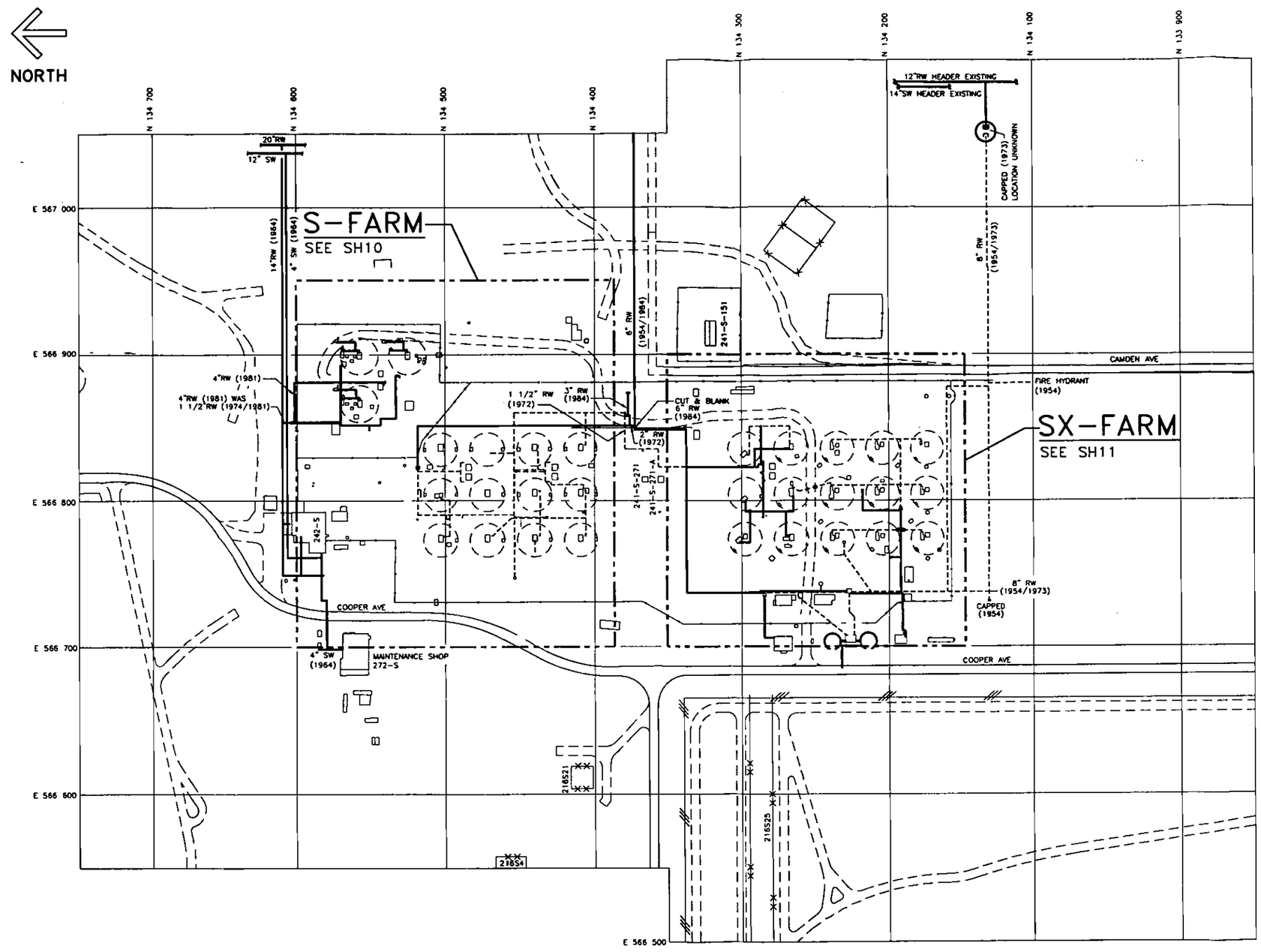
NAME	DATE
WH CROWLEY JR	1/21/98

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-C TANK FARM

SIZE F | SCALE 200E | ES-050051-C2 | REV 1
SCALE 1:400 | SHEET 8 OF

ES-050051-C2



LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-# — TANK NUMBER
- POTHOLE

241-S TANK FARMS

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
NEXT USED ON	REFERENCES

REV NO	DESCRIPTION	REV DATE	CHKD	DATE
1	REVISE PER ENGR COMMENTS	PAL 3/6/1		

REVISIONS

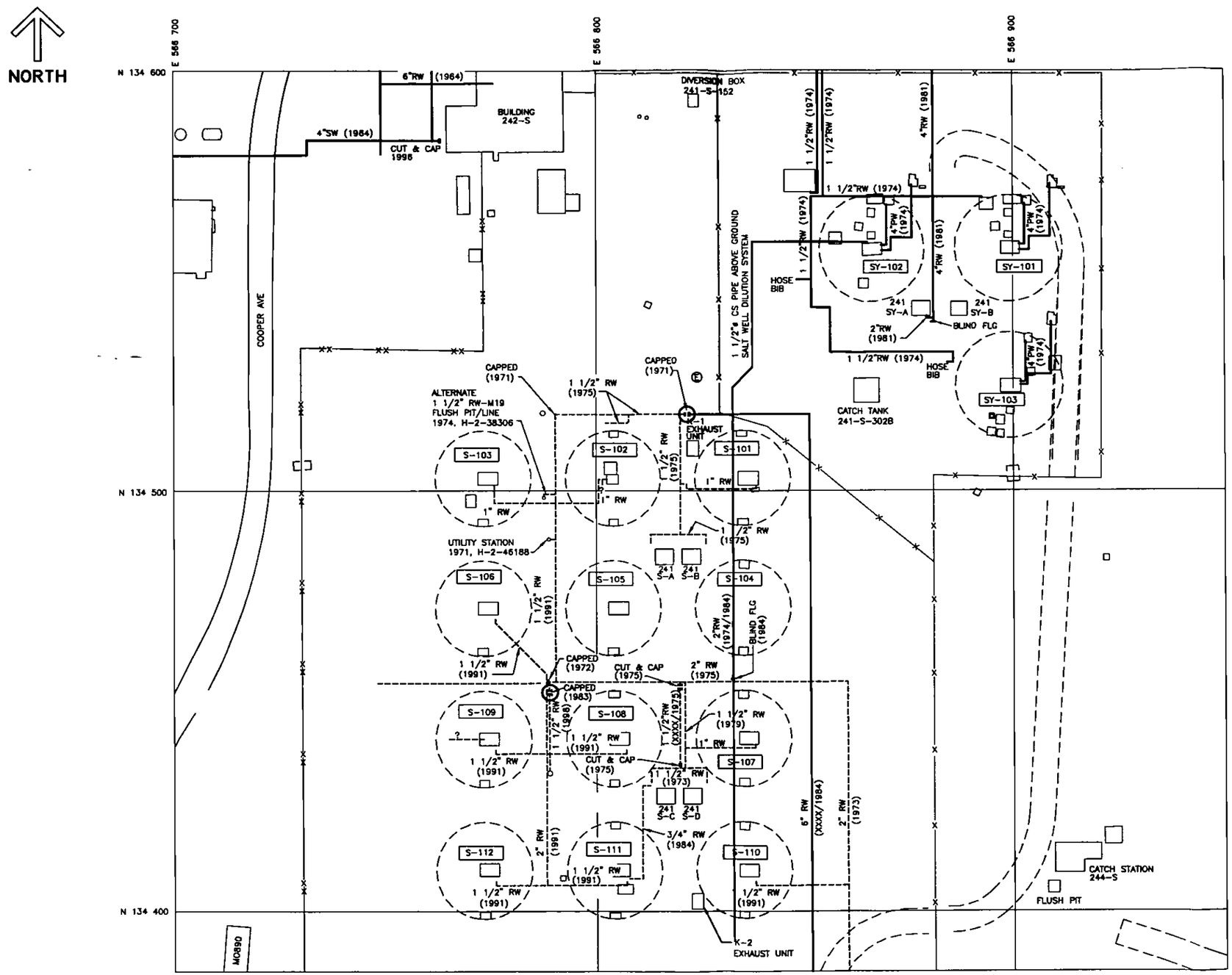
METRIC

NAME	SIGN	DATE
DRAWN BY WH CROWLEY JR		

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-S TANK FARM

SIZE F | SCALE 200W | DWG NO ES-050051-C2 | REV 1
SCALE NONE | SHEET 9 OF



LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-/ — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-S TANK FARMS

REF NUMBER	TITLE
H-2-97703	200W AREA WTR & STM MAP SOUTH SECT
H-2-63619	PIPING CONTROLLED WTR 241-SX TK FARM
H-2-63623	PIPING CONTROLLED WTR MISC DET
H-2-63618	PIPING CONTROLLED WTR 241-S TK FARM
H-2-69611	241-S TK FARM RW & INSTR AIR PIPING PLAN
H-2-73690	PIPING PLAN & SECTIONS SPRT & ANR
H-2-73705	PIPING INSTR PLAN & DET 241-S TK FARM
H-2-71052	PIPING PLANS & SECTION
H-2-70835	PIPING RW & SERVICE PIT MODIFICATION
H-2-69744	RW MOD IN 241-S TK FARM
H-2-69600	NEW 2" RW SERVICE TO 241-S-D FLUSH PIT
H-2-46288	CIVIL 4"SW & 14"RW PLAN, PROFILES & DET

REFERENCES

REF NUMBER	TITLE
H-2-46192	PIPING PLAN SECT 241-S TK FARM TO 241-SX TK FARM
H-2-46191	WIDE PIT PIPING PLAN 241-S TK FARM WIDE PIT 241-S-C & D
H-2-46190	WIDE PIT PIPING PLAN 241-S TK FARM WIDE PIT 241-S-A & B
H-2-46189	PIPING PLAN - TANKS 107 THRU 112
H-2-46188	PIPING PLAN - TANKS 101 THRU 106
H-2-46172	VENTILATION DUCTWORK PLAN & DETS
H-2-46611-46	AREA MAP 200W "S" PLANT FACILITIES
H-2-46611-38	AREA MAP 200W "S" PLANT FACILITIES
H-2-38579	241-S-B WELL & SL FLUSH TO 241-S-D & PIPING BS VIS B MAP
H-2-38306	PIPING PLAN & SECT 241-S TK FARM ALTN'S
H-2-37903	PIPING PLAN TANK 103
H-2-37902	PIPING PLAN TANK 102
H-2-37901	PIPING PLAN TANK 101

REFERENCES

DWG NO	TITLE

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-37778-3	PIPING PLAN 241-ST TANK FARM
H-2-37778-1/2	PIPING PLAN TANKS 101, 102 & 103
H-2-37777-1/2	PIPING PLAN 241-SY TK FARM 242-S BLDG AREA
H-2-37701	CIVIL PLOT PLAN 241-ST TANK FARM
H-2-37531	108-S TK ARRGT "AS-BUILT"
H-2-37530	107-S TK ARRGT "AS-BUILT"
H-2-37527	104-S TK ARRGT "AS-BUILT"
H-2-37525	102-S TK ARRGT "AS-BUILT"
H-2-37524	101-S TK ARRGT "AS-BUILT"
H-2-34904	TK-104-S SALT WELL SYS & TK-107-S PUMPOUT
H-2-1774	GENERAL LAYOUT 241-S

REFERENCES

NEXT USED ON ES-050051-C2, SH9

REV NO	DESCRIPTION	BY	CHKD	APPD	DATE
1	REVISE PER ENGR COMMENTS	PAL			5/8/1

REVISIONS

METRIC

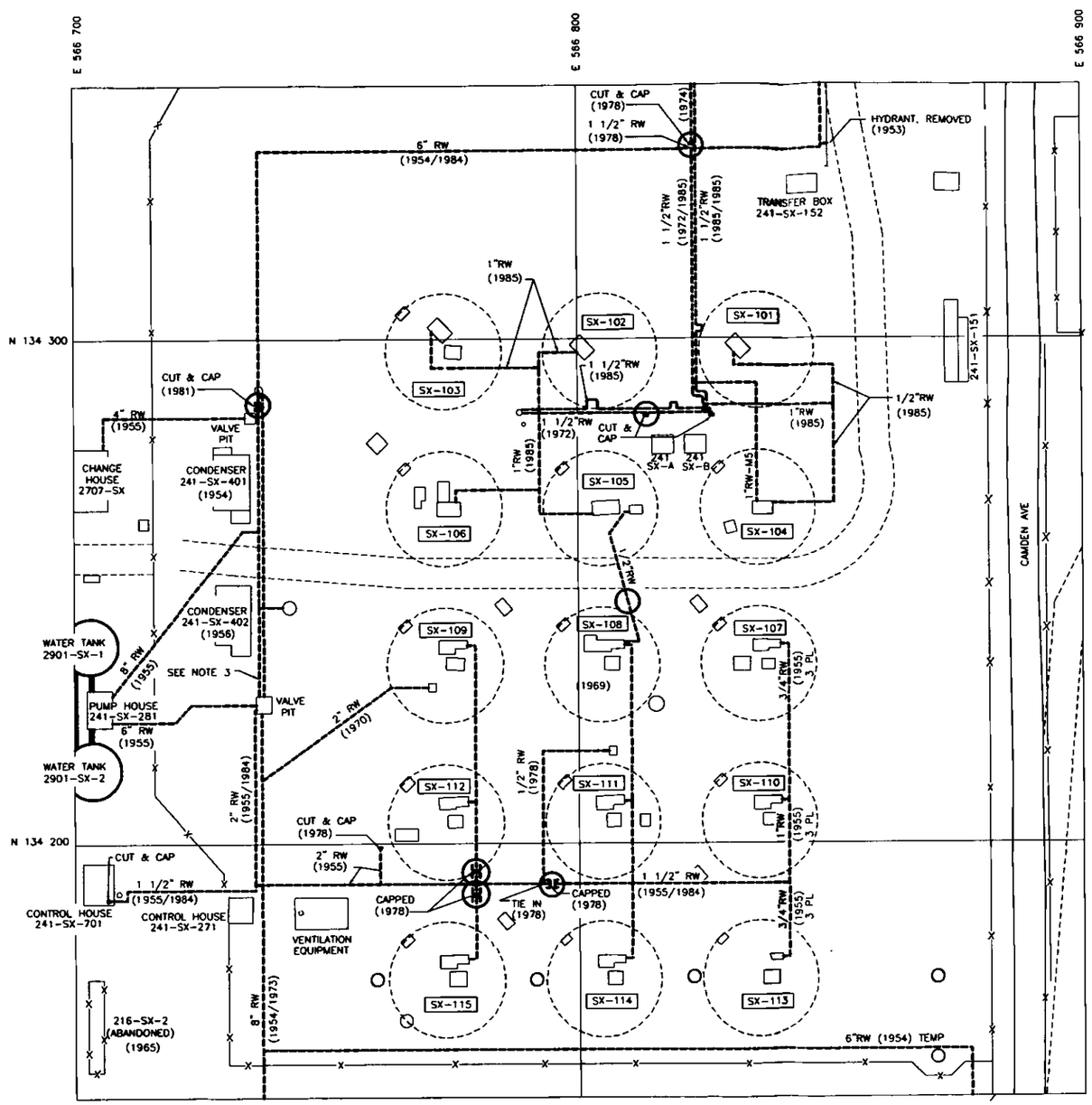
NAME	SIGN	DATE
WH CROWLEY JR		

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WATER LINES
241-S TANK FARM

SIZE F | SUB NO 200W | DWG NO ES-050051-C2 | REV 1

SCALE 1:400 | SHEET 10 OF



241-SX TANK FARM

LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-1 — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM
2. SX FARM WAS CONSTRUCTED IN PHASES. TANKS 101 THRU 106 AND TRANSFER PIPING FROM SX-151 WERE BUILT IN 1953-54. TANKS 107 THRU 115 WERE BUILT IN 1955-56.
3. THIS 8" RAW WATER LINE WAS CUT & CAPPED NEAR THE 20' MAIN AND AT UNKNOWN LOCATION SOUTH OF BLDG. 241-SX-402. LINE IS ABANDONED. (1973)

REF NUMBER	TITLE
H-2-93645	PIPING PLAN 241-SX TK FARM, TK 104-106
H-2-93644	PIPING PLAN 241-SX TK FARM, TK 101-103
H-2-93642	ENERG FLOW DIAGRAM 241-SX TK FARM
H-2-93619	PIPING CONTROLLED WTR 241-SX TK FARM
H-2-73208	PIPING WASE IN VLVE 241-SX RAW PUMP PLAN & DIV BOX PLANS
H-2-70634	CONTROLLED WTR 241-SX TK FARM
H-2-46241	VALVE PIT PIPING PLAN 241-SX IN RAW VALVE PITS 241-SX-A & B
H-2-46240	PIPING PLAN 241-SX TK FARM TO TKS 101 THRU 106
H-2-46192	PIPING PLAN SECT 241-S TK FARM TO 241-SX TK FARM
H-2-44511-38	AREA MAP 200 WEST "S" PLANT FACIL
H-2-44511-30	AREA MAP 200 WEST "S" PLANT FACIL
H-2-39952	AIR LIFT CIRCULATORS PLOT PLAN & OUTSIDE LINES
H-2-39930	EMER WTR PMP HSE & CHANGE HOUSE

REFERENCES

DWG NO	TITLE

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-39904	241-SX-402 COND, 8"RW PLAN & PROFILE
N-2-39901	TKS 107-115 MANIFOLD FACIL
H-2-39579	8" PRESSURIZED COOLING WTR TO SUMP 241-SX-401 COND, 8"RW, & COND TO 216-SX-2A
H-2-39574	WTR COOLED COND ARRG'T
H-2-39501	GENL LYT WASTE DSPL FACIL
H-2-35850	PLOT PLAN
N-2-3402	PLOT PLAN

REFERENCES

NEXT USED ON ES-050051-C2, SH9

REV NO	DESCRIPTION	REV BY DATE	CHKD	COMPANY
1	REVISE PER ENGR COMMENTS	PAL 3/6/		

REVISIONS

METRIC

NAME — DATE — COMPANY — SIGNATURE — PRINT

DRAWN BY WH CROWLEY JR

DESIGN AUTHORITY

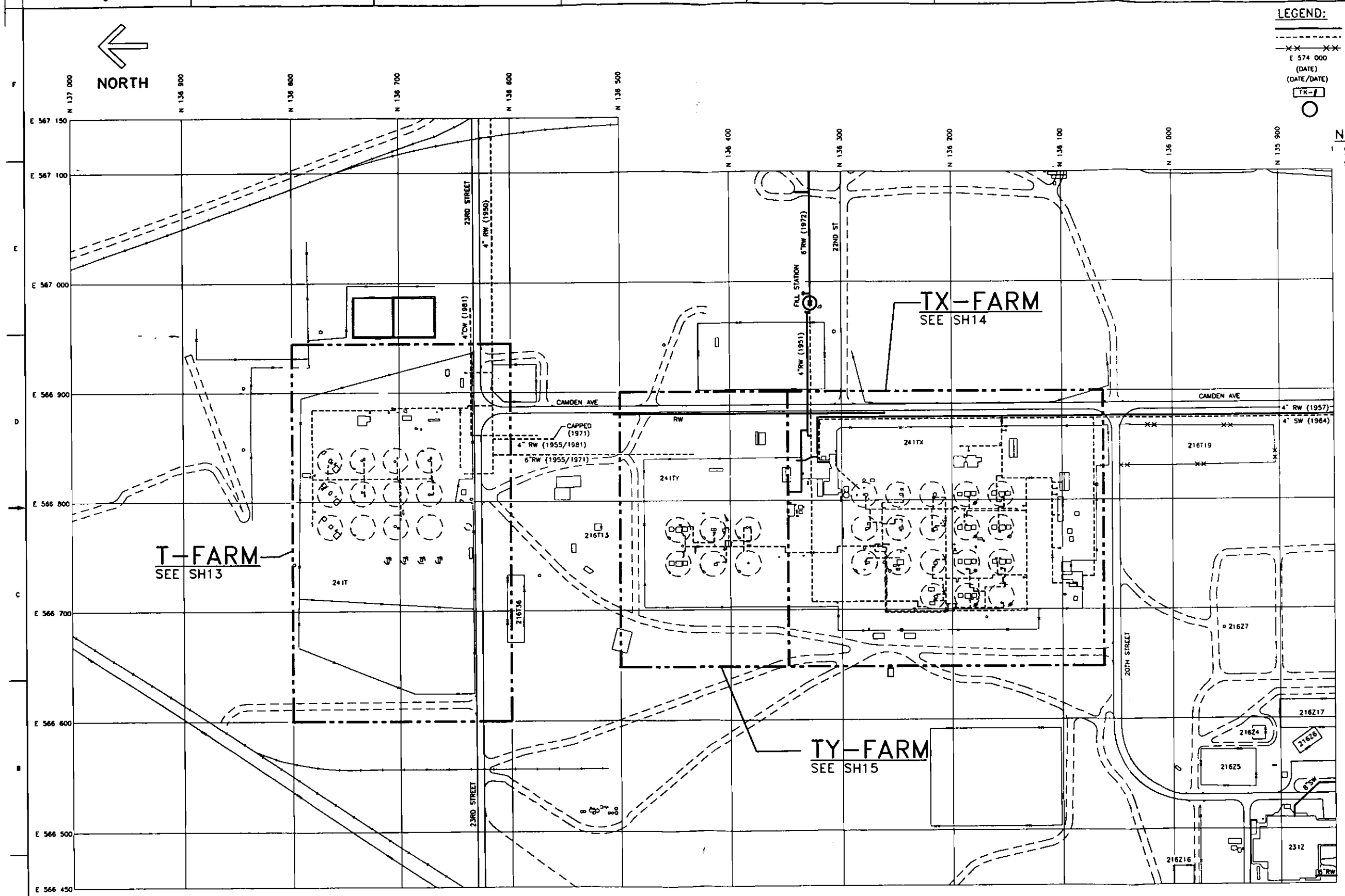
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL /ENVIR
WATER LINES
241-SX TANK FARM

SIZE F — SCALE NO 200W — SHEET NO — DWG NO ES-050051-C2 — REV 1

SCALE 1:400 — SHEET 11 OF

RPP-5002,REV.1



LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-# — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-T TANK FARMS

DWG NO	TITLE	REF NUMBER	TITLE
		REFERENCES	
DRAWING TRACEABILITY LIST		NEXT USED ON	

REV	DESCRIPTION	REV BY	ENGR	ENGR COMPANY
1	REVISE PER ENGR COMMENTS	PAL 3/6/1		

REVISIONS

METRIC

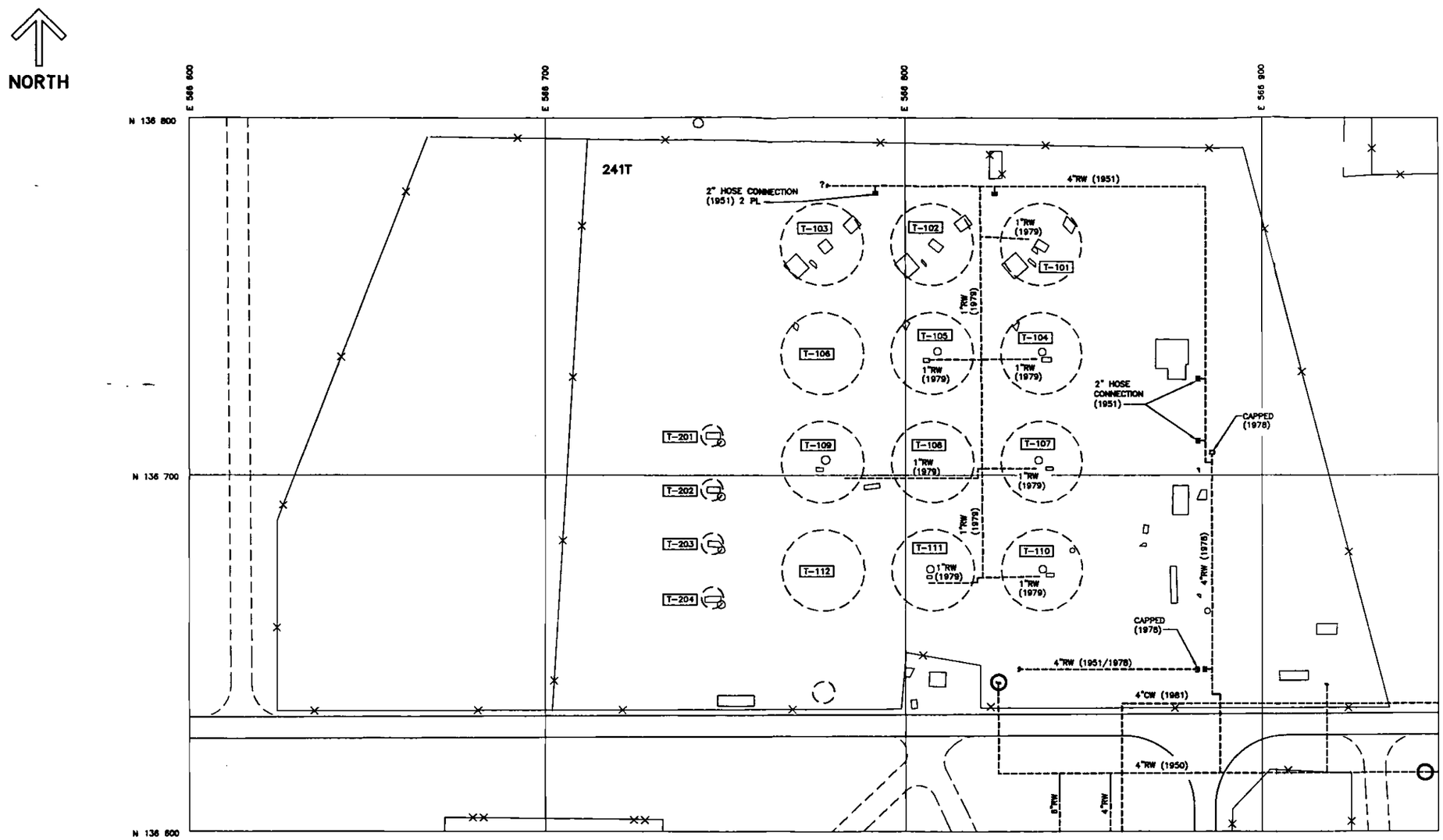
NAME	SIGNATURE	DATE
WH CROWLEY JR		5/16/96

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIR
WATER LINES
241-T TANK FARMS

SIZE	FILE NO	CODE NO	DWG NO	REV
F	2005 T-FARM		ES-050051-C2	1

SCALE 1:1000 SHEET 12 OF



241-T FARM

LEGEND:

———	WATER LINE (ACTIVE)
- - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-#	TANK NUMBER
○	POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DWG NO	TITLE
H-2-73978	PIPING & INSTM PLAN 241-T TK FARM
H-2-73969	ENGRG FL DIA 241-T & TY TK FARM
H-2-73903	PIPING PLAN
H-2-7305	PIPING WTR TK ISNL 241-T-101
H-2-73052	PIPING WASTE TK DIAG 241-T & TY TK FARM PUMP PLANS
H-2-70836	PIPING CONTROLLED WTR 241-T TK FARM
H-2-44511	AREA MAP 200W "T" PLANT FACIL
H-2-42678	PIPING ARRGT OUTSIDE UTIL LINE
H-2-42633	ARCH PLOT PLAN, SH 2
H-2-38538	SAN & RW MAP 200W AREA
H-2-3020	WASTE LINE 241-T-112 TK TO 241-TX-3 CRIB
H-2-2222	WASTE DISPOSAL FACIL 200 WEST AREA

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
NEXT USED ON ES-050051-C2, SH12	REFERENCES

REV	DATE	DESCRIPTION	BY	CHK	APP
1		REVISE PER ENGR COMMENTS	PWL 5/6/1		

REVISIONS

METRIC

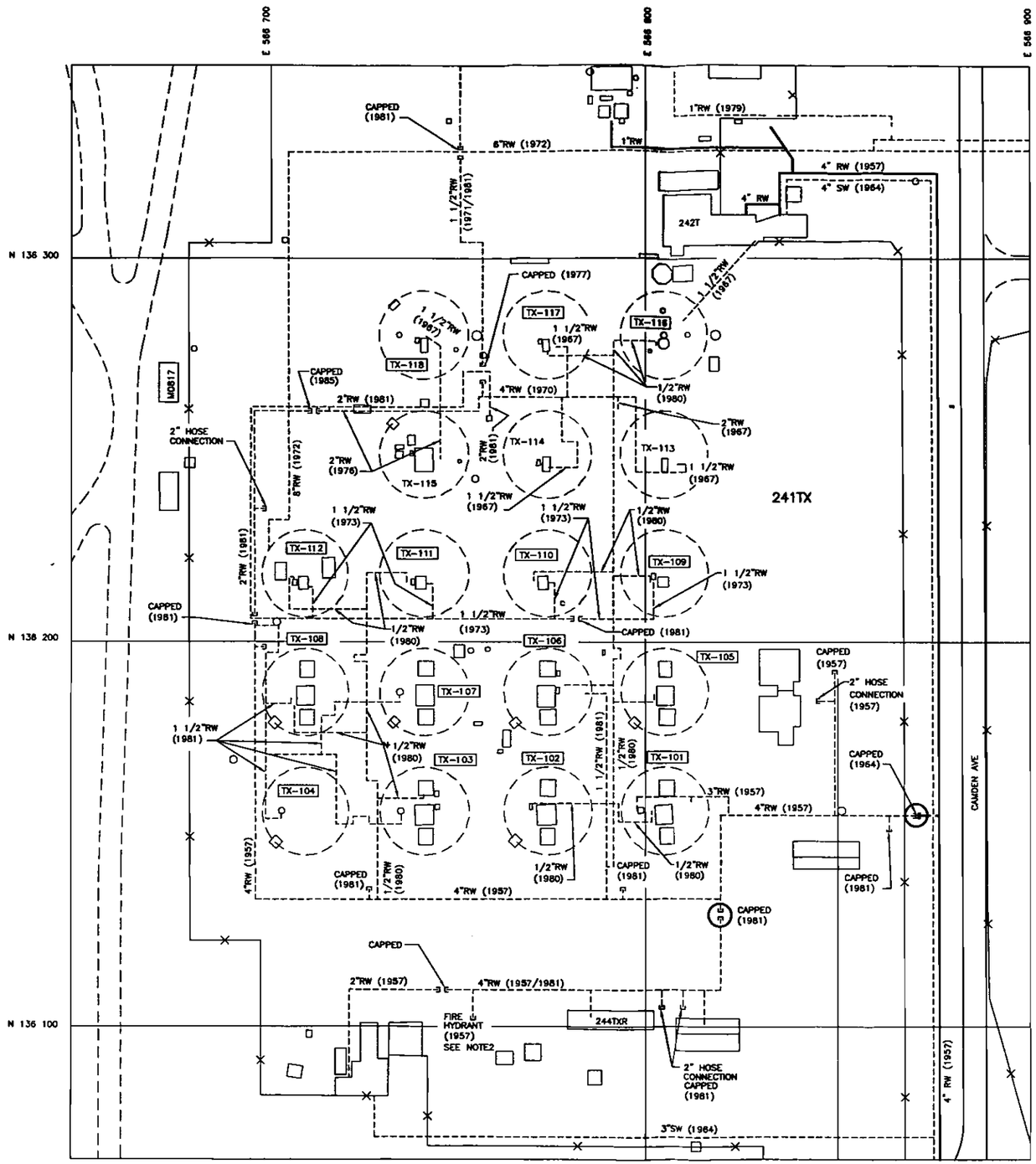
NAME	SIGN	DATE
WH CROWLEY JR		

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIR
WATER LINES
241-T TANK FARM

F | 2000 | ES-050051-C2 | 1

SCALE 1:500 | SHEET 13



LEGEND:

———	WATER LINE (ACTIVE)
- - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-#	TANK NUMBER
○	POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.
2. FLOW TEST FIRE HYDRANT TO VERIFY ACTIVE LINE.

241-TX FARM

REF NUMBER	TITLE
H-2-93237	WTR SUPPLY LINE PLAN & DET
H-2-73985	PIPING & HOSE PLAN & DET 241-TY TK FARM
H-2-73969	ENGRG PL DIA 241-T & TY TK FARM
H-2-73801	PIPING PLAN & DETAILS
H-2-73052	PIPING PLAN TK 241-T & TY TK FARM

REFERENCE

REF NUMBER	TITLE
H-2-70840	PIPING CONTROLLED WTR 241-TY TK FARM
H-2-44511-128	AREA MAP 200W "T" PLANT FACIL
H-2-44511-118	AREA MAP 200W "T" PLANT FACIL
H-2-42070	PIPING ARRGT OUTSIDE VAR LINES, SH/1
H-2-36536	SAN & RW MAP 200W AREAQ
H-2-36314	PIPING PLANS TK 241-TY-101, 102, 103 & 104

REFERENCE

DWG NO | TITLE

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-36311	PIPING PLOT PLAN 241-TY TK FARM
H-2-36309	ENGRG PL DIA TK 241-TY-102, 104 & TX-108
H-2-36308	ENGRG PL DIA TK 241-TY-101 & 103
H-2-34961	SKID MOUN PUMP PIT 241-TY-105 PLAN PLAN & DET
H-2-2283	UTIL FACIL TEMP & PERM PLOT PLAN
H-2-2223	WASTE DISPOSAL FACIL TEMP 200W AREA GEN LAYOUT
H-2-2222	WASTE DISPOSAL FACIL 200W AREA

REF NUMBER | TITLE

REFERENCES

NEXT USED ON ES-050051-C2, SH12

REV NO	DESCRIPTION	APPD	DATE
1	REVISE PER ENGR COMMENTS	PAL	3/8/1

REVISIONS

METRIC

NAME	DATE
WH CROWLEY JR	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIR
WATER LINES
241-TX TANK FARM

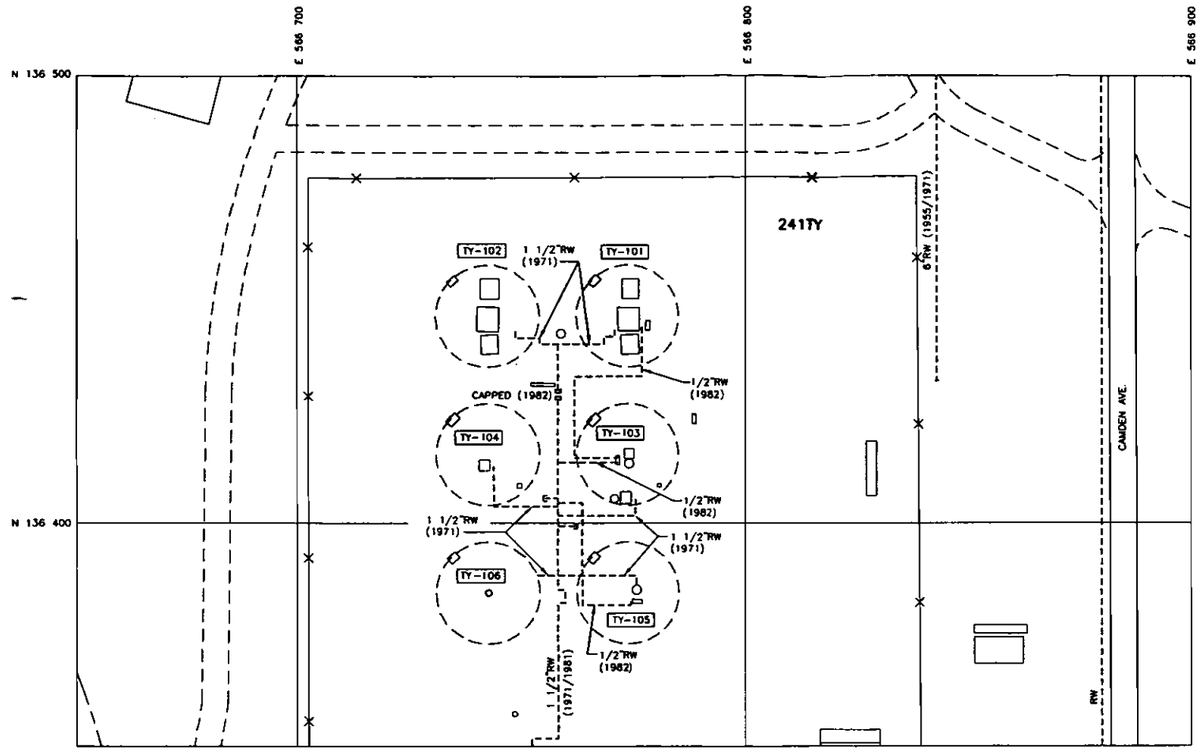
F | 200W TY-200W | ES-050051-C2 | 0

SCALE 1:500 | SHEET 14 OF

Page T-C-14

RPP-5002,REV.1

NORTH



241-TY FARM

LEGEND:

———	WATER LINE (ACTIVE)
- - - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE
TK-#	TANK NUMBER

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

REF NUMBER	TITLE
H-2-97702	200W AREA WTR & SREAM MAP NORTH SECT
H-2-97701	200W AREA WTR & SREAM MAP NORTH SECT
H-2-73112	PIPING WTR TK ISLN 241-TX FARM PLOT PLAN
H-2-70857	PIPING & INSTM PLAN & DET 241-TX TK FARM
H-2-70856	PIPING & INSTM PLAN 241-TX TK FARM
H-2-70854	ENGRG FL DIA SALT WELL SYS
H-2-70838	PIPING CONTROLLED WTR 241-TX TK FARM
H-2-44511-118	AREA MAP 200W "T" PLANT FICAL
H-2-44511-110	AREA MAP 200W "T" PLANT FICAL
H-2-42070	PIPING ARRGT OUTSIDE UTIL LINES, SH1
H-2-36634	CIVIL PLAN & PF 6"RW SPLY LINE TO 241-TX-112
H-2-36633	CIVIL PLAN & PF 6"RW SPLY LINE TO 241-TX-112

REFERENCES

DWG NO	TITLE

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-36602	PIPING PLOT PLAN 241-TX-112
H-2-36601	BOX COOLER ENGRG PROS FL DIA 241-TX-112
H-2-36536	SAM & RW MAP 200 WEST AREA
H-2-36313	PIPING PLANS TK 241-TX-103, 104, 107 & 108
H-2-36310	PIPING PLOT PLAN 241-TX TK FARM
H-2-36307	ENGRG FL DIA TK 241-TX-102, 103, 105 & 109
H-2-36306	ENGRG FL DIA TK 241-TX-104, 106, 107 & 108
H-2-35885	PIPING PLOT PLAN & DWG INDEX
H-2-35884	ENGRG FL DIA TK 241-TX-102, 105 & 106
H-2-35203	PIPING PLOT PLAN MOD OF 241-TX TK FARM
H-2-35202	ENGRG FL DIA TK 241-TX-110, 111, 112, 115 & 116
H-2-33451	PLOT PLAN & FL DIA 241-TX TK FARM

REFERENCES

NEXT USED ON ES-050051-C2, SH12

REV	DESCRIPTION	BY	DATE	ENGR	CHECKER
1	REVISE PER ENGR COMMENTS	PAL	3/6/1		

REVISIONS

METRIC

NAME: WM CROWLEY JR

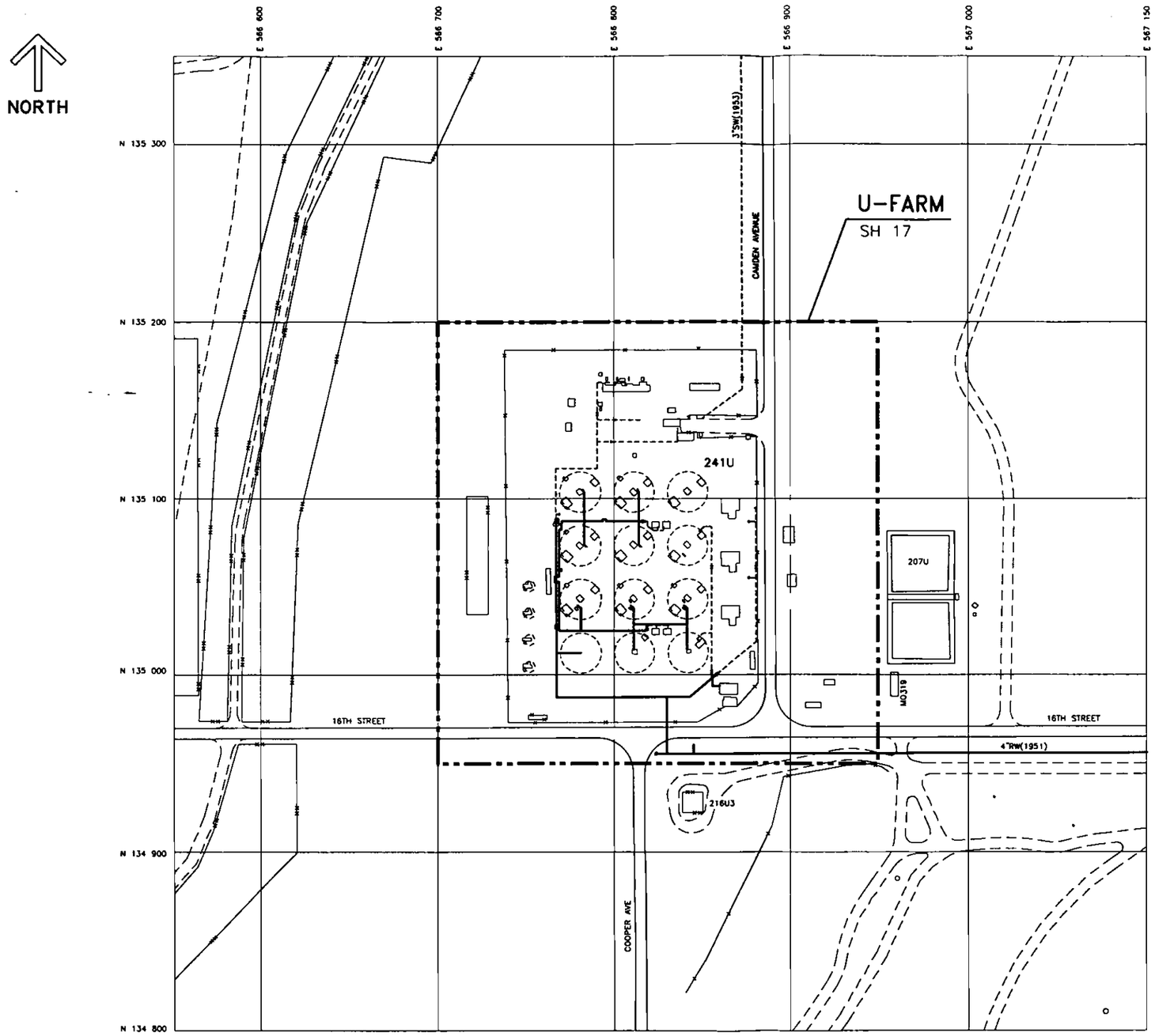
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIR
WATER LINES
241-TY TANK FARM

SIZE F | 200W TX-FARM | ES-050051-C2 | REV 1

SCALE 1:500 | SHEET 15 OF

DWG NO ES-050051-C2 | REV 1



241-U FARM

LEGEND:

———	WATER LINE (ACTIVE)
- - - - -	WATER LINE (ABANDONED)
—XX—XX—	FENCE
E 574 000	LAMBERT COORDINATES (METERS)
(DATE)	INSTALLATION DATE
(DATE/DATE)	INSTALLATION/ABANDONED DATE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

REF NUMBER	TITLE
H-2-97702	200W AREA WTR & ST MAP MOL SECT
H-2-93621	PIPING CONTROLLED WTR 241-U TK FARM
H-2-73917	PIPING PLANS & SECTIONS
H-2-73706	PIPING & INSTM PLAN & SECT 241-U FARM
H-2-73705	PIPING & INSTM PLAN & SECT 241-U FARM
H-2-73703	ENGRG FL DIA SALT WELL SYS
H-2-70841	PIPING CONTROLLED WTR 241-U TK FARM
H-2-44511-70	AREA MAP 200W "U" PLANT FACIL
H-2-44511-62	AREA MAP 200W "U" PLANT FACIL

REFERENCES

DWG NO	TITLE
H-2-44004	216-B-3 CRIB RET, 241-A 5" COND WTR & 6"RW PIPING
H-2-40265	PIPING ABRGT OF OUTSIDE UNL LINES S4W1
H-2-37344	PIPING PLAN 241-A TK FARM RIS 100, 101, 102, 110 & 111
H-2-37343	PIPING PLAN 241-A TK FARM RIS 102, 103, 105 & 106
H-2-37048	REMOVAL OF 271-UR BLDG & ASST PIPING REPLACEMENT
H-2-36805	SALT WELL INSLN TK 112-U
H-2-36536	SAN & RW MAP 200W AREA
H-2-2469	200W AREA WTR LINE PLOT PLAN

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
NEXT USED ON	REFERENCES

REV NO	DESCRIPTION	REV BY DATE	CHKD	COMPANY
1	REVISE PER ENGR COMMENTS	PAL 3/6/1		

REVISIONS

METRIC

NAME	DATE	COMPANY
WH CROWLEY JR	6/1/99	FDNW

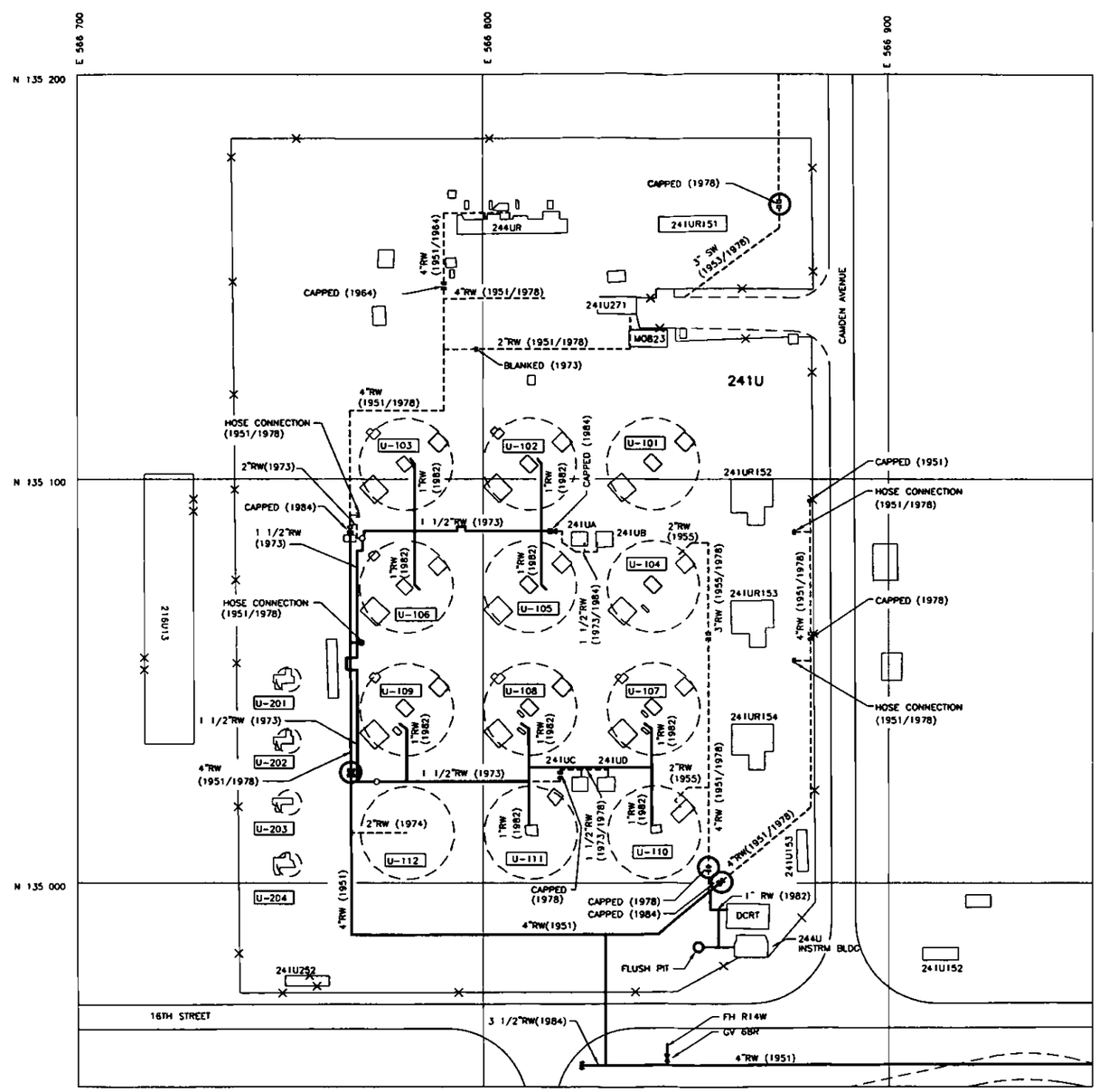
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL /ENVIR
WATER LINES
241-U TANK FARM

SIZE	BLDG NO	SHEET NO	DWG NO	REV
F	200W U-FARM		ES-050051-C2	1

SCALE 1:1000 SHEET 16 OF

DWG NO ES-050051-C2 SH 16 OF REV 1



241-U FARM

LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- FENCE
- E 574 000 — LAMBERT COORDINATES (METERS)
- (DATE) — INSTALLATION DATE
- (DATE/DATE) — INSTALLATION/ABANDONED DATE
- TK-# — TANK NUMBER
- POTHOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON ES-050051-C2, SH16	

REV NO	DESCRIPTION	REV BY	DATE	CHECK	ENGR	COMPANY
1	REVISE PER ENGR COMMENTS	PAL	3/6/1			

REVISIONS

METRIC

NAME	DATE	SIGNATURE
WH CROWLEY JR	4/1/98	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIR
WATER LINES
241-U TANK FARM

SIZE	FSCM NO	DWG NO	REV
F	2006 U-FARM	ES-050051-C2	1

SCALE 1:500 SHEET 17 OF

ATTACHMENT II

WELL ASSESSMENT

ENGINEERING STUDY

ATTACHMENT II

WELL ASSESSMENT FOR SINGLE-SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

March 2001

Subcontract LMHC 96WO-0006

Prepared by

Fluor Federal Services
Richland, Washington

Prepared for

CH2M HILL Hanford Group, Inc.

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ENGINEERING STUDY

WELL ASSESSMENT FOR SINGLE SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

1.0 INTRODUCTION

Operations activities within the Hanford Site single-shell tanks (SST) farms, located at the 200-East and 200-West Area, have contributed to contamination of the soil above, around, and below the SSTs. A layout of the Hanford Site is shown in Figure 1-1. Studies have shown that any water added to the soil column contributes to the continued migration of this contamination through the vadose zone into the groundwater.

This engineering study report identifies and evaluates alternatives for reducing or eliminating the number of monitoring wells within the SST farms. The wells present a potential pathway for expediting contamination into and through the vadose zone and into the groundwater. This study, in conjunction with two related studies on the evaluation of the water lines and surface water control within the SST farms, will provide a basis for interim remedial actions to substantially reduce water and contamination migration through the vadose zone. These combined studies support TPA milestone P (M)-45-56-T01, as created by change request M-45-98-03.

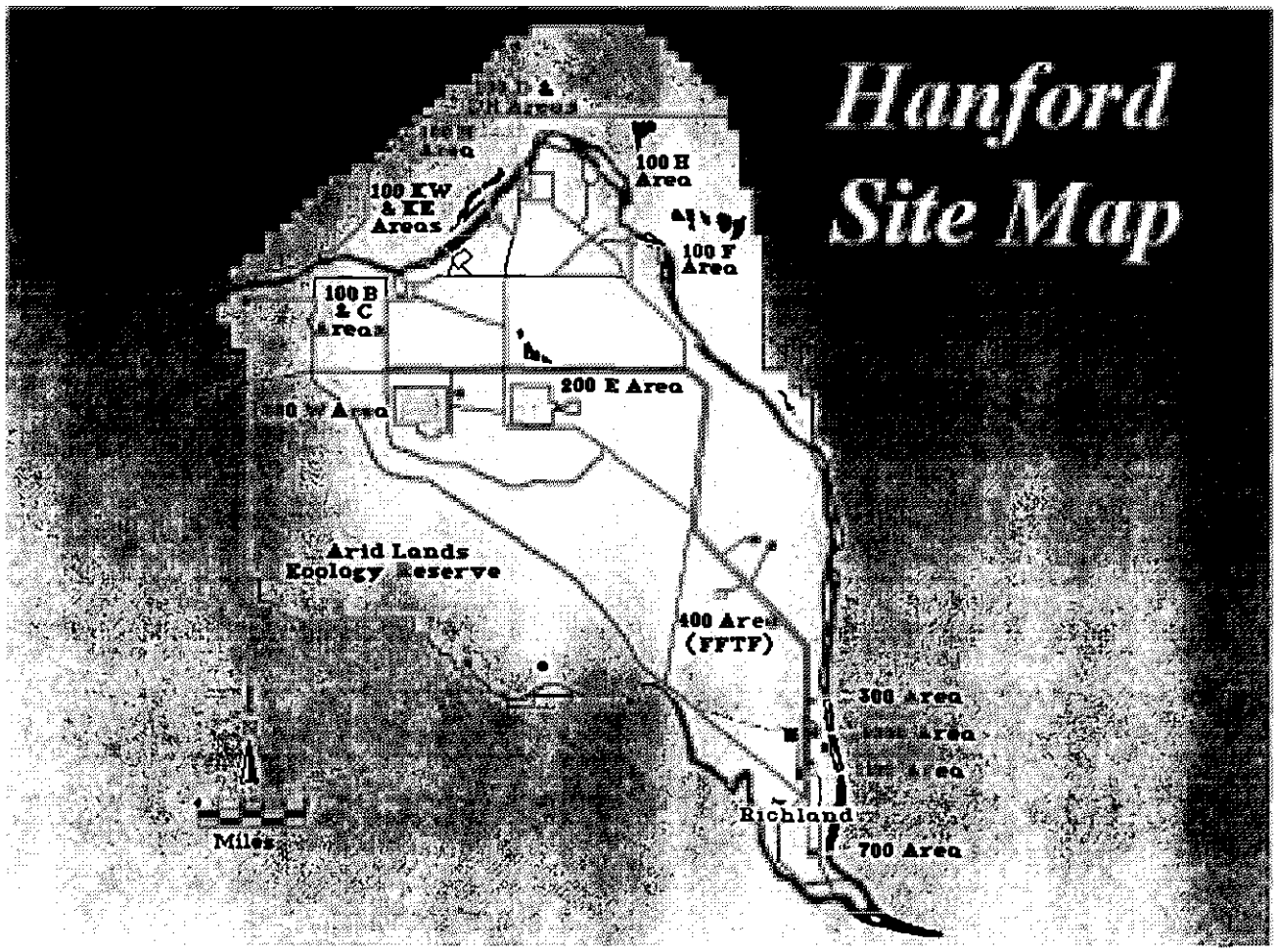

Figure 1-1. **Hanford Site Map**

2.0 SUMMARY AND CONCLUSIONS

This engineering study assesses 847 wells located in the SST farms for decommissioning. The majority of the monitoring wells were constructed between 1944 and 1984, with a few more installed since that date. These wells may provide a preferential pathway for contaminant migration to the groundwater. Historic Hanford Site records, including initial drillers logs and current spectral gamma ray logs, were reviewed to determine well construction and irregularities. Information from this research was tabulated on spreadsheets that identify each well by SST farm and number (see Appendix G). Each well location and priority for decommissioning are shown on engineering sketches in Appendix H.

The wells were separated into 15 different types ranging from groundwater wells and vadose zone wells to abandoned wells. Each well type was evaluated against Washington Administration Code (WAC) 173-160, Minimum Standards for Construction and Maintenance of Wells. This evaluation proved the general consensus that most of the wells are noncompliant with WAC 173-160. Sketches of the different well construction types are included in Appendix A. There are a number of different well configurations. To support this study, the different configurations are separated into different types and defined in Appendix A. The wells were also grouped by farm and by function to aid in the evaluation process. The two primary configurations are groundwater wells (those that intercept groundwater) and vadose zone wells (those that don't reach groundwater). The vadose zone wells are grouped into vadose zone wells, deepened vadose zone wells, and double-casing vadose zone wells.

Lateral boreholes, a part of the leak detection system in A and SX Tank Farms, are not included as part of this study.

Based on its condition, each well was assessed for fitness for use. This assessment evaluated if the wells could provide useful information during future waste retrieval. Based on this assessment, the wells were separated into four decommissioning categories. Thirteen wells are already decommissioned per WAC 173-160 and require no further action. The sixty-two Priority 1 wells are the wells that present the highest risks to the groundwater and are the first priority for decommissioning. Many of these wells go to groundwater or are in high risk locations. They include groundwater wells, abandoned wells, and vadose zone wells. Sixty Priority 2 wells are vadose zone wells that present a high risk to the groundwater, but their location relative to the tanks limits their use for monitoring during SST waste retrieval activities. These are the second priority for decommissioning. Seven hundred and twelve Priority 3 wells are vadose zone wells, located around the perimeter of the SSTs, which also present a high risk to the groundwater. However, these wells could provide vadose zone contamination monitoring during ongoing operations and waste retrieval activities. Priority 3 wells are the last identified for decommissioning.

The first action recommended is to request a variance from WDOE in accordance with WAC 173-160. This provides the State with the status of all wells in the SST farms and brings all wells into compliance with Washington State regulations. Specific steps for requesting a variance are contained in WAC 173-160-106.

The recommendation for decommissioning the wells is to perforate and then pressure grout the casing. The preferred method for perforating the well casings is Alternative 2C, jet shot process (see Section 5.2.4). This method has been used on the Hanford Site and meets Washington State requirements. Well decommissioning would be completed by pressure cement grouting the perforated casing. Although the jet shot method uses explosives in the perforation process, available normal industry construction techniques would minimize perceived hazards. However, approval for the use of explosives would still be required.

The wells were further evaluated for future potential use in vadose zone testing, such as, soil sampling or cross-borehole partitioning inter-well tracer testing (PITT). This evaluation concluded that wells within Priority 1 and 2 and those already decommissioned are not candidates for PITT or soil testing. The vadose zone wells in Priority 3 are the desirable candidates for special testing. Perforated vadose zone wells (refer to Attachment II, Appendix A, types C, C1, D, E, and F) would be useful for PITT, because all the SST farms, except T Tank Farm, have a large number of these types of wells available. Vadose zone wells with increased contamination, as detected by the spectral gamma ray logging, have been identified for soil sampling. Wells recommended for PITT and vadose zone soil sampling and the depths for monitoring in each well are identified in the tables in Appendix C.

The estimated cost to decommission a groundwater well is approximately $26,000, and the cost to decommission a vadose zone well is approximately $20,000. Each well would take an estimated 2 days (2 shifts total) to decommission. These costs and the schedule are based on using the jet shot perforating method, Alternative 2C. Complete cost estimates are shown in Appendix E.

3.0 APPROACH/EVALUATION

It was difficult to determine the number, size, and depth of wells, within the confines of the SST farms. Depending on the source, the numbers varied considerably. The initial investigation determined that there were two distinct types of wells. The first type includes those wells that penetrate to the groundwater, hereafter referred to as groundwater wells. The second type, sometimes referred to as a dry well, is of various depths but does not intercept the groundwater and is referred to as a vadose zone well. The initial phase of the investigation also determined the appropriate number, size, depth, and configuration of the casings, using various approaches, such as:

- Develop well spreadsheet
- Develop engineering sketches of tank farm and well locations
- Site visits and interviews
- Review of historical records.

3.1 WELL SPREADSHEET

A spreadsheet was developed to identify all the wells and related physical data within each tank farm (see Appendix G). Information was obtained from the Hanford Well Reports, referenced in Section 10.0. The spreadsheet currently includes information on 847 wells, including the well designation numbers, coordinates in both Hanford and the state Lambert systems, diameter and depth, the date of installation or deepened, the type of well, various comments from the Hanford Well Reports and the drillers' logs and gamma log reports, and the time sequence when the various wells were identified in the Hanford Well Reports. The well designation has evolved from the initial site number (299-E25-061), to a scattering of miscellaneous numbers (241-A-1, EMA-2384, and IBM-2384), to a tank farm number (10-04-01), and currently to a Washington State number (A6500).

Well diameters were tabulated from the Hanford Well Reports, the drillers' logs and well completion records, the spectral-gamma logging reports, a listing developed by the site well services group, and records from a recent well capping contract. The depths were tabulated from the Hanford Well Reports, the drillers' logs and well completion records, and from the spectral-gamma logging reports. A final casing diameter and depth was recorded on the spreadsheet.

These dimensions were used to develop the various alternatives, costs, and to assess implementation measures.

The spreadsheet generally does not include wells outside the tank farm fenced areas, unless they are considered important due to the risk associated with them. Twelve RCRA wells installed by Bechtel Hanford in FY 2000 are all outside fenced areas and are not included in the spreadsheet.

3.2 SINGLE-SHELL TANK FARM WELL ENGINEERING SKETCHES

Detailed engineering sketches were prepared for each tank farm. These sketches show the general layout of the SST farms and show physical features (fences, buildings, tanks, cribs, etc.) for each farm. The drawings show the location of each well identified on the spreadsheet, and tabulate the well numbers, diameter, depth, date installed, type and priority for decommissioning. Sketch ES-050051-C3, sheets 1 through 12 show each tank farm (see Appendix H). Hanford Site drawings and engineering change documents were also used to develop the sketches. Numerous drawings were used in the evaluation of the tank farm wells and are listed in reference Section 11.3, Drawings and Sketches.

3.3 SITE VISITS AND INTERVIEWS

Each SST farm was observed to understand the orientation of the tanks and wells. Numerous operations and engineering personnel were interviewed to understand current and projected waste pumping, and retrieval activities. Interviews were conducted with personnel from Numatec Hanford Corporation (NHC), Bechtel Hanford, Incorporated (BHI), CH2M HILL Hanford Group, Inc. (CHG), CH2M Hill, Inc. (CHI), Pacific Northwest National Laboratory (PNNL), Waste Management Federal Services, Inc., Northwest Operations (WMNW), MAC Technical Services Company Environmental Restoration Services, Inc. (MACTEC-ERS), and the Washington State Department of Ecology (WDOE). Current aerial photos of the farms were also used (Attachment III-Appendix C).

The primary contacts included Jim Adrian, Ken Drakulich, Kevin Hull, Lee Dougherty, Rebecca Raven, Dan Niebuhr, and Dave Barnes. Information obtained included:

- Two new wells in SX Farm adjacent to tanks SX-109 and SX-112

- Decommissioned wells in TY Farm during the control, clean, and stable activities
- Problems locating wells within the farms
- The use of wells around tank C-106 during sluicing, pumping and retrieval activities, and wells used in the RCRA monitoring of the groundwater
- 12-in. dry vertical storage holes in west tank farms
- The use of vadose zone wells for leak detection of the SSTs, and monitoring of contamination migration.
- The decommissioning of four vadose zone wells was completed during FY 2000. (These are outside the fenced areas and are not shown on the spreadsheet).

John Reeves of NHC indicated that the current baseline for retrieval is based on past practices at the tank farms.

Jim Bertsch, MACTEC-ERS, provided information concerning the spectral gamma ray logging of the wells. Bertsch provided copies of the Hanford Tank Farm Vadose Reports. Bertsch indicated that the wells could be useful for leak detection and contamination migration monitoring during future retrieval activities. Vern Johnson and others from PNNL explained the history of the Hanford Well Reports.

Karl Fecht of BHI worked on the Hanford Site wells from the late 1960's until the early 1980's. Fecht described the "Webster Completion" as a process where construction workers placed a cement grout seal around the top 20 ft of the casing and poured a cement grout plug at the bottom. The Webster Completions were installed in the late 1970's. John Auten, with CHI, identified well problems and well types. Auten identified that some of the old wells used a light-gauge metal casing while other wells may have a double casing. The light-gauge casings have deteriorated so that decommissioning by pulling the casing would be nearly impossible. Standard mechanical methods of perforating will not work on the double-casing wells. If pulling the casings is not possible, a jet-shot (explosive) process may be required for decommissioning. Auten stated that this process has been used on site in the past.

Marty Gardner, Scott Worley, and Aaron Schatz, WMNW, provided information regarding the original well drillers log. The well responsibility is now divided between CHG for the wells in the tank farms and BHI for the remainder. WMNW provided copies of the drillers' logs, and the well completion records. Gardner indicated that a report prepared in the early 1980's listed the wells that had received the Webster Completions, but this report could not be located. None of the SST farm wells meet Washington State well criteria, WAC-173-160. There could be a gamma-logging problem if the well casings were grout-sealed in accordance with state requirements.

Rick McCain, MACTEC-ERS, who has been involved with the spectral gamma ray logging of the SST farm wells, clarified the potential problem with grouting the casing. McCain stated that the concrete or any additional material placed in or around the well provides shielding to the gamma probe. If the condition is identified, i.e., 4-in. casing grouted in the 6-in. casing as in T Farm, this can be factored into the data collection and therefore does not present a problem. The concrete seal on the outside of the casing probably would not have a constant thickness but this also can be accounted for in the data collection.

Stan Leja, WDOE, a hydrogeologist identified the Washington State regulations and well requirements: *Water Well Construction Act,* RCW 18.104; *Minimum Standards for Construction and Maintenance of Wells*, WAC 173-160; and *Dangerous Waste Regulation*, WAC 173-303. Leja agreed that the wells are noncompliant, but with the baseline spectral gamma-ray logging and reports, the wells could provide a means to detect tank leaks and monitor vadose zone contamination migration activities during retrieval activities. Leja indicated that a variance on the wells could be submitted and approved for this monitoring activity.

3.4 HISTORICAL HANFORD SITE DOCUMENTS

Historical Hanford Site documents were used to verify the drilling methods used and the configuration of the wells. Initially, this review included the drillers' and geological logs generated at the time of well construction, the well completion records, and the resource protection well inspection reports. The drillers' log generally provided the depth and sometimes the casing diameter of the wells. The well completion records normally would show the well

configuration (depth, casing size, etc.). Washington State did not require well completion records before 1973, and it wasn't until several years later that the Hanford Site complied with the state requirement. Many drillers' logs were obtained, but only a few of the well completion and resource protection records were found. Copies of these records were obtained from MACTEC-ERS, PNNL, and WMNW. The spectral gamma-ray log well information furnished field measurements of well depth and casing diameters. Copies of the spectral gamma-ray log well information were obtained from MACTEC-ERS.

Historical contract documents provided the well construction requirements, such as, location; casing size and schedule; depth; surface, strata, and bottom sealing requirements; and logging requirements. Two historical contract specifications, HWS-8158 (1961) and HWS-8237 (1963), and current records, 1985 and newer, were found, but those from the later 1960's through the 1970's were not located. Other documents researched to help verify well configuration include the *Hanford Well Custodians*, WHC-SD-EN-DP-071, and the *Summaries of Well Construction Date and Field Observations for Existing 200-E Resource Protection Wells*, WHC-SD-ER-TI-007.

3.5 ASSUMPTIONS, CONSTRAINTS, AND REQUIREMENTS

The applicable constraints, requirements, and assumptions are critical to the successful resolution of the well assessment issue. These items provide the framework and boundary limits for determining and implementing the actions recommended within this study.

3.5.1 Assumptions

The following are the assumptions identified as critical to the resolution of the well assessment issue.

- The scope of the study includes all wells within the fenced area of the tank farms, including those wells located between adjacent tank farms or those located immediately adjacent to the fence boundaries. Lateral boreholes, a part of the leak detection system in A and SX Tank Farms, are not included as part of this study.

- The retrieval phase for each tank farm will require well monitoring, similar to that implemented during the retrieval operations for Tank 241-C-106.

- Within the tank farms, materials removed during decommissioning or construction would be reused where possible, within the boundaries of the tank farm. Any highly contaminated materials encountered will be removed from the farm.

- All alternatives shall support future retrieval and D&D activities, such as providing monitoring capabilities through the use of existing wells.

- Priority 3 wells should be decommissioned after potential monitoring needs have been fulfilled.

3.5.2 Constraints

Constraints are requirements imposed by an external organization. Following are the guidelines and specifications for safe design, construction, and operation and maintenance activities associated with the tank farm well assessment. These constraints are critical to the successful completion of the tank farm well assessment effort.

- DOE Order 5820.2A *Radioactive Waste Management*
- DOE Order 5480.28 *Natural Phenomena Hazards Mitigation*
- RPP-PRO-097 *Engineering Design and Evaluation*
- WAC 173-303-640 *Dangerous Waste Regulations, Tank Systems*
- HNF-SD-WM-SAR-067 *Final Safety Analysis Report*
- HNF-SD-WM-TSR-006 *Technical Safety Requirements*
- HNF-5183 *Tank Farms Radiological Control Manual*
- RPP-PRO-1622 *Radiological Review Process*
- WAC 173-160 *Well Construction and Decommissioning*

3.5.3 Requirements

The following requirements apply to all remedial actions associated with the final recommendations of this well assessment study. The requirements have been identified as critical to the successful completion of the tank farm well assessment effort.

- Provide a substantial reduction in the number of wells providing pathways for contaminant transport through the vadose zone into the groundwater.

- Dome loading on the tanks shall be limited by the static dome loading design limits specified in OSD-T-151-00007 and HNF-IP-1266, Chapters 5 and 6.

- Maintenance and operations activities involving the wells should be minimized or eliminated by any recommended actions.

4.0 DECISION CRITERIA

Decision criteria used to distinguish between the alternatives represent a mixture of quantitative and qualitative factors. These criteria have been established to evaluate the potential advantages and disadvantages associated with implementing a given alternative. Some of the criteria, such as cost, represent directly measurable variables while other criteria, such as operability, are much more dependent on the judgement of experienced engineers. The criteria are not all-inclusive or detailed in scope. They represent a wide range of safety, social, and economic issues that permit the screening of potential alternate technologies for acceptability. The alternatives will be analyzed to select those deemed to have the greatest possibility for successful implementation.

4.1 SAFETY AND HEALTH

Public and worker safety and health is of prime concern and a positive and active effort must be included in all work to reduce hazards to a minimum consistent with accepted practices and regulatory requirements. CHG's "Safe Project Delivery" program implemented in August 2000, supports the emphasis on safety issues a criterion.

4.1.1 Public Safety

Protection of the general public from Hanford Site hazards is of paramount importance and any safety problem with an impact beyond the confines of the controlled portion of the site is considered a public safety issue.

4.1.1.1 Radiation Releases

Releases where radioactivity is the principal hazard

a. Chronic releases: Small continual releases associated with normal operation.

b. Accidental releases: Unplanned releases due to equipment malfunction or operator error.

4.1.1.2 Nonradioactive Releases.

Releases with radiation below the allowable limits where the principal hazard is chemical compounds.

4.1.2 Worker Safety

Worker safety is a critical aspect of all jobs on the Hanford Site and must receive careful consideration. Worker safety pertains to individuals working directly with the equipment or in adjacent areas including all personnel within the confines of the controlled portion of the Hanford Site.

4.1.2.1 Radiation Exposure

a. Chronic Exposure: Exposure associated with the day-to-day operation and maintenance. This type of exposure should be minimized by implementation of the ALARA program. Contact operation and maintenance of radioactive equipment should be avoided where possible and remote techniques should be utilized.

b. Accidental exposure: Unplanned exposure due to equipment malfunction or operator error. Applying engineering controls and radiation barriers should minimize these exposures.

4.1.2.2 Chemical Exposure.

The exposure to hazardous chemicals should be eliminated where possible, and where not possible, should be reduced to acceptable regulatory standards.

4.1.2.3 Industrial Safety.

Industrial safety is the consideration of normal construction hazards such as tripping, falling, improper use of tools, working in proximity to heavy equipment, electrical shock, etc. Industrial safety includes most hazards normally associated with construction, maintenance and operation of plant facilities, and equipment.

4.1.3 Environmental Safety

Environmental safety is the evaluation of the alternatives versus how the construction, operation, and maintenance could affect the environment.

4.1.3.1 Protection of the Biota.

Protection of the flora (plant life) and fauna (animal life).

4.1.3.2 Groundwater Protection.

Construction, operation, or maintenance activities that produce any hazardous liquid or material that constitute a threat to groundwater if it is not properly controlled. This could include unplanned releases due to equipment malfunction or operator error.

4.1.3.3 Atmospheric Protection.

Construction, operation, or maintenance activities of the alternative that release hazardous gases or volatile liquid. Will the activity contribute substantially to blowing dust possibly carrying radionuclide that could affect air quality? Will the alternate generate releases associated with the day-to-day operation and maintenance or unplanned releases due to equipment malfunction or operator error?

4.2 REGULATORY COMPLIANCE

All work and equipment shall comply with applicable U. S. Department of Energy (DOE) orders, Washington State statutes, and Environmental Protection Agency (EPA) regulations. The regulatory compliance decision criteria include consideration of regulatory compliance, permitting, and complexity issues. Permitting requirements should be evaluated based on the following factors: (1) number of permits required or modified, (2) complexity of required permitting documentation, (3) potentially required permits or approvals that are unique to the system being examined, (4) regulatory obstacles, and (5) impacts of permitting activities on the project schedule.

4.3 LIFE-CYCLE COST

To the extent practical, the system, equipment, or component will be evaluated with respect to capital, operating, and decontamination/decommissioning life-cycle costs.

4.3.1 Capital Cost

Includes all costs for design, construction, and incidentals for the facility or equipment.

4.3.2 Operating Cost

Includes normal costs associated with the day-to-day operation and maintenance of equipment or facility.

4.3.3 Decontamination and Demolition

All costs for final cleanup, demolition, and disposal of equipment or facility.

4.4 TANK INTEGRITY

The SSTs have exceeded their original design life, and information regarding the physical condition of the tank structure is limited. Potential structural integrity concerns and impacts associated with SST waste storage and removal operation could influence the selection of the preferred alternative.

4.5 FUTURE RETRIEVAL AND PROCESSING

The potential impact on future retrieval, transport, storage, and waste processing operations should be evaluated for each alternative. Actions that may potentially compromise, severely impact, or complicate these activities should be identified and described.

Existing and planned waste retrieval from the SSTs are principally designed to handle and transfer liquids. Waste retrieval involves sluicing or mixing present solids with liquids to permit the transfer of the liquid and slurry via pumps through existing and planned transfer lines to storage and process facilities. Installation of this equipment should not be restricted.

It is possible that contaminated soils associated with the SSTs may need to be removed or treated. The alternatives considered should be evaluated as to their potential to limit this activity.

4.6 SCHEDULE

Alternatives should be evaluated with respect to whether they could impact other TPA milestones and if the alternative can be constructed in a timely manner.

4.7 PROVEN TECHNOLOGY

The technical maturity of a process, system, or product can affect performance. The overall performance of a product could be a factor of the complexity of construction. The demonstration of operational readiness within established schedule constraints could be considered a function of technical maturity. Maturity can also be expressed in terms of the hierarchy, shown in Table 4-1.

Table 4-1. TECHNOLOGY MATURITY

PHASE	DESCRIPTION OF ACTIVITIES
Available	Technologies that are applied on a production scale in a conventional commercial industry.
Field Testing	Technologies that have been demonstrated on a pilot scale under similar circumstances.
Prototype	Technologies that have been demonstrated on a bench scale using simulated feed materials.
Under Development	Technologies that are supported by conceptual studies that are not backed by bench scale experiments.
Unavailable	Technologies that are not available for use.

In addition to the hierarchy, other factors that influence technical maturity or technology assurance include: (1) maximizing flexibility (adaptability for new technologies or mission change), (2) design flexibility or adaptability for incorporating improved technology, and (3) avoiding regulatory uncertainty.

4.8 MAINTAINABILITY

Evaluating the complexity, reliability, and reparability of the associated product and components can assess the maintainability of a system. Complexity is influenced by factors such as the level of training required to perform maintenance on the equipment, the need for special or unique tools or procedures, design qualities such as features that ease repair, standardized parts and provisions for troubleshooting. Reliability can be directly measured by failure rates/mean time to failure data, but it is also associated with frequency of test, calibration, and preventive maintenance procedures. Another key measure of reliability is the impact of failures on the process, including recovery or downtime following a failure. Reparability is a factor of several items, including work space, location of the equipment, methods to repair or replacement, personnel requirements, technical training, waste produced during repairs, and any functional test requirements. With regard to these aspects of maintainability, this analysis will highlight those characteristics that are significantly different between the alternatives.

4.9 OPERABILITY

Operability of a facility is a typical measure of the complexity of an item or system that may influence other aspects of operations, such as the following:

- Startup and Shutdown of the System. Most upset conditions can occur during startup or shutdown when the system is in an unsteady state condition. Identifying how the proposed alternative affects these tank farm activities is an important operability issue.
- Process Control. Will the proposed alternative effect normal operations, activities, or process control (samples equipment removal or replacement, etc.)?
- Troubleshooting and Response to Off-Normal Conditions. Will the proposed alternative affect the ability to troubleshoot or respond to an off-normal condition?

- Operator Interfaces. Will the alternative require significant operational interface or control?

4.10 CONSTRUCTIBILITY

Constructibility is a measure of difficulty and probability of satisfying all design/construction specifications within the physical, chemical, and radiological environment in which construction must occur.

4.11 DECONTAMINATION AND DECOMMISSIONING AND DISPOSAL

This criterion is a measure of the difficulty and probability of achieving successful decontamination and decommissioning (D&D) and disposal of decontaminated materials at the completion of the mission.

5.0 ALTERNATIVES CONSIDERED

Regardless of what alternative is selected, a variance must be obtained from WDOE.

The waiver process, as described in WAC 173-160-106 ("How do I apply for a variance on a water well?"), should place these wells in legal compliance with state law. According to WAC 173-160-106: "When strict compliance with the requirements of this chapter are impractical, any person may request a variance to the department from a regulation or regulations. The application for variance must propose a comparable alternative specification that will provide equal or greater human health and resource protection than the minimum standards. Application for a variance shall be made in writing and approved prior to the construction or decommissioning of the well.

The variance application shall contain at least the following information:

(a) Name, address, and phone number of the person requesting the variance;

(b) Address of well site;

(c) 1/4, 1/4, section, township, range;

(d) The specific regulation(s) that cannot be followed;

(e) The comparable alternative specification; and

(f) Justification for the request

The variance application will be evaluated, and response will be given within fourteen days."

This alternative includes seeking a short-term variance for Priority 1 and 2 wells and a long-term variance for the Priority 3 wells. Part of the justification for the variance includes the planned decommissioning of the Priority 1 and 2 wells in the near-term (62 Priority 1 and 60 Priority 2 wells). There are 712 Priority 3 wells that would not be decommissioned until after the tank farms are remediated.

The database contained in this report should be formally submitted to the state to provide a comprehensive database of SST farm wells. Negotiations with WDOE could propose that the following provides sufficient information for a variance for all SST farm wells:

- Watertight well plugs installed in 1999
- Recent spectral gamma logs
- Videos of a random sampling of the wells
- Controlled access to all tank farms
- Database in Appendix G

5.1 ALTERNATIVE 1: NO ACTION

Alternative 1 is not considered a viable option because it does not address the potential problem of the monitoring wells furthering the contamination of the vadose zone. State regulation WAC 171-303 requires facilities to institute corrective action as necessary to protect human health and the environment. Since the status quo does not provide a method to prevent or reduce infiltration of contaminants into the vadose zone and the groundwater, Alternative 1 will not be evaluated further.

5.2 ATERNATIVE 2: DECOMMISSION WELLS

According to WAC 173-160-460, "Resource protection wells that were not constructed in accordance with these regulations, or for which a drilling report required under this section is missing, shall be decommissioned in one of the following ways: (a) Perforate the casing from

the bottom to land surface and pressure grout the casing. (b) Withdraw the casing and fill the bore hole with cement grout, neat cement, or bentonite as the casing is being withdrawn."

Based on these requirements, three methods of well decommissioning will be evaluated: removal of the well casing, casing perforation, and a combination cut-remove-perforate method. There are two means of casing perforation; mechanical and jet shot, which provides total of four alternatives for decommissioning.

5.2.1 Alternative 2a: Remove Well Casing

Alternative 2a is not a simple operation and at times can be very difficult because it involves the use of a drilling rig, casing jacks, and includes attaching the jacks to the casing, pulling, and disposing of the casing. As the casing is being removed, the void is filled with cement grout.

5.2.2 Casing Perforation

Perforation is the second option for well decommissioning. One or a combination of two primary methods, mechanical or jet shot, can accomplish perforation. State regulations require four equidistant perforations per foot and each perforation shall be a minimum of 1.5 inch long. After perforation, the casing shall be pressure-filled with cement grout or equivalent. Enough pressure shall be applied to force the sealing material (grout) through the perforations, filling any voids on the outside of the casing.

5.2.3 Alternate 2b: Mechanical Perforation

Alternative 2b is accomplished by installing a perforator tool on the end of the drill rig pipe. The mechanical tool is lowered to the required depth and the teeth or cutting blades are extended to perforate the casing and the process is continued throughout the area requiring perforations. Mechanical perforation can be used on single casings only, and so cannot be used alone on double encased wells. For the decommissioning process, the total depth of the casing needs to be perforated. Following mechanical perforating, the well would be pressure grouted.

5.2.4 Alternative 2c: Jet Perforation

Alternative 2c is accomplished by shooting holes through the casing, the cement grout, and into the surrounding soil formation. Jet perforating was introduced to the oil fields shortly after World War II as an improvement over bullet perforating. Today, the majority of global perforating is performed by jet charges. The entire length or a portion of the casing can be perforated at one time. The top of the casing can be sealed so that the explosion is confined within the casing. The impact zone of influence for the jet shot can be controlled to within a couple feet of the well. Alternative 2c can be modified to provide sufficient charge to perforate the double well casing as identified in numerous wells within the SST farms.

5.2.5 Alternative 2d: Cut, Remove, and Perforate

Alternative 2d is a combination of the removal and mechanical perforating methods. Mechanical perforators are limited to perforating only a single casing. In numerous wells, a second inner casing was later installed and grouted inside the original outer casing. To accomplish perforation in those wells where a double casing exists requires the removal of the inner casing to facilitate mechanical perforation of the outer casing. The inner casing would be pulled similar to pulling the total well casing, the outer casing perforated, and then the well would be pressure-grouted to complete decommissioning.

5.3 ALTERNATIVE 3: WATERTIGHT MANHOLE

Alternative 3 provides for a watertight manhole (monument) over the existing well casing. State regulations require that the well should extend 6 in. above ground and have a locking watertight cap. The regulations also state that, "If the well is completed below land surface, a watertight cap with a lock shall be attached to the top of the well casing. A metal monument or equivalent shall be installed over and around the well. The monument shall serve as a protective cover and be installed level with the land surface and be equipped with a waterproof seal to prevent the inflow of any water or contaminants." Currently, most of the casings are at or near the ground surface except in TX, TY, and BX Tank Farms. In these farms, many of the casing heads are buried with plastic valve boxes providing access. Alternative 3 would install a watertight

manhole over all existing well casings. This modification would not affect the spectral gamma log baseline.

The watertight manhole applies to all variance wells and includes all wells around the tanks and other wells deemed necessary to monitor leaks and spills and to monitor contamination migration.

The watertight manhole alternative includes a watertight manhole, replacement of a 6-inch concrete pad, and well number identification (see Figure 5-1).

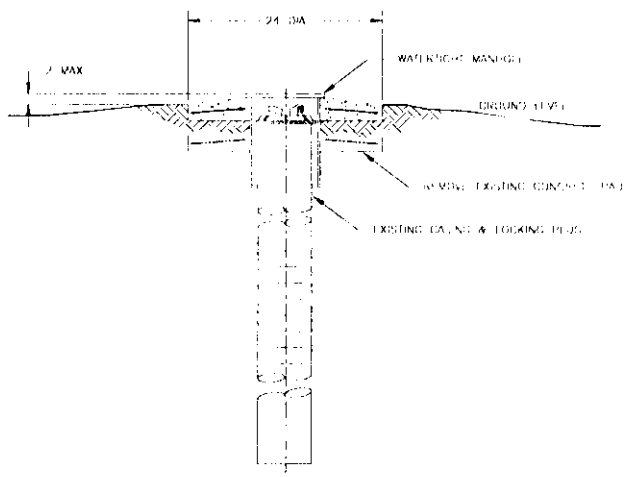

Figure 5-1. Watertight Manhole

6.0 EVALUATION OF ALTERNATIVES

6.1 DECISION MATRIX

A decision matrix combines the advantages, disadvantages, hazards and risks, and alternative costs (see Appendix D). The decision matrix takes a broad, comprehensive view of the alternatives and provides the basis for the preferred alternative.

Based on selected decision criteria, each alternative was evaluated in an effort to establish the most viable option. Each decision criterion was assigned a weight factor that reflects its relative importance to other decision criteria (see Table 6-1). Based on the decision criteria, each alternative was evaluated in an effort to establish the most viable option (see Appendix D).

Table 6-1

WEIGHT FACTOR

Importance	Weight Factor
Low	1
Low/Medium	2
Medium	3
Medium/High	4
High	5

Within each tank farm and for each alternative, a score factor has been given for each decision criterion. Numerical scores from 0 to 5 reflect the estimated impact on an alternative for each decision criterion (see Table 6-2).

Table 6-2

IMPACT FACTOR

Impact	Score
None	0
Light	1
Light/Moderate	2
Moderate	3
Moderate/Heavy	4
Heavy	5

The numerical scores for impact are interpreted as follows: Does the activity have little or no impact on the importance factor? If it has no impact or does not adversely affect the importance, the score is "0." A score of 5 (heavy) impact indicates that performing the alternative has a heavy impact on the importance item, or it will be detrimental to maintaining the importance item. For example: radiation exposure is assigned a weight factor of 5 for importance. If an activity will cause little or no exposure it may receive a "0" or "1," receiving a low multiplier score. However, if exposure were to be greatly increased as a result of the activity (less conservative mode) it may be a "4" or "5," thus receiving a high score (5 for radiation exposure multiplied by 4 for radiation exposure results in a "20" score).

Each alternative was rated on how it impacts each decision criterion. Numerical scores from 0 to 5 reflect the estimated impact of an alternative for each decision criterion. If an alternative has a high cost or could detrimentally or significantly impact safety, it would generate a higher number.

An impact score multiplied by the relative importance weight factor determines the alternative weighted score. This weighted score indicates how well the alternative performs. The higher the weighted score, the less favorable the alternative.

Appendix D contains the decision matrix for the tank farms.

6.2 ADVANTAGES AND DISADVANTAGES

Table 6-3 provides a comparison of advantages and disadvantages of the well assessment alternatives.

Table 6-3

WELL ASSESSMENT

Alternative/Cost	Advantages	Disadvantages
1. No Action	Annual operation and maintenance costs in current budget	Objectives of engineering study not achieved
Seek variance for wells	Facilitates compliance with state regulations	Survey of some wells may be required
	Cost dependent on negotiations	Negotiation with state required
		Data and justification submittal
2a. Remove Well Casing Estimated cost $7.5M*	Objectives of engineering study achieved	Very slow progress-as few as 50 ft per day
	Void is grout-filled as casing is removed	Must inject grout as casing is removed
	Eliminates hazard of infiltration via well casing	Maintain grout while removing casing
		Large volume of contaminated waste for disposal
		Casing may break or get stuck
2b. Mechanically Perforate Well Casing Estimated cost: $3.2M*	Widely used process	Impractical in wells with double or triple casing
	Objectives of engineering study achieved	Inconsistent perforations
	Large number of vendors	Requires grout injection
	No casing disposal	
2c. Jet Shot to Perforate Well Casing Estimated cost: $2.3M*	Objectives of engineering study achieved	Explosive charge to perforate well casing
	Commonly used process (90% of all perforations)	
	May be used in any well casing configuration or size	Concussion may affect waste tank on wells in close proximity (<2ft) to tank
	No casing disposal	
	Perforate any length casing and multiple casings at once	Requires grout injection
2d. Cut, Remove, and Perforate Estimated cost: $3.5M*	Applicable to multiple casings. Remove inner, perforate outer	Similar to remove casing and mechanical perforation
		Increased waste volume for disposal, including casing
	Objective of engineering study achieved	Potential spread of contamination
		Removal of inner casing and grout may be difficult and slow
3. Watertight Manhole Estimated cost: $4.3M (Priority 3 wells only)	Easy to locate each well	Variance still required
	Provides barrier to surface water migration into the casing	
	Maintain vehicle access	
	Partial compliance with state regulations	

This table is also shown in the Engineering report.

*Priority 1 wells only.

6.3 PRINCIPAL HAZARDS AND RISKS

The following hazards and risks associated with natural phenomena could affect the identified alternatives for decommissioning the wells.

6.3.1 Decommission Wells

6.3.1.1 Alternative 2a: Remove Well Casing

The primary hazards and risks identified with removing the well casing are primarily with those related to the construction period (casing removal). The hazards resulting from wind, earthquake, fire, equipment failure, or human error equate to the potential for the spread of radioactive and hazardous waste contamination. These events would normally be addressed by Hanford Site procedures.

6.3.1.2 Alternative 2b: Perforate Well Casing, Mechanically

The primary hazards and risks identified as a result of perforating and grouting the casing are minimal. The hazards resulting from wind, earthquake, fire, equipment failure, or human error are insignificant because all decommissioning activities are conducted below ground surface. The hazards and associated risks resulting from these events would normally be addressed by Hanford Site procedures and specific project provisions.

6.3.1.3 Alternative 2c: Perforate Well Casing, Jet Shot

The primary hazards and risks identified as a result of perforating and grouting the casing are minimal. The hazards resulting from wind, earthquake, fire, equipment failure, or human error are insignificant because all decommissioning activities are conducted below ground surface. The shot process has little potential for causing a potential risk or hazard to the tanks or surrounding equipment. The hazards and associated risks resulting from these events would normally be addressed by Hanford Site procedures and specific project provisions.

6.3.1.4 Alternative 2d: Cut, Remove, and Perforate

The primary hazards and risks identified as a result of cutting and removing the inner casing are primarily with construction activities (casing removal). The hazards resulting from wind, earthquake, fire, equipment failure, or human error equate to the potential for the spread of radioactive and hazardous waste contamination. The hazards and associated risks resulting from these events would normally be addressed by Hanford Site procedures and specific project provision.

6.3.2 Well Modifications For Continued Use

6.3.2.1 Alternative 3: Watertight Manhole

There are no recognized natural phenomena hazards or risks associated with this alternative.

6.4 COST AND SCHEDULE INFORMATION

Detailed cost estimates and schedules for the alternatives are tabulated in Appendix E. Costs are prepared for each SST farm priority and alternative considered. These costs are summarized in Tables II-E-1 through II-E-4. The schedule duration, based on estimated crew work shifts for each alternative and each tank farm, is shown on Tables II-E-5 through II-E-7 in Appendix E.

There are 13 wells that have been decommissioned and no future costs are projected. The wells identified as Priority 1 for decommissioning include groundwater wells and unidentified abandoned wells. The costs for these wells are separated by farm (Table II-E-1).

The wells identified as Priority 2 are outlying vadose zone wells greater than 50 ft from the outside of the tanks. Therefore, contamination migration monitoring potential respective to the tanks is questionable. There are approximately 7,000 ft of casing in these wells. Costs for wells for each farm are shown in Table II-E-2. The costs for the remaining vadose zone wells included in Priority 3 are tabulated by SST farm in Table II-E-3.

Revision 1 of this document revises the estimates to incorporate the most current site allocation factors and to reflect proposed changes in the method of work performance. During a detailed

planning effort for a portion of the Run-on Control effort, it was determined that the costs previously provided were not adequate to address executing the work as addressed by the Statement of Work. Dividing the proposed work into numerous contracts (addressing farms individually rather than performing work as a single project addressing multiple farms) increases the proportional costs of engineering, engineering during construction, construction management, survey, and site plan development.

Additionally, Revision 1 revises the text and Appendices II-B, II-C, and II-G, to add and delete wells based on the most current information, changing the total number of wells assessed from 838 to 847. However, the new totals were not incorporated into the estimate tables (Tables II-E-1 through II-E-7), and this accounts for some discrepancies when comparing the text and listings to the estimate tables. The impact to the total rough order of magnitude cost accounts for less than 1% of the total costs shown, and so does not significantly impact the total costs.

7.0 IDENTIFICATION OF PREFERRED ALTERNATIVE

7.1 PREFERRED ALTERNATIVE

The first action to be taken is to request a variance for all Priority 1, 2, and 3 wells. This action will satisfy the needs and requirements of the State (WDOE). Requesting a variance may require that limited field work be completed since this is primarily a data submission and negotiation process. It can be completed cost effectively. This process notifies the State of the plan for bringing the wells into compliance with WAC-173-160. Requesting a variance should be done prior to any further decommissioning activities. This process should include negotiations with the State. Due to the indeterminate condition of the perforations in a portion of the wells, a visual inspection may be required. This will determine if the perforations are corroded shut and suitability of Priority 3 wells for PITT.

The current configuration of the wells, due to existing conditions such as inappropriate sealing around the top portion of the casings, lack of a seal at the bottom of the casing, presence of perforations, or a combination of these attributes, may provide a preferential pathway for contaminant migration to the groundwater. Sequential decommissioning of all wells within the tank farm boundaries provides a strategy that will provide for future operational needs of the

SST farms. A recommended sequencing, based on priority has been developed, that considers all well types. These priorities represent the urgency for a specific well type to be decommissioned. The primary factor considered in developing the priorities is the ease of direct access to the groundwater provided by the wells. Groundwater wells extending to the groundwater present the highest risk associated with contaminant transport. The first groundwater wells to be decommissioned should be those in the farms with the highest contamination levels.

The scope of the decommissioning effort involves 847 wells that have been reviewed by type and divided by priority. Thirteen wells previously decommissioned in accordance with WAC 173-160 require no further action. Priority 1 includes 62 wells that extend to the groundwater and that have been abandoned or are located adjacent to the cribs. Priority 2 consists of 60 outlying vadose zone wells that are located at the peripheral of the tank farms and are not suitably located for use in the monitoring efforts during tank retrieval. Priority 3 includes the remaining 712 vadose zone wells that are recommended for decommissioning after retrieval. Priority 3 vadose zone wells may be used for monitoring during tank retrieval.

Sequential decommissioning includes three primary phases. The first phase includes the decommissioning of the wells contained in Priority 1. The second phase will decommission the wells in Priority 2. The preferred decommissioning method for the wells in Priority 1 and 2 is Alternative 2c, jet shot perforation and grouting (refer to Section 5.2.4). Current technology makes the jet shot method the safest, fastest, and most cost-effective method.

The third phase includes decommissioning the remaining vadose zone wells following waste retrieval from the SSTs. The preferred alternative for decommissioning Priority 3 wells is also Alternative 2c, jet shot perforation and grouting.

7.2 UNCERTAINTIES

The primary uncertainties identified include the indeterminate condition of the well configurations and the existing condition of the casings. The decommissioning effort may be significantly impacted by variations in these attributes. Visual inspection, using TV cameras and

monitors, will be required prior to performing any decommissioning efforts to ensure that the decommissioning performed is in compliance with Washington State regulations.

8.0 REQUIRED MEASURES TO IMPLEMENT PREFERRED ALTERNATIVE

Measures associated with implementing the sequential decommissioning and the preferred alternative include the following steps:

Step 1	Request a variance by WDOE for all Priority 1, 2, and 3 wells prior to decommissioning any wells.
Step 2	Visually inspect all groundwater wells and vadose zone wells not previously visually inspected.
Step 3	Obtain special use permit for using jet shot perforation.
Step 4	Train the jet shot perforator fixed-price contractor to Hanford Site requirements.
Step 5	Prepare job safety analysis.

9.0 WELL DESCRIPTIONS

9.1 WELL TYPES

There are two distinct types of wells: groundwater wells extend into the groundwater, and vadose zone wells extend into the ground to various depths but do not extend into the groundwater. The construction details for wells have evolved over a 40-year period.

There are 15 configurations for the tank farm wells. These configurations vary in casing size, the combination of different sized casings, double casings, surface grouting, perforations, etc. The configuration and description of each well type are included in Appendix A.

9.2 FITNESS FOR USE AND DECOMMISSIONING PRIORITY

9.2.1 Fitness for Use

A fitness-for-use evaluation was performed on all wells within the scope of this study. All the wells listed in Appendix G are currently noncompliant with the regulatory requirements, except for the decommissioned wells and well 299-E33-41 (Washington State #A4867). Well 299-E33-41 is a RCRA well currently in use for groundwater

monitoring (Hartman 1998) located outside the 241-BX SST farm fence. The fitness-for-use (or fitness-for-intended-use) evaluation first looked at current uses of the wells in the SST farms and if the wells were fit for these uses. Two possibilities were identified: monitoring of the groundwater and monitoring of the vadose zone.

Groundwater monitoring is currently performed by a program independent of the SST farms. Wells identified for this monitoring program are all outside the SST farm boundaries. Therefore, any groundwater wells within the farms are no longer needed or required, and no longer fit-for-use.

The wells were evaluated for fitness for use in monitoring of the vadose zone. Monitoring possibilities includes tank leaks and contamination migration during interim operations, waste retrieval, and tank decontamination and decommissioning. Most of the vadose zone wells are considered fit for the intended use of monitoring contamination of the vadose zone.

According to Mr. Stan Leja, WDOE, many of the wells can be considered fit-for-the-intended-use, however a variance would be required to allow use of the selected wells. The variance provides documentation of the current status of the vadose zone wells and is filed with the state regulatory agency, WDOE. Vadose zone wells considered fit for the intended use would require visual inspection.

Location and risk to the vadose zone and groundwater were also considerations used to evaluate the vadose zone wells. Vadose zone wells in low-lying areas, where water or waste would migrate from a spill, are considered a higher risk to the groundwater. Vadose zone wells in these areas could provide a shorter preferential path for contamination to the groundwater and therefore are considered unfit for use. Wells greater than 15 m (50 ft) away from the tanks were considered to have a reduced potential for providing leak or contamination monitoring during interim operation and waste retrieval and therefore are considered unfit for intended use.

Ultimately, all the wells in the scope of the study will require decommissioning. The wells identified as fit-for-the-intended-use will be decommissioned after retrieval or when the specified use is completed.

9.2.2 Decommissioning Priority

Considering the many variations in the configurations and conditions, various classification of wells have been developed to better define the current status and establish the necessary future actions. These types provide a means of combining similar methods of construction, concurrently with a prioritization of the wells for decommissioning.

9.2.2.1 Wells Currently Decommissioned, No Action Required

Thirteen wells have been decommissioned in accordance with WAC 173-160, *Minimum Standards for Construction and Maintenance of Wells.* No action is required on these wells. A listing of these wells by farm is included in Appendix B.

9.2.2.2 Priority 1 Wells for Decommissioning

Groundwater wells within the tank farm boundaries, type B1. Also included are wells of unknown conditions, type H. These unknown wells, in immediate proximity to the tanks, have been drilled, capped approximately 1-ft below the ground surface, and buried.

Some additional Priority 1 wells are within the T-Tank Farm boundary and around cribs 216-T-7 and 216-T-32. These wells, types D and F1, have been identified because they are down gradient from the tanks and any surface spills would tend to flow in their direction and have a direct path to the vadose zone and groundwater. A listing of Priority 1 wells by farm is included in Appendix B. There are 62 Priority 1 wells.

9.2.2.3 Priority 2 Wells for Decommissioning

Outlying vadose zone wells located outside the immediate proximity of the tank, usually more than 15 m (50 ft) from a tank. A listing of Priority 2 wells by farm is included in Appendix B. There are 60 Priority 2 wells.

9.2.2.4 Priority 3 Wells for Decommissioning, After Retrieval

Vadose zone wells located around the tanks. These wells have the potential of monitoring the vadose zone during waste retrieval and tank decommissioning and would be decommissioned after these activities. A listing of Priority 3 wells by farm is included in Appendix B. There are 712 Priority 3 wells.

9.3 WELL MODIFICATIONS FOR CONTINUED USE

Well modifications to achieve compliance with WAC-173-160 would present a wide number of alternatives, but achieving total compliance is not deemed practical unless a variance is obtained from the State.

Well installation on the SST farms began with the initial construction of the B, C, T, and U Tank Farms in the early 1940s and continued through the present. The majority of the monitoring wells were installed in the late 1960s and through the 1970s. The state regulations were not adopted until 1973, and it was several years later before the Hanford Site adopted the state regulations. The majority, if not all, of the wells are noncompliant with today's regulations. Starting in 1976, a modification to the wells (sometimes referred to as the Webster Completion) was installed. This modification included a 2-in. grout surface seal and a grout plug at the bottom of the well. This modification is assumed to be a result of an effort to meet state regulations at that time.

Spectral gamma-ray logging has been done on a majority of the monitoring wells associated with the SST farms, but not where access was impossible. This logging has established a baseline for future monitoring of the SSTs during the interim stabilization phase and the future retrieval of the waste. Any modification to the wells that changes the casing or adds grout in or around the casing would affect the established spectral gamma baseline. Therefore, modifying the well structure to meet current regulations is counterproductive for Priority 3 wells.

10.0 SPECIAL CONSIDERATIONS

Assessments were performed to determine if the wells defined as unfit-for-use may be used for sampling the vadose zone soils during decommissioning or for possible use in the cross-borehole PITT. Based on the results of these assessments, the wells considered fit-for-use for either application have been identified as the Priority 3 wells and are listed in Appendix C. Further details regarding the assessment processes, existing conditions, and the final results are provided in the following sections.

10.1 VADOSE ZONE SOIL SAMPLING

The assessment for the vadose zone soil-sampling was completed through a review of the gamma logs for the Priority 3 wells. These wells were selected based on the locations inside the farm boundaries and proximity to the tanks. The review process consisted of identifying locations in the wells that exhibit high levels of contamination, represented as spikes in the gamma logs. The extent of the contamination varies throughout the depth of the well and from well to well. The logs however, provide sufficient data to identify and approximate depths for the most concentrated zones (as presented in Appendix C under the heading, "Soil Sample"). The number of locations and range of depths vary significantly but are shown at several locations to capture the more extreme cases. The locations shown may be screened further and the number of samples to be obtained can vary to accommodate the extent of the detail necessary.

Investigation regarding the soil sampling process revealed that there are no practical and currently available ways to take soil samples while removing the casing.

10.2 PARTITIONING INTER-WELL TRACER TESTING (PITT)

An assessment was performed to determine the possible use of the wells for PITT. This assessment consisted of a review of the well listing (shown in Appendix G) and the location sketches in Appendix H to identify those wells that are appropriately located and satisfy the basic parameters to perform the tests. The test parameters are available and based on information provided in a referenced letter (Jackson 1998). This letter describes the PITT performed at the Sandia National Laboratories in New Mexico and provides general guidance for the selection process. The results of the assessment revealed that the wells in Priority 3 are located in a

configuration acceptable to perform PITT and are the recommended candidates for use in the tests. The indeterminate condition of the perforations in a portion of the wells would require a visual inspection of the entire depth of the well, prior to use in tests, since the perforations probably are corroded to the point of being closed. Since perforation of the well casing would be required for all wells, as an integral step in the decommissioning process, the PITT should be performed in conjunction with the schedule for the well decommissioning. Based on these conditions, all wells identified in Priority 3, Appendix C, are acceptable for use in the PITT.

Spectral gamma logs were reviewed for indication of contamination in the soil outside of the well casing. In the matrix in Appendix C, under the heading, Soil Sample, a range is given (in feet) where spikes were observed in the logs. In general, an indication of any peak above 10° picocurie/gram (1 pci/g) is listed. The approximate range(s) of the indication is listed as a depth range in the well casing, such as 0-15 ft. The specific type of waste was not defined since any peak above 1 pci/g was the criterion used to be added on the list.

11.0 REFERENCES

11.1 DOCUMENTS

Armstrong, W. C. *Specifications for Radiation Monitoring Wells, Leak Detection – High Level Waste Tanks 241-A and 241-SX*, HW-8158, General Electric Company, Richland, Washington 99352, June 1961.

Barnett, D. B., J. D. Davis, H. Hampt, J. W. Lindberg, K. F. Donnelson. *Hanford Tanks Initiative Work Plan – Subsurface Characterization to Support the Closure-Readiness Demonstration for Tank 241-AX-104*, WHC-SD-WM-WP-337 Rev. 0, Westinghouse Hanford Company, Richland, Washington 99352, September 1996.

Gardner, M. G. *Summary Report of Hanford Site Well Remediation and Decommissioning Activities Through Fiscal Year 1993*, WHC-SD-EN-PRS-001, Westinghouse Hanford Company, Richland, Washington 99352, December 1993.

Gardner, M. G., A. L. Schatz. *Summary Report of Hanford Site Well Remediation and Decommissioning Activities Through Fiscal Year 1995*, WHC-SD-EN-PRS-003, Westinghouse Hanford Company, Richland, Washington 99352, December 1995.

Gee, G. W., M. J. Fayer, M. L. Rockhold, and M. D. Campbell. *Variations in Recharge at the Hanford Site*, Northwest Science, Vol. 66, No 4, 1992.

Gee, G. W, P. J. Wierenga, B. J. Andraski, M. H. Young, M. J. Fayer, and M. L. Rockhold. *Variations in Water Balance and Recharge Potential at Three Western Desert Sites*, Soil Science Society of America Journal, Volume 58, No. 1, January-February 1994.

Gee, G. W., A. L. Ward, and R. R. Kirkham. *Long-Term Stewardship Workshop*, Conference Proceedings 980652, U. S. Department of Energy, Grand Junction Colorado, June 2-3, 1998.

General Electric Company. *Specification for PUREX 241-AX Tank Farm (Division XI, Test Well) Rev. 2*, HWS-8237, Richland, Washington 99352, May 1963.

Gephart, R. E. and P. A. Eddy. *Groundwater Monitoring Program for the 200 East and 200 West Areas*, ARH-CD-293, Atlantic Richfield Hanford Company, Richland, Washington 99352, December 1976.

Hartman, M. J. *Hanford Site Groundwater Monitoring for the Fiscal Year 1998*, PNNL-12086, Pacific Northwest National Laboratory, Richland, Washington 99352, February 1999.

Kos, S. E. *Assessment of Vadose Zone Radionuclide Contamination Around Single Shell Tank 241-C-103*, WHC-SD-EN-TI-299 Rev. 0, Westinghouse Hanford Company, Richland, Washington 99352, December 1995.

Ledgerwood, R. K. *Summaries of Well Construction Data and Field Observations for Existing 200-East Resource Protection Wells*, WHC-SD-ER-TI-007 Rev. 0, Westinghouse Hanford Company, Richland, Washington 99352, September 1993.

Ledgerwood, R. K. and D. J. Moak. *Fitness-For-Intended Use Evaluation Recommendations for Hanford Site 600 Area Wells Rev. 0*, WHC-SD-EN-AP-161, Westinghouse Hanford Company, Richland, Washington 99352, January 1994. Including related engineering change notices: ECN-614122, -614124, -186390, -186391, -611433, -611437, -611443, -611438, -611435, -611441, -607450, -708153.

Piepho, M. G., J. D. Davis, K. A. Lindsey, M. D. Ankeny, M. A. Prieksat. *Sensitivity Analysis of Sluicing-Leak Parameters for the 241-AX Tank Farm*, WHC-SD-WM-ANAL-052 Rev. 0, Daniel B. Stevens & Associates Inc. and SGN Eurisys Services Corp., Richland, Washington 99352, December 1996.

Price, R. K. and J. P. Kiesler. Spectral Gamma-Ray Log Report for Tank 241-T-101 Borehole Surveys, WHC-SD-EN-TI-163 Rev. 0, Westinghouse Hanford Company, Richland, Washington 99352, June 1993.

Schatz, A. L. and D. J. Underwood. *Hanford Well Custodians,* WHC-SD-EN-DP-071 Rev. 1, Westinghouse Hanford Company, Richland, Washington 99352, February 1995. Including related engineering change notice: ECN-617505.

Stokes, W. J. and R. P. Marshall. *Single Shell Tank Retrieval Program Mission Analysis Report Rev. 0,* HNF-2944, Lockheed Martin Hanford Corporation, Richland, Washington 99352, August 1998.

Techcon. *Forum on Reducing Water Infiltration Around Hanford Tanks*, Volume 1 and 2, May 4-6, 1999.

Tyler, S. W., B. R. Scanlon, G. W. Gee, G. B. Allison. *Water and Solute Transport in Arid Vadose Zones*, Vadose Zone Hydrology, Cutting Across Disciplines, Oxford University Press, pp. 334-373, 1999.

U.S. Department of Energy. *Hanford Tank Farms Vadose Zone, S Tank Farm Report,* GJO-97-13-TAR or GJO-HAN-11, Grand Junction Colorado. For a complete list of single-shell tank farm vadose zone reports see Appendix F.

Vladimiroff, D. T. *Single-Shell Tank Interim Stabilization Project Plan,* HNF-2358 Rev. 3, Fluor Daniel Northwest Inc., Richland, Washington 99352, January 1999. Including related engineering change notice: ECN-634819.

Washington State Department of Ecology. *Dangerous Waste Regulations,* Ch. 173-303 WAC, Publication 92-91, Kennewick, Washington 99336, February 1998.

Washington State Department of Ecology. *Minimum Standards for Construction and Maintenance of Wells*, Ch. 173-160 WAC, Kennewick, Washington 99336, April 1998.

Washington State Department of Ecology. *Rules and Regulations Governing the Regulation and Licensing of Well Contractors and Operators,* Ch. 173-162 WAC, Kennewick, Washington 99336, April 1998.

Washington State Department of Ecology. *Water Well Construction Act,* Ch. 18.104 RCW, Kennewick, Washington 99336, April 1998.

11.1.1 Hanford Wells Reports

Brown, D. J., R. G. Ibatuan. *Hanford Wells,* HW-44355 Rev. 1, General Electric Company, Richland Washington, April 1958.

Brown, D. J., V. L. McGhan. *Hanford Wells,* HW-44355 Rev. 2, General Electric Company, Richland Washington, January 1963.

Chammess, M. A., J. K. Merz. *Hanford Wells,* PNL-8800, Pacific Northwest Laboratory, Richland Washington, August 1993.

Essig, T. H. and F. B. Steele. *Hanford Wells,* BNWL-928, Pacific Northwest Laboratory, Richland Washington, October 1968.

Honstead, J. F., R. E. Brown, D. J. Brown. *Hanford Wells,* HW-44355 Rev. 0, General Electric Company, Richland Washington, July 1956.

Kipp, K. L., V. L. McGhan, D. W. Damschen. *Hanford Wells,* BNWL-1793, Battelle Pacific Northwest Laboratory, Richland Washington, June 1973.

McGhan, V. L. *Hanford Wells,* PNL-6907, Pacific Northwest Laboratory, Richland Washington, June 1989.

McGhan, V. L., P. J. Mitchell, R. S. Argo. *Hanford Wells,* PNL-5397, Pacific Northwest Laboratory, Richland Washington, February 1985.

McGhan, V. L., D. W. Damschen. *Hanford Wells,* BNWL-2894, Pacific Northwest Laboratory, Richland Washington, May 1979.

McGhan, V. L., D. W. Damschen. *Hanford Wells,* BNWL-2296, Battelle Pacific Northwest Laboratory, Richland Washington, June 1977.

McGhan, V. L., D. A. Myers, D. W. Damschen. *Hanford Wells,* BNWL-1981, Battelle Pacific Northwest Laboratory, Richland Washington, March 1976.

11.2 CORRESPONDENCE

Gardner, M. G. to S. Leja. January 31, 1997, *State of Washington Well Decommissioning Report*, RFSNW-9050916, Rust Federal Services of Hanford Inc., Richland, Washington 99352.

Geosciences Function to R. K. Welty. April 29, 1993, *Spectral Gamma-Ray Log Report of Radionuclide Surveys Acquired for Single Shell Tanks 105-C and 106-C*, 81230-93-018, Westinghouse Hanford Company, Richland, Washington 99352.

Jackson, R. E. to D. Myers. December 1, 1998, *Partitioning Interwell Tracer Test for Leak Detection*, Duke Engineering and Services, Austin, Texas 78758.

Well Services to G. J. Coleman. April 29, 1996, *Status of TY Farm Well Decommissioning*, 8H400-96-004, Westinghouse Hanford Company, Richland, Washington 99352.

Wicks, J. H. to A. B. Sidpara. January 12, 1996, *Overall Management Strategy for Perforated Borehole Issue*, 9650188, Westinghouse Hanford Company, Richland, Washington 99352.

Willis, N. P. to J. L. Deichman. May 25, 1977, *Radiation in AX Leak Detection Pits*, Atlantic Richfield Hanford Company, Richland, Washington 99352.

11.3 DRAWINGS AND SKETCHES

BNWL-1981, Sh. 1, Hanford Well Location Maps.

BNWL-2296, Sh. 1, Hanford Well Location Maps.

ES-E051301-C3, Sh. 2, Rev. 0, Test Wells 241-B 1943-1945.

ES-E50857-C1, Sh. 1, Rev. 0, Partial Plan 241-SX Tank Farm Wells & Leak Detection Systems.

ES-E55209-C1, Sh. 1, Rev. 0, S-Farms Complex Test Wells, Cribs & Upr's.

ES-E55209-C2, Sh. 1, Rev. 0, 241-S Tank Farm Wells & Misc Spill Location.

ES-E55209-C2, Sh. 2, Rev. 0, 241-SX Tank Farm Wells & Misc. Spill Location.

H-2-637, Sh. 1, Rev. 3, Test Wells Layout & Details 241-BX.

H-2-1116, Sh. 1, Rev. 4, Well Locations 241-B-BX-BY Areas.

H-2-1123, Sh. 1, Rev. 1, Well Locations (Formerly called 361-B) & 241-C Areas.

H-2-1124, Sh. 1, Rev. 0, Well Locations 241-T-TX & 361 Areas.

H-2-1130, Sh. 1, Rev. 0, Well Locations 234-5 & 241-U Areas.

H-2-1697, Sh. 1, Rev. 1, Well Locations 231-Z Areas.

H-2-1777, Sh. 1, Rev. 1, Test Well Details.

H-2-31880, Sh. 1, Rev. 2, 241-A Tank Farm Leak Detection System.

H-2-31881, Sh. 1, Rev. 2, 241-SX Tank Farm Leak Detection System.

H-2-31882, Sh. 1, Rev. 2, 241-A & 241-SX Tank Farms Leak Detection Systems.

H-2-31882, Sh. 2, Rev. 2, 241-A & 241-SX Tank Farms Leak Detection Systems Instrument Building.

H-2-33088, Sh. 1, Rev. 0, 241-SX-105 Tank Modifications.

H-2-35956, Sh. 1, Rev. 1, Partial Plot Plan 241-BX Tank Farm Piping Location.

H-2-36862, Sh. 1, Rev. 0, Lithology of Dry Wells 241-TY-Tank Farm.

H-2-36862, Sh. 2, Rev. 0, Lithology of Dry Wells 241-TY-Tank Farm.

H-2-36933, Sh. 1, Rev. 4, Well Information As-Built 200E Area.

H-2-36933, Sh. 2, Rev. 10, Well Information As-Built 200E Area.

H-2-36935, Sh. 1, Rev. 4, Wells in 241-AX Farm As Built.

H-2-36938, Sh. 1, Rev. 6, Wells in 241-B Farm As Built.

H-2-36939, Sh. 1, Rev. 5, Wells in 241-BX Farm As Built.

H-2-36940, Sh. 1, Rev. 6, Wells in 241-BY Farm As Built.

H-2-36941, Sh. 1, Rev. 5, Wells in 241-C Farm As Built.

H-2-36942, Sh. 1, Rev. 11, Well Information As-Built 200W Area.

H-2-36942, Sh. 2, Rev. 10, Well Information As-Built 200W Area.

H-2-36943, Sh. 1, Rev. 5, Wells in 241-S Farm As Built.

H-2-36944, Sh. 1, Rev. 2, Wells in 241-SX Farm As-Built.

H-2-36945, Sh. 1, Rev. 7, Wells in 241-T Farm As Built.

H-2-36946, Sh. 1, Rev. 5, Wells in 241-TX Farm As Built.

H-2-36947, Sh. 1, Rev. 3, Wells in 241-TY Farm As-Built.

H-2-36948, Sh. 1, Rev. 7, Wells in 241-U Farm As Built.

H-2-38091, Sh. 1, Rev. 0, Well Closure & Lock Assembly.

H-2-44501, Sh. 1-165, Area Maps 200 East.

H-2-44511, Sh. 1-186, Area Maps 200 West.

H-2-57976, Sh. 1, Rev. 2, 241-A & 241-SX Tank Farm Leak Detection System Instrument Building Arrgt. & Drawing List.

H-2-57977, Sh. 1, Rev. 1, 241-A & 241-SX Tank Farm Leak Detection System Horizontal Carrier Tube Installation.

H-2-57978, Sh. 1, Rev. 1, 241-A & 241-SX Tank Farm Leak Detection System Loading Head Assy & Details.

H-2-57979, Sh. 1, Rev. 1, 241-A & 241-SX Tank Farm Leak Detection System Carrier Tube End Section-Details.

H-2-70063, Sh. 1, Rev. 1, Dry Well Liner Installation Details In-Place Monitor Prototype.

H-2-70082, Sh. 1, Rev. 2, High Level GM Probe Dry Well Monitor (Red Probe).

H-2-70083, Sh. 1, Rev. 1, Vertical Dry Well Monitor System Description.

H-2-70188, Sh. 1, Rev. 2, Gross Counting Scintillation Probe Assembly.

H-2-71825, Sh. 1, Rev. 1, Leak Detection System - Test Well & Riser Connection Details.

H-2-71825, Sh. 2, Rev. 4, Leak Detection System - Plot Plan & Trench Locations.

H-2-71825, Sh. 3, Rev. 4, Leak Detection System - Equipment Enclosure Installation.

H-2-72208, Sh. 1, Rev. 0, Dry Well & Detector Installation Details In-Place Gamma Monitor.

M-2600-E, Sh. 1-33, Topographic Map 200 East Area.

M-2600-W, Sh. 1-23, Topographic Map 200 West Area.

11.4 CONTACTS

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APPENDIX A

WELL DESCRIPTIONS

1.0 WELL TYPES

The well assessment effort requires a thorough understanding of the various conditions and configurations associated with the existing wells located in and adjacent to the tank farms. During the initial phase of the investigation, two distinct types of wells were identified. These types, consists of "groundwater wells," which extend into the groundwater and "vadose zone wells," which extend into the ground to various depths, however do not extent into the groundwater. The construction details for the tank farm wells have evolved over approximately 40 years in which the wells were installed. Table 1 shows the distribution of wells installed in the various tank farms during that time period.

Table 1

DISTRIBUTION OF WELL INSTALLATIONS OVER TIME

YEAR	CONSTRUCTION IN FARMS	YEAR	CONSTRUCTION IN FARMS	YEAR	CONSTRUCTION IN FARMS
1944	B, C, T, U	1960		1976	A, B, S, TX, U
1945	C	1961		1977	C, T, TX, TY, U
1946		1962	A, SX	1978	A, AX, C, S, SX, T, TX
1947	BX, T	1963		1979	T
1948	BX, T	1964	A	1980	
1949	TX, BY	1965		1981	T
1950		1966	A	1982	A, C
1951	T	1967	BX, BY	1983	BY, C
1952	A, S, TY	1968		1984	A
1953		1969	A, SX		Various wells have
1954	SX	1970	B, BX, BY, C, S, SX, TX		been installed through
1955	A	1971	B, BX, BY, S, SX, TX, TY		the present day.
1956	SX	1972	B, BX, BY, C, SX		
1957		1973	B, BX, BY, S, SX, T, TX, TY, U		
1958	SX	1974	AX, B, BY, C, S, SX, T, TX, TY, U		
1959		1975	AX, C, T, U		

The significant number of variations in the well configurations is extensive enough that further description of each type is necessary to establish the appropriate alternatives and costs for remedial action. The following sections describe the various well configurations identified, including the abandoned and decommissioned wells.

1.1 Groundwater Wells

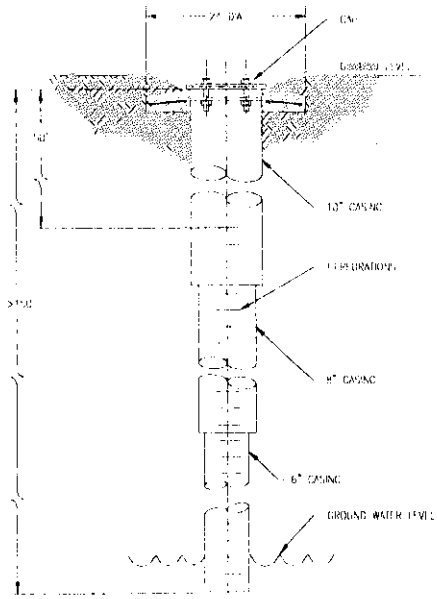
The well configurations encountered during the study consist of both single and multiple-diameter casings installed to various depths. The well diameters range from 6 in. to 12 in. and the depths from approximately 150 ft to over 300 ft. The well construction details used varied over time and to a lesser extent from farm to farm. However, the following three general features were identified through the course of the study:

- A grout seal is provided at the outside perimeter of the primary casing, extending from the ground surface to approximately 50 ft below grade. A similar grouting detail at the top of the well consists of a 4-in. diameter casing installed inside the primary casing. In this detail, the 4-in.casing may extend to the bottom of the well, the primary casing is perforated, and the annulus between the 4-in. casing and the primary well casing is grouted.

- Sections of the well casing are perforated and the entire casing is grouted from various elevations to the bottom of the well. In some situations, the available details are insufficient to determine the extent to which the well is grouted.

- Provision for a grout seal or plug, which is installed to varying depths and extends to the bottom of the well.

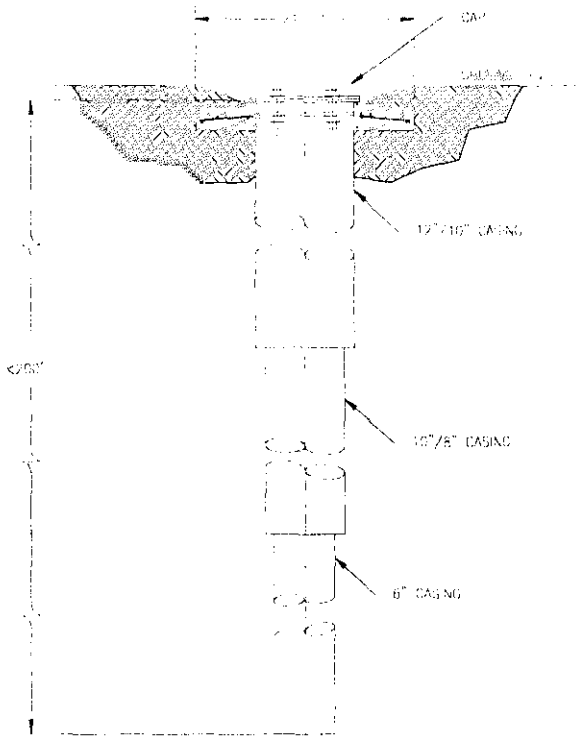
1.1.1 TYPE "A" Well – A Type A well consists of from two to four casings, ranging from 10-in. diameter at ground level to 6-in. diameter at the bottom of the well. This well type is perforated from a depth of approximately 50 ft and extends to the bottom of the well. The distinguishing features of this well type are the several casing sizes and the perforations provided in the casings to the depth of the well (see figure 1).



TYPE A GROUND WATER WELL

Figure 1

.2 **TYPE "A1" Well** - A Type A1 well consists of from two to three casings, ranging from 10-in. diameter at ground level to 6-in. diameter at the bottom of the well. The well casing is not perforated and, based on available information, may not extend to the groundwater. Type A1 wells varying depth to 200 ft. Since the information regarding the groundwater depth is insufficient, a separate well type is provided (see figure 2).



TYPE A1 VADOSE ZONE WELL

Figure 2

1.1.3 TYPE "B" Well – A Type B well consists of a single, 6-in. diameter casing with depths varying from 150 ft to approximately 200 ft. This well type is grouted around the outside of the casing and extends from ground level to a maximum depth of approximately 20 ft. A grout plug exists at the bottom of the well and the casing is perforated from ground level to the bottom of the well. Due to the limited information available, these wells may or may not extend to the groundwater (see figure 3).

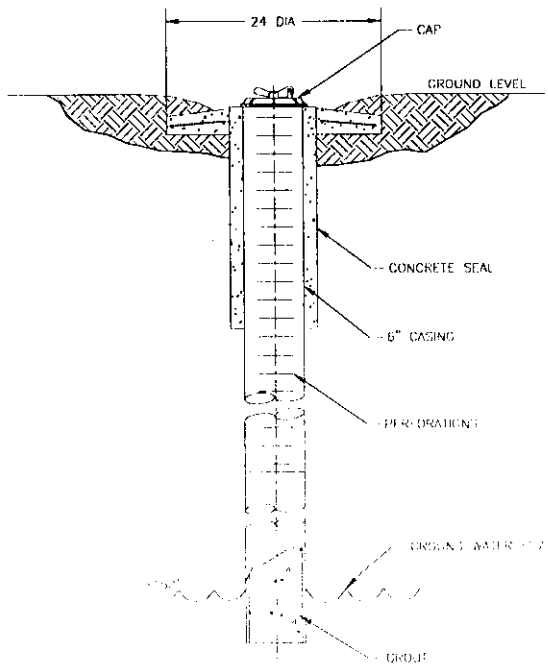


Figure 3

.4 **TYPE "B1" Well** –A Type B1 well consists of a single, 6-in. or 8-in. diameter casing which extends to depths varying from 150 ft to approximately 200 ft. This well type is grouted at the top of the well from ground level, varying in depth to a maximum of approximately 20 ft. The grouted portion of the well consists of a perforated, 4-in. casing with a welded cap plate at the bottom, located inside the existing casing with the annulus between the casings grouted. A grout plug of varying lengths exists at the bottom portion of the well. This well type has perforations through the 6-in. or 8-in. casing, extending from ground level to the bottom of the well. Based on the limited information available, these wells may or may not extend to the groundwater (see figure 4).

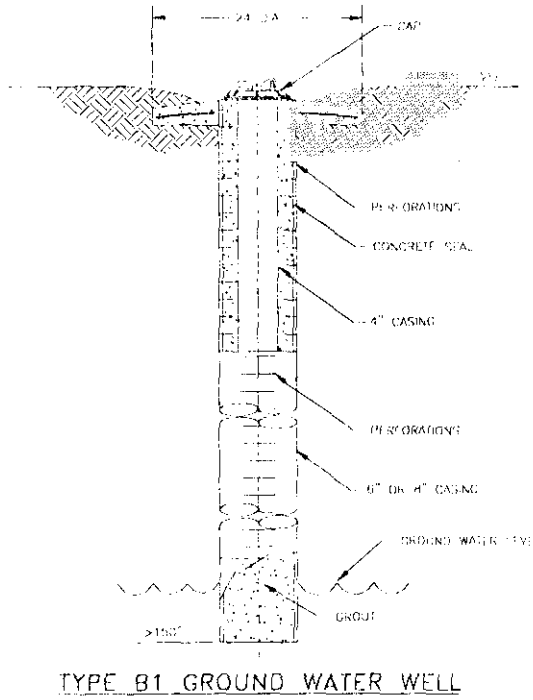


Figure 4

.2 **Vadose Zone Wells** – The vadose zone well configurations identified during the investigation exhibit a generally, uniform configuration throughout the tank farms. The

diameter of a majority of the wells are 6-in.and 8-in. with a depth ranging from 75 ft to 150 ft. The wells are predominately of one diameter, throughout the entire length. The general well construction consists of the casing with a grout seal around the outside of the casing, which extends from ground level a depth in the range of approximately 20 to 50 ft. A seal plug is provided in the bottom of the casing. A general description of each type of well construction is provided in the following paragraphs.

1.2.1 TYPE "C" Well – A Type C well consists of a 10-in. diameter casing within a 12-in. casing. The 12-in. casing extends from ground level to a depth of approximately 50 ft. The 10-in. casing extends from ground level with various depths to a maximum depth of approximately 150 ft. The 10-in. casing is perforated from 50 ft below ground level to the bottom of the well. Based on available information, no grout seal exists at the bottom of the well (see figure 5).

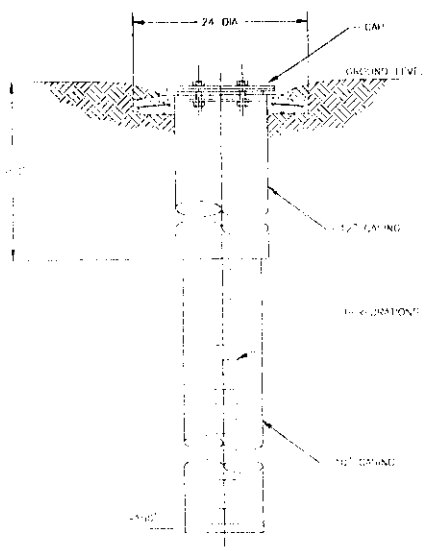
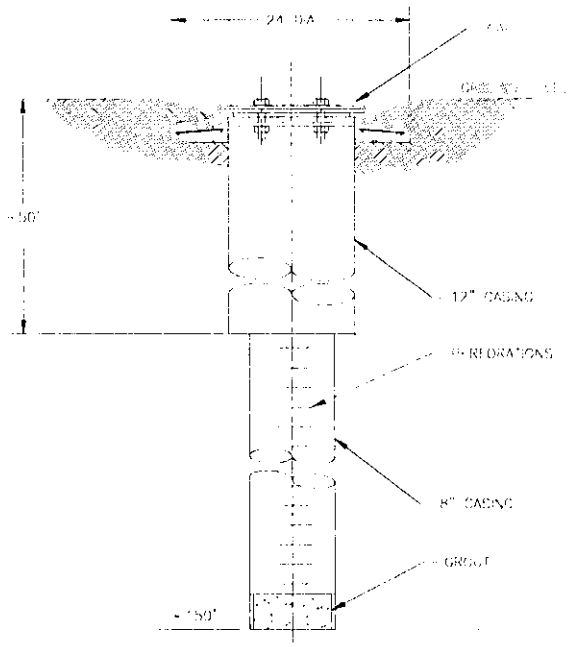


Figure 5

1.2.2 TYPE "C1" Well – A Type C1 well consists of an 8-in. diameter casing inside a 12-in. casing. The 12-in. casing extends from ground level to a maximum depth of approximately 50 ft. The 8-in. casing extends from ground level with various depths with

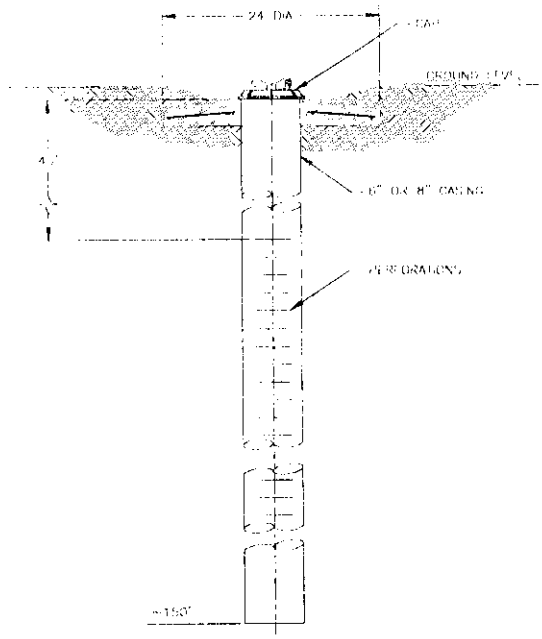
a maximum depth of approximately 150 ft. The 8-in. casing is perforated from 50 ft below ground level to the bottom of the well. A grout plug exists at the bottom portion of the well (see figure 6).



TYPE C1 VADOSE ZONE WELL

Figure 6

1.2.3 TYPE "D" Well – A Type D well consists of either a 6-in. or 8-in. diameter casing that extends from ground level to a depth of approximately 150 ft. The casing is perforated from 40 ft below ground level to approximately the bottom of the well. Based on available information, no grout exists at the bottom portion of the well (see figure 7).



TYPE D VADOSE ZONE WELL

Figure 7

..2.4 **TYPE "E" Well** – A Type E well consists of a 6-in. diameter casing that extends from ground level to a maximum depth of approximately 150 ft. The casing is perforated from 10 ft below ground level to approximately the bottom of the well. Based on available information, no grout exists at the bottom portion of the well (see figure 8).

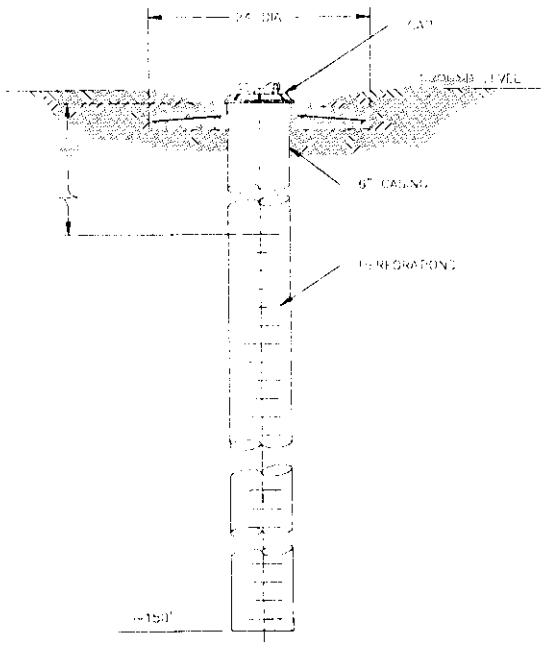
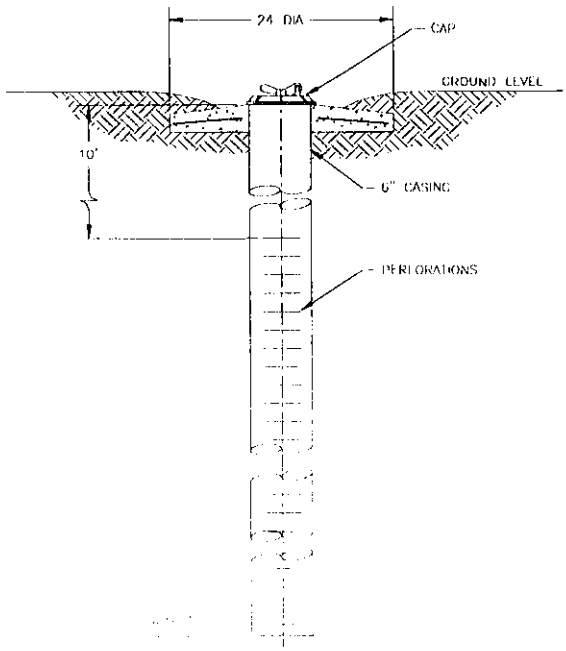


Figure 8

1.2.5 TYPE "F" Well – A Type F well consists of a 6-in. diameter casing that extends from ground level to various depths less than 150 ft. This well type is grouted at the top portion and extends from ground level to a maximum depth of approximately 20 ft. In some instances, an 8-in. diameter outer casing exists. Based on available information, no grout plug exists at the bottom of the well. However, the casing is perforated from 10 ft below ground to the bottom of the well (see figure 9).



TYPE F VADOSE ZONE WELL

Figure 9

1.2.6 TYPE "F1" Well – A Type F1 well consists of an 8-in. diameter casing that extends from ground level to various depths less than 150 ft. This well type has a grout seal at the top portion that extends from ground level with varying depths to a maximum of approximately 20 ft, in some instances a 10-in. or 12-in. diameter outer casing exists. A grout plug of various lengths exists at the bottom portion of the well. Based on available information, the casing is not perforated (see figure 10).

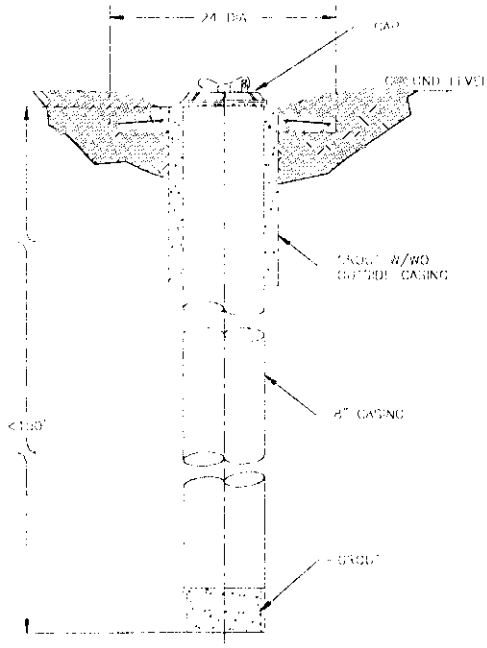
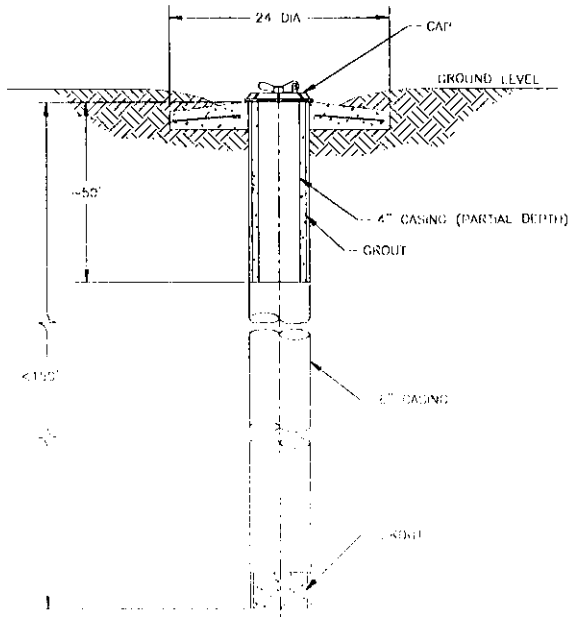


Figure 10

1.2.7 TYPE "G" Well – A Type G well consists of a single, 6-in. diameter casing with various depths to a maximum of approximately 150 ft. This well type is grouted at the top portion from ground level to a maximum of approximately 50 ft. The grouted top portion of the well consists of a 4-in. casing with a welded cap plate that is located inside the existing 6-in. casing The annulus between the casings is grouted the full length of the 4-in. casing. A grout plug of varying lengths exists at the bottom portion of the well. The 6-in.casing is not perforated, based on available information (see figure 11).



TYPE G VADOSE ZONE WELL

Figure 11

1.2.8 TYPE "G1" Well – A Type G1 well consists of a single casing, 6-in. diameter with various depths to approximately 150 ft. This well type is grouted at the top portion and extends from ground level to the bottom of the well. The grouted top portion of the well consists of a 4-in. casing with a welded cap plate that is located inside the existing 6-in. casing. A grout plug of varying lengths exists at the bottom of the well. The 6-in. casing is not perforated, based on available information (see figure 12).

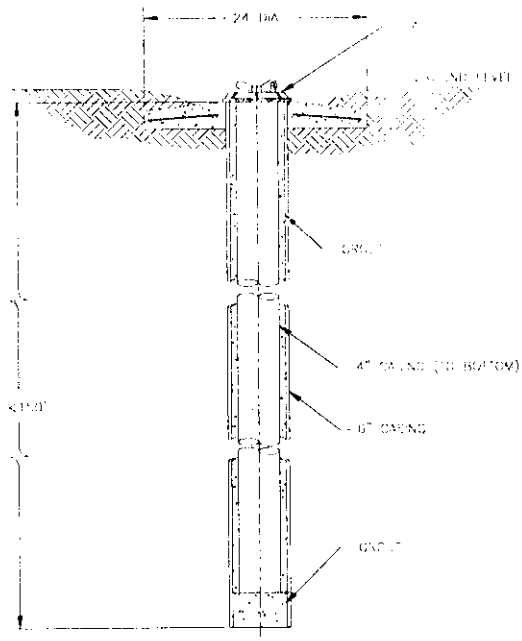
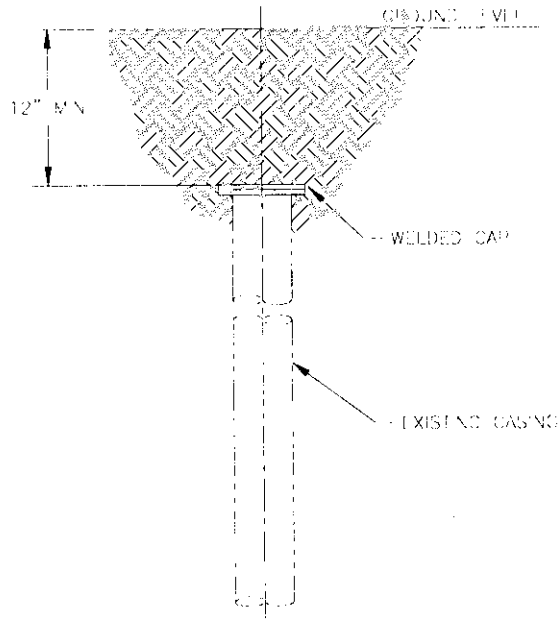


Figure 12

1.3 Abandoned and Decommissioned Wells

During the investigative phase of the study, review of existing documentation revealed numerous wells that previously had been reworked and either decommissioned or abandoned in place. Additional rework on the decommissioned wells should not be required, but will be addressed in this study. All the abandoned wells will require additional work to provide adequate closeout. A general description of the abandoned and decommissioned well types are provided in the following paragraphs.

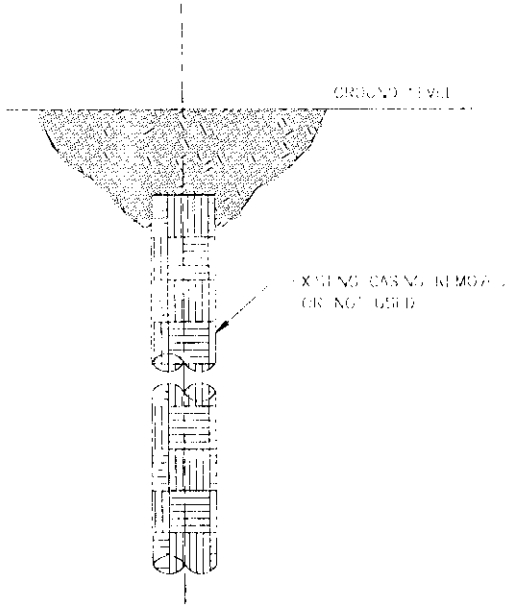
1.3.1 TYPE "H" Well – An H Type well is a well identified in the available documentation as abandoned. These wells have been cut off approximately 12-in. below ground level and had a welded cap installed (see figure 13).



TYPE H ABANDONED WELL

Figure 13

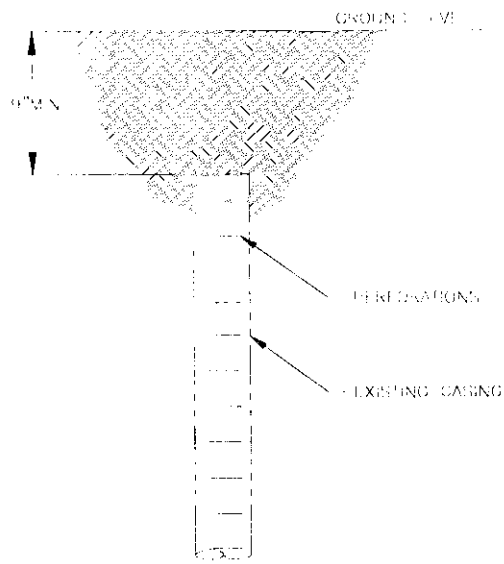
1.3.2 TYPE "H1" Well – A second type of "Abandoned Wells" are all wells identified in the available documentation as backfilled and sealed. There is little information on these wells except for location, depth and date completed. It's possible that a well was drilled for a single function and after use the casing (if one was used) was pulled, the hole backfilled, and the top sealed, see figure 14.



TYPE "H1" ABANDONED WELL

Figure 14

1.3.3 TYPE "I" Well – An I Type well includes all wells identified in the available documentation as decommissioned. The details vary, however adequate documentation is available for the majority of the cases (see figure 15).



TYPE I DECOMMISIONED WELL

Figure 15

APPENDIX B

WELL PRIORITIES BY FARM

241 - A - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 1 FOR DECOMMISSIONING						
10-00-06	299-E25-015	A4763	4*6	343	8/14/69	B1
10-00-07	299-E25-016	A6030, A4750	4*6	343	6/31/69	B1
10-00-08	299-E24-013	A4749	4*6	343	9/11/69 6/19/75	B1
10-01-05	299-E25-001	A4759	4/8	322	2/25/55	B1
NA	299-E25-148	NA	?	42	2/1/81	H1
NA	299-E25-149	NA	?	43	2/1/81	H1
NA	299-E25-152	NA	?	42	2/1/81	H1
NA	299-E25-171	NA	?	15	12/1/80	H1
NA	299-E25-172	NA	?	15	12/1/80	H1
Total Type B1 Wells =		**4**	**Length =**	**1351**		
Total Type H1 Wells =		**5**	**Length =**	**157**		
PRIORITY 2 FOR DECOMMISSIONING						
10-00-01	299-E25-057	A6046	8	150	6/8/55	D
10-00-02	NA	NA	NA	NA	NA	NA
10-00-04	299-E25-058	A6047	8	151	6/30/55	D
Total Outlying Wells =		**2**	**Length =**	**301**		
PRIORITY 3 FOR DECOMMISSIONING FOLLOWING RETRIEVAL						
10-01-01	299-E25-097	A6532	6	75	2/28/62	F
10-01-03	299-E25-091	A6530	6	75	4/1/62	F
10-01-04	299-E25-092	A6531	6	75	4/9/62	F
10-01-06	299-E24-070	A5925	6	125	4/1/62	F
10-01-08	299-E24-071	A5926	6	130	2/13/62	F
10-01-09	NA	B8052	6	73	NA	F
10-01-10	299-E24-072	A5927	6	75	5/3/62	F
10-01-11	299-E24-073	A5928	6	130	5/2/62	F
10-01-16	299-E25-170	A6585	4*6	50	1/1/66	G
10-01-28	299-E25-204	A6608	6	44	1/13/84	F
10-01-39	299-E25-192	A6598	6	45	3/1/82	F
10-02-01	299-E25-090	A6529	6	130	4/21/62	F
10-02-03	299-E25-083	A6522	6	130	4/20/62	F
10-02-05	299-E25-085	A6524	6	130	4/18/62	F
10-02-06	299-E25-086	A6525	6	130	4/17/62	F
10-02-08	299-E25-087	A6526	6	130	4/30/62	F
10-02-10	299-E25-088	A6527	6	130	2/9/62	F
10-02-11	299-E25-089	A6528	6	130	4/1/62	F
10-03-01	299-E25-078	A6517	6	130	5/1/62	F

241 - A - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
10-03-02	299-E25-079	A6518	6	130	4/30/62	F
10-03-04	299-E25-080	A6519	6	130	4/27/62	F
10-03-05	299-E25-081	A6520	6	130	4/26/62	F
10-03-07	299-E25-082	A6521	6	130	4/24/62	F
10-03-10	299-E25-055	A6044	8	151	5/31/55	F1
10-03-11	299-E25-084	A6523	6	85	4/7/64	F
10-04-01	299-E25-061	A6500	6	130	5/7/62	F
10-04-04	299-E25-056	A6045	8	151	6/2/55	F1
10-04-05	299-E25-063	A6502	6	130	4/16/62	F
10-04-07	299-E24-066	A5921	6	125	5/3/62	F
10-04-08	299-E24-067	A5922	8	130	6/28/56	F1
10-04-10	299-E24-068	A5923	4*6	122	5/4/62	G
10-04-12	299-E24-069	A5924	6	123	5/31/62	F
10-05-02	299-E25-068	A6507	4*6	122	5/8/62	G
10-05-05	299-E25-070	A6509	6	75	4/5/62	F
10-05-07	299-E25-071	A6510	6	75	4/12/62	F
10-05-08	299-E25-098	A6533	6	30	1/26/66	F
10-05-10	299-E25-066	A6505	6	130	4/26/62	F
10-05-12	299-E25-067	A6506	6	125	4/12/62	F
10-06-02	299-E25-074	A6513	6	130	5/2/62	F
10-06-04	299-E25-075	A6514	6	130	5/1/62	F
10-06-05	299-E25-076	A6515	6	75	4/30/62	F
10-06-07	299-E25-077	A6516	6	130	2/1/62	F
10-06-09	299-E25-069	A6508	6	130	4/8/64	F
10-06-10	299-E25-072	A6511	6	130	4/10/62	F
10-06-12	299-E25-073	A6512	4*6	130	5/8/62	G
NA	299-E25-051	A6040	8	80	12/8/52	F1
NA	299-E24-65	NA	8	50	12/1/52	F1
Total Monitoring Wells =		**48**	**Length =**	**5271**		
Total Farm Wells =		**59**	**Length =**	**7080**		

241 - AX - FARM WELLS

WELL NUMBER			Dia.	Depth	Date	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 1 FOR DECOMMISSIONING						
11-02-08	299-E25-110	A6546	6	100	2/14/75	H
NA	299-E25-137	NA	4	80	12/31/60	H
NA	299-E25-138	NA	4	80	12/31/60	H
NA	299-E25-139	NA	4	80	12/31/60	H
NA	299-E25-140	NA	4	80	12/31/60	H
NA	299-E25-141	NA	4	52.5	12/31/60	H
NA	299-E25-142	NA	4	80	12/31/60	H
NA	299-E25-143	NA	4	80	12/31/60	H
NA	299-E25-144	NA	4	80	12/31/60	H
NA	299-E25-145	NA	2	80	12/31/60	H
Total Type H Abandoned Wells =		**10**	**Length =**	**792.5**		
PRIORITY 1 FOR DECOMMISSIONING						
NA	299-E25-013	A4762	8	317	10/1/63	B
NA	299-E25-040	A4789	4	274	9/1/89	B
NA	299-E25-041	A4790	4	279	9/1/89	B
Total Type B Wells =		**3**	**Length =**	**870**		
PRIORITY 2 FOR DECOMMISSIONING						
NA	299-E25-173	A6588	6	19	7/1/81	F
NA	299-E25-174	A6589	6	18	7/1/81	F
NA	299-E25-179	A6590	6	16	7/1/81	F
NA	299-E25-182	A6592	6	12	8/1/81	F
NA	299-E25-183	A6593	6	12	7/1/81	F
NA	299-E25-185	A6595	6	15	8/1/81	F
Total Outlying Wells =		**6**	**Length =**	**92**		
PRIORITY 3 FOR DECOMMISSIONING FOLLOWING RETRIEVAL						
11-01-01	299-E25-099	A6534	6	100	11/26/74	F
11-01-02	299-E25-100	A6535	6	100	12/2/74	F
11-01-04	299-E25-101	A6537	6	100	1/15/75	F
11-01-05	299-E25-102	A6538	6	100	1/17/75	F
11-01-07	299-E25-103	A6539	6	100	1/23/75	F
11-01-09	299-E25-104	A6540	6	100	12/23/74	F
11-01-11	299-E25-105	A6541	6	100	12/10/74	F
11-02-02	299-E25-106	A6542	6	100	1/4/75	F
11-02-04	299-E25-107	A6543	6	100	2/21/75	F
11-02-05	299-E25-108	A6544	6	100	2/3/75	F
11-02-07	299-E25-109	A6545	6	100	2/12/75	F
11-02-10	299-E25-111	A6547	6	100	2/18/75	F

241 - AX - FARM WELLS

WELL NUMBER			Dia.	Depth	Date	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
11-02-11	299-E25-112	A6548	6	100	1/21/75	F
11-03-02	299-E25-113	A6549	6	100	1/30/75	F
11-03-05	299-E25-114	A6550	6	100	12/24/74	F
11-03-07	299-E25-115	A6551	6	100	2/25/75	F
11-03-09	299-E25-116	A6552	6	120	1/27/75	F
11-03-10	299-E25-117	A6553	6	100	1/3/75	F
11-03-12	299-E25-118	A6554	6	100	12/13/74	F
11-04-01	299-E25-119	A6555	6	100	12/30/74	F
11-04-05	299-E25-120	A6556	6	100	2/20/75	F
11-04-07	299-E25-121	A6557	6	95.8	3/5/75	F
11-04-08	299-E25-122	A6558	6	100	2/28/75	F
11-04-10	299-E25-123	A6559	6	100	3/4/75	F
11-04-11	299-E25-124	A6560	6	130	1/24/75	F
11-02-22	299-E25-127	A6561	6	120	5/29/75	F
11-02-12	299-E25-128	B2899	6	54	5/25/75	F
11-02-23	299-E25-128	A6562	6	54	5/25/75	F
11-01-10	299-E25-131	B2896	6	73	NA	F
11-02-01	299-E25-132	A6563	6	130	4/4/78	F
11-02-03	299-E25-133	B2898	6	75	1/1/78	F
11-04-19	299-E25-147	A6565	6	130	3/1/78	F
Total Monitoring Wells =		**32**	**Length =**	**3181.8**		
Total Farm Wells =		**51**	**Length =**	**4936.3**		

241 - B- FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 1 FOR DECOMMISSIONING						
20-10-24	299-E33-273	A7073	6	24	5/22/75	H
Total Type H Abandoned Wells =		**1**	**Length =**	**24**		
PRIORITY 2 FOR DECOMMISSIONING						
20-00-01	299-E33-053	A6861	12/10	151	12/7/44	C
20-00-02	299-E33-051	A6859	12/10	151	11/30/44	C
20-00-05	299-E33-052	A6860	12/10	154	11/28/44	C
20-00-07	299-E33-056	A6862	12/10	150	12/6/44	C
20-00-09	299-E33-057	A6865	12/10	150	12/7/44	C
20-00-11	299-E33-055	A6863	12/10	159	12/15/44	C
20-00-12	NA	NA	NA	NA	NA	NA
20-00-23	NA	NA	6	NA	NA	NA
Total Outlying Wells =		**8**	**Length =**	**915**		
PRIORITY 3 FOR DECOMMISSIONING FOLLOWING RETRIEVAL						
20-01-01	299-E33-261	A7068	6	100	6/7/74	F
20-01-03	299-E33-220	A7027	6	135	5/16/73	F
20-01-05	299-E33-262	A7069	6	100	6/4/74	F
20-01-06	299-E33-274	A7074	6	60	5/20/75	F
20-01-07	299-E33-263	A7070	6	100	5/30/74	F
20-01-11	299-E33-264	A7071	6	100	6/3/74	F
20-02-03	299-E33-179	A6987	6	100	2/25/72	F
20-02-05	299-E33-180	A6988	6	140	3/9/72	F
20-02-07	299-E33-181	A6989	6	100	3/7/72	F
20-02-09	299-E33-182	A6990	6	100	2/15/72	F
20-02-11	299-E33-183	A6991	6	100	2/17/71	F
20-03-02	299-E33-184	A6992	6	115	2/10/72	F
20-03-03	299-E33-185	A6993	6	100	2/29/72	F
20-03-06	299-E33-186	A6994	6	135	2/22/72	F
20-03-09	299-E33-187	A6995	6	100	1/18/72	F
20-03-11	299-E33-188	A6996	6	100	2/8/72	F
20-04-03	299-E33-219	A7026	6	100	5/7/73	F
20-04-06	299-E33-221	A7028	6	135	6/5/73	F
20-05-06	299-E33-218	A7025	6	120	5/22/73	F
20-06-02	299-E33-189	A6997	6	100	2/1/72	F
20-06-03	299-E33-190	A6998	6	140	3/3/72	F
20-06-06	299-E33-191	A6999	6	100	3/1/72	F
20-06-11	299-E33-192	A7000	6	125	1/13/72	F
20-07-02	299-E33-212	A7019	6	100	8/22/73	F
20-07-05	299-E33-149	A6957	6	100	4/14/70	F

241 - B- FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
20-07-08	299-E33-148	A6956	6	135	4/16/73	F
20-07-11	299-E33-147	A6955	6	100	4/20/70	F
20-08-02	299-E33-054	A6862	12/10	170	12/18/44	C
20-08-03	299-E33-193	A7001	6	135	3/13/72	F
20-08-05	299-E33-194	A7002	6	100	3/15/72	F
20-08-07	299-E33-195	A7003	6	100	3/17/72	F
20-08-09	299-E33-196	A7004	6	103	2/7/72	F
20-09-02	299-E33-197	A7005	6	100	1/18/72	F
20-09-06	299-E33-198	A7006	6	100	2/8/72	F
20-09-11	299-E33-200	A7008	6	130	1/12/72	F
20-10-02	299-E33-213	A7020	6	100	8/10/73	F
20-10-07	299-E33-216	A7023	6	100	9/17/73	F
20-10-09	299-E33-215	A7022	6	135	9/20/73	F
20-10-12	299-E33-214	A7021	6	120	8/3/73	F
20-11-09	299-E33-217	A7024	6	120	5/30/73	F
20-12-02	299-E33-201	A7009	6	125	1/7/72	F
20-12-03	299-E33-199	A7007	6	100	2/3/72	F
20-12-06	299-E33-202	A7010	6	100	1/10/72	F
20-12-07	299-E33-203	A7011	6	100	1/12/72	F
20-12-11	299-E33-204	A7012	6	100	1/20/72	F
Total Monitoring Wells =		**45**	**Length =**	**4978**		
Total Farm Wells =		**54**	**Length =**	**5917**		

241 - BX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
WELLS CURRENTLY DECOMMISSIONED						
NA	299-E33-230	A7037	6	30	10/18/73	I/H
21-00-03	299-E33-140	A6948	6	100	5/27/70	I
Total # type I Decommissioned W		**2**	**Length =**	**130**		
PRIORITY 1 FOR DECOMMISSIONING						
NA	299-E33-136	A6944	NA	14	6/5/70	H
NA	299-E33-137	A6945	8	14	5/28/70	H
21-04-04	299-E33-277	A7076	6	105	4/12/77	F(H)
Total # type H Abandoned Wells =		**3**	**Length =**	**133**		
PRIORITY 2 FOR DECOMMISSIONING						
21-00-01	299-E33-063	A6871	8	150	3/4/48	D
21-00-02	299-E33-142	A6950	6	100	7/1/70	F
21-00-05	299-E33-062	A6870	8	135	3/5/48	D
21-00-07	299-E33-077	A6885	8	150	2/28/48	D
21-00-09	299-E33-092	A6900	6	75	4/14/67	F
21-00-11	299-E33-065	A6873	8	150	11/21/47	D
21-00-21	299-E33-078	A6886	8	150	3/1/48	D
21-00-22	299-E33-093	A6901	6	75	4/26/67	F
21-27-01	299-E33-141	A6949	6	100	6/26/70	F
21-27-02	299-E33-138	A6946	6	100	5/18/70	F
21-27-06	299-E33-139	A6947	6	100	5/22/70	F
21-27-07	299-E33-134	A6942	6	150	7/29/70	F
21-27-08	299-E33-146	A6954	6	150	8/12/70	F
21-27-09	299-E33-133	A6941	6	150	7/26/70	F
21-27-10	299-E33-132	A6940	6	150	7/24/70	F
21-27-11	299-E33-061	A6869	8	150	3/4/48	D
Total Outlying Wells =		**17**	**Length =**	**2,035**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
E33-41	299-E33-041	A4867	4*6	254	NA	B1
Total Type B1 Wells =		**1**	**Length =**	**254**		
Tank is adjacent to BX farm boundry, is constructed to RCRA standards, and a part of the ground water						
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
21-01-01	299-E33-144	A6952	6	100	8/4/70	F
21-01-02	299-E33-135	A6943	6	100	5/18/70	F
21-02-01	299-E33-129	A6937	6	100	4/27/70	F
21-02-03	299-E33-145	A6953	6	100	8/6/70	F

241 - BX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
21-02-04	299-E33-027	A4851	6	265	7/23/70	G1
21-02-06	299-E33-143	A6951	6	100	7/31/70	F
21-02-07	299-E33-130	A6938	6	100	4/22/70	F
21-02-11	299-E33-131	A6939	6	100	4/23/70	F
21-03-03	299-E33-239	A7046	6	100	10/16/73	F
21-03-05	299-E33-229	A7036	6	100	11/2/73	F
21-03-07	299-E33-282	A7081	6	105	1/2/76	F
21-03-11	299-E33-275	A7075	6	100	1/7/76	F
21-03-12	299-E33-238	A7045	6	100	10/25/73	F
21-04-01	299-E33-281	A7080	6	100	4/5/77	F
21-04-03	299-E33-226	A7033	6	100	10/3/73	F
21-04-04	299-E33-278	A7077	6	105	5/2/77	F
21-04-06	299-E33-224	A7031	6	100	10/1/73	F
21-04-08	299-E33-279	A7078	6	100	4/25/77	F
21-04-11	299-E33-280	A7079	6	100	4/14/77	F
21-05-02	299-E33-158	A6966	6	100	11/30/71	F
21-05-03	299-E33-159	A6967	6	100	11/24/71	F
21-05-05	299-E33-160	A6968	6	100	11/18/71	F
21-05-06	299-E33-161	A6969	6	100	11/22/71	F
21-05-10	299-E33-162	A6970	6	100	12/15/71	F
21-05-12	299-E33-157	A6965	6	100	12/10/71	F
21-06-01	299-E33-163	A6971	6	100	12/7/71	F
21-06-02	299-E33-164	A6972	6	100	12/3/71	F
21-06-05	299-E33-165	A6973	6	100	12/1/71	F
21-06-10	299-E33-166	A6974	6	100	12/9/71	F
21-07-03	299-E33-225	A7032	6	100	9/27/73	F
21-07-06	299-E33-222	A7029	6	100	9/27/73	F
21-08-02	299-E33-064	A6872	8	150	11/20/47	D
21-08-04	299-E33-234	A7041	6	100	9/19/73	F
21-08-05	299-E33-235	A7042	6	100	9/26/73	F
21-08-06	299-E33-151	A6959	6	100	1/6/72	F
21-08-07	299-E33-152	A6960	6	100	1/5/72	F
21-08-10	299-E33-236	A7043	6	100	10/5/73	F
21-08-12	299-E33-150	A6958	6	100	1/30/72	F
21-09-02	299-E33-257	A7064	6	100	12/17/73	F
21-09-04	299-E33-233	A7040	6	100	10/9/73	F
21-09-08	299-E33-258	A7065	6	100	12/18/73	F
21-09-12	299-E33-231	A7038	6	100	10/12/73	F
21-10-01	299-E33-167	A6975	6	100	9/9/71	F
21-10-03	299-E33-223	A7030	6	100	9/24/73	F
21-10-05	299-E33-168	A6976	6	100	9/13/71	F
21-10-07	299-E33-169	A6977	6	100	9/15/71	F

241 - BX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
21-10-11	299-E33-170	A6978	6	100	9/17/71	F
21-11-03	299-E33-237	A7044	6	100	10/2/73	F
21-11-04	299-E33-173	A6981	6	100	8/31/71	F
21-11-05	299-E33-171	A6979	6	100	9/7/71	F
21-11-07	299-E33-172	A6980	6	100	8/26/71	F
21-11-10	299-E33-174	A6982	6	100	8/24/71	F
21-11-11	299-E33-175	A6983	6	100	8/20/71	F
21-12-02	299-E33-153	A6961	6	100	12/21/71	F
21-12-05	299-E33-154	A6962	6	100	12/28/71	F
21-12-07	299-E33-155	A6963	6	100	1/4/71	F
21-12-10	299-E33-156	A6964	6	100	12/30/71	F
21-12-12	299-E33-232	A7039	6	100	10/31/73	F
NA	299-E33-228	A7035	6	100	10/16/73	F
NA	299-E33-227	A7034	6	100	7/27/73	F
Total Monitoring Wells =		**60**	**Length =**	**6,225**		
Total Farm Wells =		**83**	**Length =**	**8,777**		

241 - BY - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 1 FOR DECOMMISSIONING						
22-02-07	299-E33-009	A4873	4*8	275	7/21/49	B1
Total Type B1 Wells =		**1**	**Length =**	**275**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
22-00-01	299-E33-085	A6893	8	150	8/2/49	D
22-00-02	299-E33-240	A7047	6	100	12/7/73	F
22-00-03	299-E33-084	A6892	8	150	7/21/49	D
22-00-04	299-E33-241	A7048	6	100	12/12/73	F
22-00-05	299-E33-083	A6891	8	150	7/11/49	D
22-00-10	299-E33-088	A6896	8	150	8/17/49	D
22-01-01	299-E33-176	A6984	6	100	12/22/71	F
22-01-03	299-E33-245	A7052	6	100	5/16/74	F
22-01-04	299-E33-177	A6985	6	100	12/26/71	F
22-01-07	299-E33-178	A6986	6	100	12/16/71	F
22-01-10	299-E33-246	A7053	6	100	5/7/74	F
22-02-01	299-E33-101	A6909	6	100	7/10/70	F
22-02-02	299-E33-227	A7034	6	100	7/27/73	F
22-02-05	299-E33-228	A7035	6	100	10/16/73	F
22-02-09	299-E33-102	A6910	6	100	9/2/70	F
22-03-01	299-E33-104	A6912	6	100	8/7/70	F
22-03-04	299-E33-211	A7018	6	100	12/5/72	F
22-03-05	299-E33-103	A6911	6	100	8/12/70	F
22-03-06	299-E33-210	A7017	6	100	12/22/72	F
22-03-07	299-E33-242	A7049	6	100	12/14/73	F
22-03-08	299-E33-244	A7051	6	100	12/6/73	F
22-03-09	299-E33-105	A6913	6	100	8/6/70	F
22-03-10	299-E33-243	A7050	6	100	12/7/73	F
22-04-01	299-E33-106	A6914	6	100	9/2/70	F
22-04-05	299-E33-107	A6915	6	100	7/21/70	F
22-04-07	299-E33-248	A7055	6	100	5/13/74	F
22-04-09	299-E33-108	A6916	6	125	8/28/70	F
22-04-11	299-E33-249	A7056	6	100	5/1/74	F
22-05-01	299-E33-109	A6917	6	100	7/9/70	F
22-05-05	299-E33-110	A6918	6	100	7/14/70	F
22-05-09	299-E33-111	A6919	6	100	7/27/70	F
22-06-01	299-E33-112	A6920	6	100	8/3/70	F
22-06-05	299-E33-113	A6921	6	100	7/14/70	F
22-06-07	299-E33-086	A6894	8	150	8/4/49	D
22-06-09	299-E33-114	A6922	6	100	7/30/70	F
22-06-11	299-E33-250	A7057	6	100	5/3/74	F

241 - BY - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
22-07-01	299-E33-115	A6923	6	100	8/25/70	F
22-07-02	299-E33-206	A7013	6	100	1/4/73	F
22-07-05	299-E33-116	A6924	6	100	7/23/70	F
22-07-07	299-E33-251	A7058	6	100	5/9/74	F
22-07-09	299-E33-117	A6925	6	100	8/25/70	F
22-07-10	299-E33-252	A7059	6	100	5/9/74	F
22-08-01	299-E33-118	A6926	6	100	7/22/70	F
22-08-02	299-E33-208	A7015	6	100	1/19/73	F
22-08-05	299-E33-119	A6927	6	100	7/28/70	F
22-08-06	299-E33-207	A7014	6	100	1/2/73	F
22-08-07	299-E33-087	A6895	8	150	8/15/49	D
22-08-09	299-E33-120	A6928	6	100	8/4/70	F
22-08-12	299-E33-209	A7016	6	100	1/26/73	F
22-09-01	299-E33-123	A6931	6	100	2/24/70	F
22-09-02	299-E33-259	A7066	6	100	6/10/74	F
22-09-05	299-E33-122	A6930	6	100	2/20/70	F
22-09-07	299-E33-260	A7067	6	100	6/6/74	F
22-09-08	299-E33-121	A6929	6	100	2/17/70	F
22-09-11	299-E33-253	A7060	6	100	5/2/74	F
22-10-05	299-E33-124	A6932	6	100	8/21/70	F
22-10-07	299-E33-254	A7061	6	100	5/7/74	F
22-10-09	299-E33-255	A7062	6	100	5/3/74	F
22-10-10	299-E33-125	A6933	6	100	8/19/70	F
22-11-01	299-E33-126	A6934	6	100	8/20/70	F
22-11-05	299-E33-127	A6935	6	100	8/17/70	F
22-11-08	299-E33-256	A6864	6	151	12/31/44	C
22-11-09	299-E33-128	A6936	6	100	8/13/70	F
22-12-01	299-E33-100	A6908	6	100	11/30/67	F
22-12-03	299-E33-094	A6902	6	100	11/15/67	F
22-12-05	299-E33-095	A6903	6	100	11/22/67	F
22-12-06	299-E33-096	A6904	6	100	12/1/67	F
22-12-07	299-E33-097	A6905	6	100	11/29/67	F
22-12-09	299-E33-098	A6906	6	100	12/6/67	F
22-12-10	299-E33-099	A6907	6	100	12/5/67	F
Total Monitoring Wells =		**70**	**Length =**	**7,376**		
Total Farm Wells =		**71**	**Length =**	**7,651**		

241 - C - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 2 FOR DECOMMISSIONING						
30-00-03	299-E27-054	A6679	12/8	155	01/04/45	C1
30-00-10	299-E27-053	A6678	12/8	150	12/14/44	C1
30-00-11	299-E27-121	A6741	6	60	03/31/77	F
30-00-12	299-E27-052	A6677	12/8	150	12/22/44	C1
30-00-13	299-E27-124	A6744	6	55	03/28/77	F
30-00-22	299-E27-120	A6740	6	55	03/18/77	F
30-00-24	299-E27-122	A6742	6	59	03/31/77	F
Total Outlying Wells =		7	**Length =**	**684**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
30-00-01	299-E27-056	A6681	12/8	146	12/27/44	C1
30-00-06	299-E27-055	A6680	12/10	154	12/30/44	C
30-00-09	299-E27-057	A6682	12/10	150	12/31/44	C
30-01-01	299-E27-060	A6685	6	100	03/20/70	F
30-01-06	299-E27-059	A6684	6	100	02/02/69	F
30-01-09	299-E27-058	A6683	6	100	11/08/70	F
30-01-12	299-E27-061	A6686	6	100	03/16/70	F
30-03-01	299-E27-074	A6699	6	125	06/28/74	F
30-03-03	299-E27-075	A6700	6	100	07/02/74	F
30-03-05	299-E27-076	A6701	6	100	07/31/74	F
30-03-07	299-E27-077	A6702	6	100	09/19/74	F
30-03-09	299-E27-078	A6703	6	100	06/25/74	F
30-04-01	299-E27-115	A6735	6	50	07/09/74	F
30-04-02	299-E27-067	A6692	6	135	12/04/72	F
30-04-03	299-E27-116	A6736	6	50	07/10/74	F
30-04-04	299-E27-079	A6704	6	100	06/19/74	F
30-04-05	299-E27-080	A6705	6	100	07/22/74	F
30-04-08	299-E27-066	A6691	6	145	11/30/72	F
30-04-12	299-E27-065	A6690	6	135	12/20/72	F
30-05-02	299-E27-070	A6695	6	130	11/20/72	F
30-05-03	299-E27-081	A6706	6	100	09/18/74	F
30-05-04	299-E27-069	A6694	6	120	12/22/72	F
30-05-05	299-E27-082	A6707	6	100	06/21/74	F
30-05-06	299-E27-119	A6739	6	60	07/30/74	F
30-05-07	299-E27-118	A6738	6	70	07/12/74	F
30-05-08	299-E27-117	A6737	6	50	07/15/74	F
30-05-09	299-E27-083	A6708	6	100	06/18/74	F
30-05-10	299-E27-068	A6693	6	135	11/27/72	F
30-06-02	299-E27-072	A6697	6	125	11/10/72	F
30-06-03	299-E27-084	A6709	6	100	06/27/74	F

241 - C - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
30-06-04	299-E27-073	A6698	6	130	11/08/72	F
30-06-09	299-E27-085	A6710	6	100	07/08/74	F
30-06-10	299-E27-071	A6696	6	130	11/16/72	F
30-06-12	299-E27-086	A6711	6	100	08/05/74	F
30-07-01	299-E27-087	A6712	6	100	09/11/74	F
30-07-02	299-E27-088	A6713	6	100	09/10/74	F
30-07-05	299-E27-089	A6714	6	100	10/01/74	F
30-07-07	299-E27-090	A6715	6	100	10/03/74	F
30-07-08	299-E27-091	A6716	6	100	10/31/74	F
30-07-10	299-E27-092	A6717	6	100	09/06/74	F
30-07-11	299-E27-093	A6718	6	100	07/18/74	F
30-08-02	299-E27-094	A6719	6	100	09/20/74	F
30-08-03	299-E27-051	A6676	12/8	150	12/20/44	C1
30-08-12	299-E27-095	A6720	6	100	09/13/74	F
30-09-01	299-E27-096	A6721	6	100	07/29/74	F
30-09-02	299-E27-097	A6722	6	100	06/14/74	F
30-09-06	299-E27-098	A6723	6	100	09/16/74	F
30-09-07	299-E27-135	A6754	6	125	03/31/82	F
30-09-10	299-E27-099	A6724	6	100	07/17/74	F
30-09-11	299-E27-100	A6725	6	100	07/25/74	F
30-10-01	299-E27-101	A6726	6	100	09/24/74	F
30-10-02	299-E27-102	A6727	6	100	09/04/74	F
30-10-09	299-E27-103	A6728	6	100	09/30/74	F
30-10-11	299-E27-104	A6729	6	100	04/24/75	F
30-11-01	299-E27-063	A6688	6	100	02/09/70	F
30-11-05	299-E27-105	A6730	6	100	04/21/75	F
30-11-06	299-E27-064	A6689	6	100	02/25/70	F
30-11-09	299-E27-062	A6687	6	100	04/03/70	F
30-11-11	299-E27-106	A6731	6	100	04/16/75	F
30-12-01	299-E27-107	A6732	6	100	04/10/75	F
30-12-03	299-E27-108	A6733	6	100	04/07/75	F
30-12-09	299-E27-109	A6734	6	100	04/14/75	F
30-12-13	299-E27-125	A6745	6	130	04/25/78	F
Total Monitoring Wells =		**63**	**Length =**	**6,645**		
Total Farm Wells =		**70**	**Length =**	**7,329**		

241 - S - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 1 FOR DECOMMISSIONING						
40-02-02	N/A	N/A	6	100	02/27/74	H
Total Type H Abandoned Wells		**1**	**Length =**	**100**		
PRIORITY 1 FOR DECOMMISSIONING						
40-00-04	299-W23-001	A4979	4*6	262	06/04/52	B1
40-10-01	299-W23-012	A4981	4*6	265	10/01/70	B1
Total Type B1 Wells =		**2**	**Length =**	**527**		
PRIORITY 2 FOR DECOMMISSIONING						
40-00-02	299-W23-051	A7887	6	150	03/07/52	D
40-00-06	299-W23-056	A7892	6	150	04/25/52	D
Total Outlying Wells =		**2**	**Length =**	**300**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
40-01-01	299-W23-145	A7981	6	130	09/29/71	F
40-01-04	299-W23-179	A8015	6	100	03/05/74	F
40-01-06	299-W23-146	A7982	6	100	09/29/71	F
40-01-08	299-W23-147	A7983	6	100	10/01/71	F
40-01-10	299-W23-180	A8016	6	100	03/21/74	F
40-02-01	299-W23-148	A7984	6	130	09/01/71	F
40-02-03	299-W23-188	A8024	6	150	03/18/52	D
40-02-04	299-W23-052	A7888	5	144	03/01/52	F
40-02-05	299-W23-181	A8017	6	100	03/27/74	F
40-02-07	299-W23-149	A7985	6	100	09/30/71	F
40-02-08	299-W23-189	A8025	6	100	02/19/74	F
40-02-10	299-W23-150	A7986	6	100	10/04/71	F
40-02-11	299-W23-182	A8018	6	100	03/21/74	F
40-03-01	299-W23-151	A7987	6	100	10/06/71	F
40-03-03	299-W23-212	A8046	6	130	06/06/78	F
40-03-05	299-W23-053	A7889	6	150	03/01/52	D
40-03-06	299-W23-152	A7988	6	100	10/04/71	F
40-03-08	299-W23-183	A8019	6	100	03/18/74	F
40-03-09	299-W23-153	A7989	6	130	10/06/71	F
40-03-11	299-W23-184	A8020	6	100	03/25/74	F
40-04-01	299-W23-123	A7959	6	100	06/05/70	F
40-04-05	299-W23-124	A7960	6	135	05/28/70	F
40-04-07	299-W23-122	A7958	6	100	06/10/70	F
40-04-08	299-W23-177	A8013	6	50	NA	F
40-05-03	299-W23-154	A7990	6*8	100	10/14/71	F
40-05-05	299-W23-054	A7890	5	150	04/17/52	D

241 - S - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
40-05-07	299-W23-155	A7991	6	100	10/22/71	F
40-05-08	299-W23-199	A8035	6	105	03/11/76	F
40-05-10	299-W23-156	A7992	6*8	105	04/13/71	F
40-06-02	299-W23-157	A1993	6	100	10/22/71	F
40-06-04	299-W23-213	A8047	6	130	06/01/78	F
40-06-05	299-W23-055	A7891	6	150	04/01/52	D
40-06-06	299-W23-158	A7994	6	100	11/25/71	F
40-06-08	299-W23-201	A8037	6	105	03/01/76	F
40-06-09	299-W23-159	A7995	6	100	10/25/71	F
40-07-01	299-W23-160	A7996	6	100	10/14/71	F
40-07-04	299-W23-185	A8021	6	100	03/25/74	F
40-07-06	299-W23-161	A7997	6	100	10/08/71	F
40-07-08	299-W23-186	A8022	6	100	03/27/74	F
40-07-10	299-W23-162	A7998	6	100	10/08/71	F
40-07-11	299-W23-187	A8023	6	100	04/03/74	F
40-08-01	299-W23-178	A8014	6	105	03/06/76	F
40-08-06	299-W23-163	A7999	6	100	11/04/71	F
40-08-08	299-W23-202	A8038	6	105	02/28/76	F
40-08-09	299-W23-164	A8000	6	100	10/18/71	F
40-08-12	299-W23-216	A8048	6	130	06/20/71	F
40-09-01	299-W23-200	A8036	6	105	03/15/76	F
40-09-02	299-W23-165	A8001	6	100	10/20/71	F
40-09-05	299-W23-057	A7893	6	150	04/09/52	D
40-09-06	299-W23-166	A8002	6	100	10/26/71	F
40-09-08	299-W23-203	A8039	6	100	03/11/76	F
40-09-09	299-W23-167	A8003	6	140	10/27/71	F
40-10-03	299-W23-168	A8004	6	100	11/16/71	F
40-10-05	299-W23-204	A8040	6	105	03/18/76	F
40-10-06	299-W23-169	A8005	6	140	11/10/71	F
40-10-08	299-W23-205	A8041	6	105	03/23/76	F
40-10-09	299-W23-170	A8006	5	100	11/11/71	F
40-10-13	299-W23-218	A8049	6	130	07/01/78	F
40-11-01	299-W23-171	A8007	6	145	11/09/71	F
40-11-05	299-W23-206	A8042	6	105	02/27/76	F
40-11-07	299-W23-172	B2900	6	100	11/08/71	F
40-11-08	299-W23-207	A8043	6	105	03/02/76	F
40-11-09	299-W23-173	A8008	6	100	10/29/71	F
40-12-02	299-W23-174	A8009	6	100	10/28/71	F
40-12-04	299-W23-220	A8050	6	130	06/28/78	F
40-12-06	299-W23-175	A8010	6	145	11/03/71	F
40-12-07	299-W23-208	A8044	6	105	03/06/76	F
40-12-09	299-W23-176	A8011	6	100	11/29/71	F

241 - S - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
Total Monitoring Wells =		68	Length =	7,544		
Total Farm Wells		73	Length =	8,471		

241 - SX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
WELLS CURRENTLY DECOMMISSIONED						
41-09-39	299-W23-234	B2828	12	225	06/01/96	I
Total Decommissioned Wells =		**1**	**Length =**	**225**		
PRIORITY 1 FOR DECOMMISSIONING						
41-12-1A	NA	NA	6	20.3	NA	H
Total Type H Abandoned Wells		**1**	**Length =**	**20**		
PRIORITY 1 FOR DECOMMISSIONING						
W23-7	299-W23-007	A4990	4*6	250	11/01/69	B
NA	NA	B8809	NA	225	NA	B
41-00-03	299-W23-002	A4985	4*8	236	09/09/54	B1
41-00-04	299-W23-005	A4988	4*8	250	10/02/69	B1
41-00-05	299-W23-003	A4986	4*8	232	02/28/56	B1
Total Type B & B1 Wells =		**5**	**Length =**	**1,193**		
PRIORITY 2 FOR DECOMMISSIONING						
41-00-02	299-W23-061	A7897	8	102	09/23/54	E
41-00-06	299-W23-232	NA	6*12	68	08/08/96	F
41-00-08	299-W23-065	A7901	8	125	03/14/56	F1
Total Outlying Wells =		**3**	**Length =**	**295**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
41-01-01	299-W23-132	A7968	6	140	03/21/72	F1
41-01-04	299-W23-190	A8026	6	100	11/01/74	F
41-01-06	299-W23-133	A7969	6	100	12/27/71	F
41-01-07	299-W23-060	A7896	8	101	09/21/54	E
41-01-08	299-W23-134	A7970	6	100	01/03/72	F
41-01-10	299-W23-191	A8027	6*8	100	11/20/74	F
41-01-11	299-W23-192	A8028	6	100	11/18/74	F
41-02-02	299-W23-135	A7971	6	140	01/14/72	F
41-02-05	299-W23-223	A8051	6	130	07/31/78	F
41-02-07	299-W23-059	A7895	8	101	09/16/54	E
41-02-08	299-W23-136	A7972	6	100	01/18/72	F
41-02-11	299-W23-193	A8029	6	100	10/28/74	F
41-03-02	299-W23-194	A8030	6	100	10/30/74	F
41-03-05	299-W23-195	A8031	6	100	11/25/74	F
41-03-06	299-W23-138	A7974	6	100	02/17/72	F
41-03-09	299-W23-139	A7975	6	100	02/11/72	F
41-03-10	299-W23-196	A8032	6	100	10/25/74	F

241 - SX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
41-03-12	299-W23-137	A7973	6	140	01/24/72	F
41-04-01	299-W23-140	A7976	6	100	03/15/72	F
41-04-03	299-W23-197	A8033	6	100	11/12/74	F
41-04-05	299-W23-198	A8034	6	100	11/14/74	F
41-04-07	299-W23-062	A7898	6	101	09/29/54	E
41-04-08	299-W23-225	A8052	6	130	04/04/78	F
41-04-11	299-W23-141	A7977	6	100	03/09/72	F
41-05-02	299-W23-130	A7966	6	130	02/01/62	F
41-05-03	299-W23-131	A7967	6	130	02/01/62	F
41-05-05	299-W23-125	A7961	6	135	03/30/70	F
41-05-07	299-W23-126	A7962	6	130	02/01/62	F
41-05-08	299-W23-127	A7963	6	130	02/01/62	F
41-05-10	299-W23-128	A7964	6	130	02/01/62	F
41-05-12	299-W23-129	A7965	6	130	02/01/62	F
41-06-02	299-W23-142	A7978	6	100	03/02/72	F
41-06-05	299-W23-143	A7979	6	140	03/21/72	F
41-06-06	299-W23-226	A8053	6	130	04/18/78	F
41-06-09	299-W23-144	A7980	6	100	03/24/72	F
41-06-11	299-W23-058	A7894	8	101	09/13/54	E
41-06-23	299-W23-227	A8054	6	130	05/02/78	F
41-07-02	299-W23-074	A7910	6	75	02/19/62	F
41-07-03	299-W23-075	A7911	6	75	02/20/62	F
41-07-05	299-W23-076	A7912	6	63	02/19/62	F
41-07-07	299-W23-077	A7913	6	75	02/20/62	F
41-07-08	299-W23-078	A7914	6	75	02/22/62	F
41-07-10	299-W23-079	A7915	6	75	02/23/62	F
41-07-12	299-W23-073	A7909	4*6	90	02/15/62	G1
41-08-02	299-W23-102	A7938	8	75	03/16/62	F1
41-08-03	299-W23-103	A7939	6	75	03/16/62	F
41-08-04	299-W23-098	A7934	6	75	03/14/62	F
41-08-06	299-W23-099	A7935	6	135	03/12/62	F
41-08-07	299-W23-100	A7936	6	75	03/16/62	F
41-08-11	299-W23-101	A7937	6	75	03/15/62	F
41-09-02	299-W23-110	A7946	6	75	03/23/62	F
41-09-03	299-W23-104	A7940	6	75	03/19/62	F
41-09-04	299-W23-105	A7941	6	105	03/21/62	F
41-09-06	299-W23-106	A7942	6	75	03/20/62	F
41-09-07	299-W23-107	A7943	6	75	03/22/62	F
41-09-09	299-W23-108	A7944	6	130	03/22/62	F
41-09-11	299-W23-109	A7945	6	75	03/23/62	F
41-10-01	299-W23-080	A7916	6	135	02/23/62	F
41-10-02	299-W23-066	A7902	8	126	03/01/56	F1

241 - SX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
41-10-03	299-W23-081	A7917	6	75	02/23/62	F
41-10-05	299-W23-082	A7918	6	75	02/26/62	F
41-10-06	299-W23-083	A7919	6	75	02/27/62	F
41-10-08	299-W23-084	A7920	6	75	02/27/62	F
41-10-10	299-W23-067	A7903	8	126	03/16/56	F1
41-10-11	299-W23-085	A7921	6	75	03/01/62	F
41-11-02	299-W23-096	A7932	6	75	03/14/62	F
41-11-03	299-W23-097	A7933	6	75	03/15/62	F
41-11-05	299-W23-092	A7928	6	135	03/08/62	F
41-11-06	299-W23-093	A7929	6	75	03/08/62	F
41-11-08	299-W23-094	A7930	8	135	03/09/62	F1
41-11-09	299-W23-095	A7931	6	75	03/12/62	F
41-11-10	299-W23-064	A7900	8	125	03/07/56	F1
41-12-01	299-W23-233	B2827	7*12	126	08/12/96	F
41-12-02	299-W23-111	A7947	6	125	03/26/62	F
41-12-03	299-W23-112	A7948	6	75	03/26/62	F
41-12-04	299-W23-068	A7904	8	125	03/10/56	F1
41-12-06	299-W23-113	A7949	6	75	03/27/62	F
41-12-07	299-W23-114	A7950	6	75	04/04/62	F
41-12-09	299-W23-115	A7951	6	75	03/27/62	F
41-12-10	299-W23-116	A7952	6	75	03/29/62	F
41-13-10	299-W23-072	A7908	6	100	10/06/58	F
41-14-02	299-W23-091	A7927	6	75	03/09/62	F
41-14-03	299-W23-086	A7922	6	75	03/01/62	F
41-14-04	299-W23-069	A7905	8	125	03/20/56	F1
41-14-06	299-W23-087	A7923	6	75	03/02/62	F
41-14-08	299-W23-088	A7924	6	60	03/02/62	F
41-14-09	299-W23-089	A7925	6	75	03/06/62	F
41-14-11	299-W23-090	A7926	6	75	03/06/62	F
41-15-02	299-W23-117	A7953	6	75	03/29/62	F
41-15-03	299-W23-118	A7954	6	75	04/02/62	F
41-15-05	299-W23-119	A7955	6	75	03/30/62	F
41-15-07	299-W23-070	A7906	8	125	03/27/56	F1
41-15-09	299-W23-120	A7956	6	75	04/03/62	F
41-15-10	299-W23-121	A7957	6	125	04/03/62	F
Total Monitoring Wells =		**94**	**Length =**	**9,265**		
Total Farm Wells		**104**	**Length =**	**10,998**		

241 - T - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
PRIORITY 1 FOR DECOMMISSIONING						
	299-W10-003	A4897	6*8	239	9/26/47	B
50-00-01	299-W10-008	A4899	6	251	06/25/73	B
50-00-02	299-W11-023	A4905	6	252	07/15/73	B
Total Type B Wells =		**3**	**Length =**	**742**		
PRIORITY 1 FOR DECOMMISSIONING						
216-T-7	299-W10-059	A7149	8	150	07/21/47	D
216-T-7	299-W10-060	A7150	8	150	07/22/47	D
216-T-7	299-W10-061	A7151	8	150	07/22/47	D
216-T-7	299-W10-062	A7152	8	150	07/30/47	F1
216-T-7	299-W10-063	A7153	8	150	07/17/47	F1
216-T-7	299-W10-066	A7156	8	125	07/15/47	D
216-T-7	299-W10-067	A7157	8	150	08/01/47	F1
216-T-7	299-W10-068	A7158	8	150	07/30/47	F1
216-T-7	299-W10-069	A7159	8	150	08/01/47	F1
216-T-7	299-W10-073	A7163	8	75	09/22/47	F1
216-T-7	299-W10-074	A7164	8	49	10/14/47	F1
216-T-7	299-W10-077	A7167	8	23	12/01/48	F1
216-T-7	299-W10-080	A7170	8	115	09/27/51	F1
216-T-7	299-W10-081	A7171	8	23	11/01/51	F1
216-T-32	299-W10-056	A7146	8	150	06/17/47	F1
216-T-32	299-W10-057	A7147	8	148	06/16/47	F1
216-T-32	299-W10-058	A7148	8	150	07/03/47	F1
216-T-32	299-W10-064	A7154	8	75	07/11/47	F1
216-T-32	299-W10-065	A7155	8	75	08/13/47	F1
216-T-32	299-W10-075	A7165	8	75	10/08/47	F1
216-T-32	299-W10-076	A7166	8	75	10/24/47	F1
Total # Crib Wells =		**21**	**Length =**	**2,358**		
PRIORITY 2 FOR DECOMMISSIONING						
50-00-06	299-W10-055	A7145	5*12/6	150	09/29/44	A
50-00-08	299-W10-052	A7142	12/10/6	150	10/06/44	A
50-00-10	299-W10-054	A7144	12/10/6	150	10/14/44	A
50-00-12	299-W10-053	A7143	12/10/6	151	10/11/44	A
50-00-09	299-W10-168	A7251	4	122	02/15/77	F
Total # Outlying Wells =		**5**	**Length =**	**723**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
50-00-03	299-W11-051	A7291	12/10/6	148	09/13/44	A

241 - T - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
50-00-05	299-W11-053	A7294	12/10/6	150	09/21/44	A
50-01-02	299-W10-101	A7191	4*6	94	07/27/73	G1
50-01-04	299-W10-102	A7192	4*6	123	08/01/73	G1
50-01-06	299-W10-103	A7193	4*6	94	08/07/73	G1
50-01-09	299-W10-104	A7194	4*6	96	08/31/73	G1
50-01-12	299-W10-105	A7195	4*6	92	07/31/73	G1
50-02-02	299-W10-122	A7212	4*6	91	02/26/74	G1
50-02-05	299-W10-123	A7213	4*6	91	03/06/74	G1
50-02-08	299-W10-116	A7206	4*6	87	07/17/73	G1
50-02-09	299-W10-119	A7209	4*6	91	08/02/73	G1
50-02-10	299-W10-124	A7214	4*6	91	03/01/74	G1
50-02-12	299-W10-125	A7215	4*6	92	02/25/74	G1
50-03-01	299-W10-126	A7216	4*6	92	02/22/74	G1
50-03-04	299-W10-118	A7208	4*6	123	07/30/73	G1
50-03-05	299-W10-117	A7207	4*6	123	08/09/73	G1
50-03-06	299-W10-145	A7235	4*6	125	01/15/75	G1
50-03-08	299-W10-127	A7217	4*6	91	02/20/74	G1
50-03-10	299-W10-128	A7218	4*6	93	02/14/74	G1
50-04-03	299-W10-146	A7236	4*6	92	02/14/75	G1
50-04-05	299-W10-129	A7219	4*6	94	03/06/74	G1
50-04-07	299-W10-147	A7237	4*6	100	02/03/75	G1
50-04-08	299-W10-148	A7238	4*6	100	01/22/75	G1
50-04-10	299-W10-130	A7220	4*6	93	03/07/74	G1
50-05-06	299-W10-113	A7203	4*6	122	07/20/73	G1
50-05-07	299-W10-165	A7248	10/8/6	91	08/08/75	A1
50-05-11	299-W10-121	A7211	4*6	123	08/16/73	G1
50-06-02	299-W10-108	A7198	4*6	125	07/07/73	G1
50-06-03	299-W10-107	A7197	4*6	122	06/27/73	G1
50-06-04	299-W10-110	A7200	6	93	7/191973	F
50-06-05	299-W10-111	A7201	4*6	122	08/23/73	G1
50-06-06	299-W10-106	A7196	4*6	123	07/03/73	G1
50-06-08	299-W10-109	A7199	4*6	123	07/10/73	G1
50-06-11	299-W10-115	A7205	4*6	87	07/13/73	G1
50-06-16	299-W10-167	A7250	10/8/6	94	07/10/75	A1
50-06-17	299-W10-162	A7246	10/6	91	07/10/75	F
50-06-18	299-W10-196	A7274	10/8/6	176	04/13/93	A1
50-07-03	299-W10-149	A7239	4*6	92	03/10/75	G1
50-07-07	299-W10-142	A7232	4*6	94	03/14/74	G1
50-07-08	299-W10-150	A7240	4*6	94	02/25/75	G1
50-08-05	299-W10-143	A7233	4*6	94	03/18/74	G1
50-08-07	299-W10-133	A7223	4*6	120	02/28/74	G1

241 - T - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
50-08-08	299-W10-176	A7255	6	103	04/25/78	F
50-08-09	299-W10-112	A7202	4*6	121	07/15/73	G1
50-08-11	299-W10-051	A7141	6	150	10/05/44	F
50-08-19	299-W10-178	A7257	6	95	08/02/79	F
50-09-01	299-W10-164	A7247	6	150	09/30/75	F
50-09-02	299-W10-166	A7249	8*6	122	06/30/75	F
50-09-05	299-W10-134	A7224	4*6	94	03/13/74	G1
50-09-07	299-W10-144	A7234	4*6	94	03/15/74	G1
50-09-09	299-W10-120	A7210	4*6	121	05/05/77	G1
50-09-10	299-W10-114	A7204	4*6	121	07/25/73	G1
50-10-05	299-W10-135	A7225	4*6	95	02/19/74	G1
50-10-07	299-W10-136	A7226	4*6	94	02/14/74	G1
50-10-08	299-W10-151	A7241	4*6	93	03/04/75	G1
50-10-10	299-W10-137	A7227	4*6	94	02/21/74	G1
50-11-05	299-W10-138	A7228	4*6	93	02/12/74	G1
50-11-07	299-W10-152	A7242	4*6	94	02/27/75	G1
50-11-08	299-W10-139	A7229	4*6	94	02/25/74	G1
50-11-10	299-W10-153	A7243	4*6	100	01/08/75	G1
50-11-11	299-W10-177	A7256	8*6	92	07/26/79	F
50-12-05	299-W10-154	A7244	4*6	100	01/02/75	G1
50-12-07	299-W10-140	A7230	4*6	94	03/05/74	G1
50-12-10	299-W10-141	A7231	4*6	121	03/01/74	G1
Total Monitoring Wells =		**64**	**Length =**	**6,787**		
Total Farm Wells		**93**	**Length =**	**10,610**		

241 - TX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
WELLS CURRENTLY DECOMMISSIONED						
NA	299-W15-151	A7450	NA	25	02/06/73	1
Total Decommissioned Wells =		**1**	**Length =**	**25**		
PRIORITY 2 FOR DECOMMISSIONING						
51-00-03	299-W15-067	A7368	8	150	01/27/49	D
51-00-05	299-W15-070	A7371	8	150	01/31/49	D
51-00-06	299-W15-069	A7370	8	150	02/09/49	D
51-00-07	299-W15-073	A7374	8	150	03/04/49	D
51-00-09	299-W15-074	A7375	8	150	03/03/49	D
51-00-10	299-W15-075	A7376	8	150	03/04/49	D
Total Outlying Wells =		**6**	**Length =**	**900**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
51-01-02	299-W15-166	A7464	6	112	01/22/74	F
51-01-04	299-W15-167	A7465	6	115	12/21/73	F
51-01-06	299-W15-168	A7466	6	100	04/19/74	F
51-01-08	299-W15-169	A7467	6	100	04/18/74	F
51-01-09	299-W15-155	A7453	6	43	12/18/73	F
51-02-02	299-W15-170	A7468	6	100	04/23/74	F
51-02-05	299-W15-143	A7442	6	100	07/21/71	F
51-02-07	299-W15-172	A7470	6	100	04/16/74	F
51-02-09	299-W15-142	A7441	6	100	07/08/71	F
51-02-12	299-W15-141	A7440	6	100	07/16/71	F
51-03-01	299-W15-192	A4923	6	105	06/01/77	F
51-03-02	299-W15-071	A7372	8	150	02/08/49	D
51-03-06	299-W15-127	A7426	6	100	11/10/71	F
51-03-09	299-W15-128	A7427	6	100	11/08/71	F
51-03-11	299-W15-191	A7489	6*8	105	05/27/71	F
51-03-12	299-W15-126	A7425	6	100	11/02/71	F
51-04-02	299-W15-153	A7451	6	105	04/05/76	F
51-04-05	299-W15-130	A7429	6	100	11/12/71	F
51-04-06	299-W15-154	A7452	6*8	105	04/05/76	F
51-04-08	299-W15-131	A7430	6	100	11/12/71	F
51-04-10	299-W15-156	A7454	6*8	105	04/13/76	F
51-04-12	299-W15-129	A7428	6	100	11/23/71	F
51-05-01	299-W15-173	A7471	6	100	03/29/74	F
51-05-03	299-W15-174	A7472	6	115	01/28/74	F
51-05-05	299-W15-145	A7444	6	100	06/14/71	F
51-05-07	299-W15-171	A7469	6	111	01/17/74	F
51-05-08	299-W15-146	A7445	6	100	06/17/71	F

241 - TX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
51-05-10	299-W15-144	A7443	6	100	06/23/71	F
51-06-02	299-W15-148	A7447	6	100	06/25/71	F
51-06-04	299-W15-149	A7448	6	100	07/14/71	F
51-06-08	299-W15-175	A7473	6	100	04/11/74	F
51-06-10	299-W15-147	A7446	6	100	07/01/71	F
51-06-12	299-W15-158	A7456	6*8	100	04/01/76	F
51-07-01	299-W15-178	A7476	6	110	01/23/74	F
51-07-03	299-W15-187	A7484	6	105	05/29/76	F
51-07-04	299-W15-133	A7432	6	100	12/01/71	F
51-07-06	299-W15-193	A7491	6	55	07/01/77	F
51-07-07	299-W15-190	A7488	6	105	05/16/77	F
51-07-09	299-W15-134	A7433	6	100	11/18/71	F
51-07-11	299-W15-132	A7431	6	100	11/29/71	F
51-07-18	299-W15-195	A7493	6	105	07/01/77	F
51-08-05	299-W15-136	A7435	6	101	11/16/71	F
51-08-09	299-W15-137	A7436	6	100	11/16/71	F
51-08-11	299-W15-135	A7434	6	100	11/18/71	F
51-09-03	299-W15-139	A7438	6	100	10/27/71	F
51-09-04	299-W15-188	A7485	6	105	04/13/76	F
51-09-08	299-W15-140	A7439	6	100	10/22/71	F
51-09-10	299-W15-189	A7486	6	105	04/01/76	F
51-09-12	299-W15-138	A7437	6	85	10/18/71	F
51-10-01	299-W15-176	A7474	6	100	04/10/74	F
51-10-04	299-W15-103	A7402	6	100	09/15/70	F
51-10-08	299-W15-104	A7403	6	100	09/24/70	F
51-10-12	299-W15-105	A7404	6	100	09/01/70	F
51-10-13	299-W15-196	A7494	6	105	09/22/77	F
51-10-25	299-W15-197	A7495	6	108	03/28/78	F
51-11-01	299-W15-177	A7475	6	113	04/24/74	F
51-11-02	299-W15-072	A7373	8	150	02/08/49	C1
51-11-03	299-W15-106	A7405	6	100	10/02/70	F
51-11-07	299-W15-107	A7406	6	100	09/25/70	F
51-11-10	299-W15-108	A7407	6	100	10/02/70	F
51-12-01	299-W15-159	A7457	6	100	11/20/73	F
51-12-04	299-W15-109	A7408	6	100	09/22/70	F
51-12-05	299-W15-179	A7477	6	100	04/26/74	F
51-12-07	299-W15-110	A7409	6	100	10/02/70	F
51-12-10	299-W15-180	A7478	6	100	04/30/74	F
51-12-11	299-W15-111	A7410	6	100	09/25/70	F
51-13-05	299-W15-112	A7411	6	100	10/13/70	F
51-13-08	299-W15-113	A7412	6	100	09/16/70	F

241 - TX - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
51-13-12	299-W15-114	A7413	6	100	10/09/70	F
51-14-04	299-W15-115	A7414	6	100	09/14/70	F
51-14-08	299-W15-116	A7415	6	100	09/22/70	F
51-14-11	299-W15-117	A7416	6	100	09/17/70	F
51-15-04	299-W15-118	A7417	6	100	03/09/70	F
51-15-07	299-W15-119	A7418	6	95	03/03/70	F
51-15-09	299-W15-160	A7458	6	100	12/04/73	F
51-15-11	299-W15-120	A7419	6	100	03/11/70	F
51-16-04	299-W15-161	A7459	6	100	11/29/73	F
51-16-07	299-W15-163	A7461	6	100	12/04/73	F
51-16-11	299-W15-162	A7460	6	100	11/21/73	F
51-17-02	299-W15-121	A7420	6	100	10/15/70	F
51-17-03	299-W15-068	A7369	8	150	01/28/49	F1
51-17-10	299-W15-122	A7421	6	100	10/07/70	F
51-17-11	299-W15-164	A7462	6	100	10/30/73	F
51-18-01	299-W15-181	A7479	6	100	04/29/74	F
51-18-03	299-W15-123	A7422	6	100	10/20/70	F
51-18-05	299-W15-182	A7480	6	100	04/30/74	F
51-18-07	299-W15-124	A7423	6	100	09/08/70	F
51-18-09	299-W15-183	A7481	6	100	04/08/74	F
51-18-10	299-W15-125	A7424	5	100	11/02/70	F
51-18-11	299-W15-165	A7463	6	100	11/16/73	F
NA	299-W15-194	A7492	6*8	48	07/07/77	F
Total Monitoring Wells =		**91**	**Length =**	**9,216**		
Total Farm Wells		**98**	**Length =**	**10,141**		

241 - TY - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
WELLS CURRENTLY DECOMMISSIONED						
NA	299-W15-096	A7395	6	72	01/01/61	I
NA	299-W15-097	A7396	2	70	01/01/61	I
NA	299-W15-098	A7397	2	70	01/01/61	I
NA	299-W15-099	A7398	2	70	01/01/61	I
NA	299-W15-100	A7399	2	70	01/01/61	I
NA	299-W15-759	B2759	2	70	01/01/61	I
NA	299-W15-760	B2760	2	70	01/01/61	I
NA	299-W15-761	B2761	2	70	01/01/61	I
Total Decommissioned Wells =		**8**	**Length =**	**562**		
PRIORITY 1 FOR DECOMMISSIONING						
52-06-07	299-W15-003	A4928	6*8	236	09/10/73	B1
NA	299-W15-013	A4918	6	225	09/05/73	B1
Total Type B1 Wells =		**2**	**Length =**	**461**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
52-01-01	299-W10-088	A7178	6	100	12/10/71	F
52-01-05	299-W10-089	A7179	6	100	12/08/71	F
52-01-09	299-W10-090	A7180	6	100	12/17/71	F
52-02-01	299-W10-091	A7181	6	100	11/23/71	F
52-02-05	299-W10-092	A7182	6	100	12/17/71	F
52-02-06	299-W10-171	A7254	6	100	08/31/47	F
52-02-09	299-W10-093	A7183	6	100	12/14/71	F
52-02-11	299-W10-161	A7245	6	100	5/15/75, 7/9/77	F
52-03-03	299-W10-095	A7185	6	100	12/01/71	F
52-03-06	299-W10-096	A7186	6	100	12/06/71	F
52-03-12	299-W10-094	A7184	6	100	11/29/71	F
52-04-02	299-W10-097	A7187	6	100	12/14/71	F
52-04-03	299-W10-083	A7173	6	150	06/19/52	D
52-04-06	299-W10-098	A7188	6	100	12/07/71	F
52-04-09	299-W10-099	A7189	6	100	12/10/71	E
52-04-10	299-W10-082	A7172	6	150	08/15/52	D
52-05-07	299-W15-186	A7484	6	100	08/08/74	F
52-06-02	299-W10-100	A7190	6	66	NA	F
52-06-04	299-W15-185	A7483	6	100	08/12/74	F
52-06-05	299-W15-079	A7380	8	150	09/25/52	D
52-06-06	299-W15-184	A7482	6	100	08/14/74	F
Total Monitoring Wells =		**21**	**Length =**	**2,216**		
Total Farm Wells		**31**	**Length =**	**3,239**		

241 - U - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
WELLS CURRENTLY DECOMMISSIONED						
NA	299-W18-111	A7594	NA	NA	NA	1
Total Decommissioned Wells =		**1**	**Length =**	**0**		
PRIORITY 2 FOR DECOMMISSIONING						
60-00-06	299-W18-051	A7534	12/10	150	10/24/44	C1
60-00-08	299-W18-055	A7538	12/10	150	11/10/44	C1
60-00-10	299-W18-053	A7536	12/10	150	11/11/44	C1
60-00-11	299-W18-052	A7535	12/10	150	11/07/44	C1
Total Outlying Wells =		**4**	**Length =**	**600**		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
60-00-02	299-W19-054	A7753	12/10	153	11/30/44	C1
60-00-05	299-W19-053	A7752	12/10	148	10/30/44	C1
60-01-08	299-W18-135	A7618	6	125	04/24/74	F
60-01-10	299-W18-136	A7619	6	100	03/26/75	F
60-02-01	299-W18-137	A7620	6	125	04/13/74	F
60-02-05	299-W18-138	A7621	6	100	05/14/75	F
60-02-07	299-W18-139	A7622	6	125	03/21/74	F
60-02-08	299-W18-140	A7623	6	105	02/20/76	F
60-02-10	299-W18-141	A7624	6	125	08/21/74	F
60-02-11	299-W18-142	A7625	6	100	03/17/75	F
60-03-01	299-W18-143	A7626	6	100	03/13/75	F
60-03-05	299-W18-144	A7627	6	125	04/01/74	F
60-03-08	299-W18-145	A7628	6	125	05/02/74	F
60-03-10	299-W18-146	A7629	6	100	11/01/75	F
60-03-11	299-W18-147	A7630	6	125	08/28/74	F
60-04-03	299-W19-076	A7776	6	125	08/07/74	F
60-04-08	299-W18-124	A7607	6	120	02/01/74	F
60-04-10	299-W18-125	A7608	6	120	02/12/74	F
60-04-12	299-W18-126	A7609	6	125	03/28/74	F
60-05-04	299-W18-176	A7658	6	76	08/29/78	F
60-05-05	299-W18-127	A7610	6	125	05/30/74	F
60-05-07	299-W18-128	A7611	6	125	05/21/74	F
60-05-08	299-W18-129	A7612	6	125	04/05/74	F
60-05-10	299-W18-130	A7613	6	100	05/07/74	F
60-06-07	299-W18-131	A7614	6	125	07/26/74	F
60-06-08	299-W18-132	A7615	6	100	05/01/75	F
60-06-10	299-W18-133	A7616	6	125	04/19/74	F
60-06-11	299-W18-134	A7617	6*8	105	02/03/76	F

241 - U - FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
60-07-01	299-W18-114	A7597	6	105	01/28/76	F
60-07-02	299-W19-074	A7774	6	125	08/13/74	F
60-07-10	299-W18-116	A7599	6	105	01/28/76	F
60-07-11	299-W18-117	A7600	6	125	04/26/74	F
60-08-04	299-W18-115	A7598	6	125	03/13/74	F
60-08-08	299-W18-118	A7601	6	105	01/27/76	F
60-08-09	299-W18-119	A7602	6	125	05/14/74	F
60-08-10	299-W18-054	A7537	12/10	150	10/30/44	F
60-09-01	299-W18-120	A7603	6	100	02/10/76	F
60-09-07	299-W18-121	A7604	6	105	02/12/76	F
60-09-08	299-W18-122	A7605	6	120	02/05/74	F
60-09-10	299-W18-123	A7606	6	125	07/11/74	F
60-10-01	299-W18-100	A7583	6	125	09/05/74	F
60-10-02	299-W19-075	A7775	6	105	02/17/76	F
60-10-05	299-W18-104	A7587	6	125	06/25/74	F
60-10-07	299-W18-148	A7631	6	120	02/08/74	F
60-10-11	299-W18-107	A7590	6	105	01/21/76	F
60-11-03	299-W18-102	A7585	6	125	07/13/73	F
60-11-05	299-W18-109	A7592	6	125	05/11/74	F
60-11-06	299-W18-101	A7584	6	125	07/13/73	F
60-11-07	299-W18-110	A7593	6	125	05/22/74	F
60-11-12	299-W18-105	A7588	6	125	06/26/73	F
60-12-01	299-W18-113	A7596	6	125	07/11/74	F
60-12-03	299-W18-103	A7586	6	125	06/15/73	F
60-12-05	299-W18-092	A7575	6	100	06/19/70	F
60-12-07	299-W18-090	A7573	6	100	06/24/70	F
60-12-10	299-W18-091	A7574	6	100	06/17/70	F
Total Monitoring Wells =		**55**	**Length =**	**6,447**		
Total Farm Wells =		**60**	**Length =**	**7,047**		

APPENDIX C

TABLES

VADOSE ZONE WELLS

SOIL SAMPLING AND PITT

(PRIORITY 3 WELLS)

241 - A - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
10-01-01	299-E25-097	A6532	F	0-15
10-01-03	299-E25-091	A6530	F	0-20, 60-80
10-01-04	299-E25-092	A6531	F	0-15, 35-70
10-01-06	299-E24-070	A5925	F	0-15, 25-30, 45-60
10-01-08	299-E24-071	A5926	F	0-10
10-01-09	NA	B8052	F	0-5
10-01-10	299-E24-072	A5927	F	0-15
10-01-11	299-E24-073	A5928	F	0-15
10-01-16	299-E25-170	A6585	G	0-15, 20-50
10-01-28	299-E25-204	A6608	F	0-15, 20-45
10-01-39	299-E25-192	A6598	F	0-15, 20-45
10-02-01	299-E25-090	A6529	F	0-20, 75-80, 115
10-02-03	299-E25-083	A6522	F	0-15, 70-125
10-02-05	299-E25-085	A6524	F	0-15, 75-85, 110-125
10-02-06	299-E25-086	A6525	F	0-15
10-02-08	299-E25-087	A6526	F	0-15,80-90
10-02-10	299-E25-088	A6527	F	0-15
10-02-11	299-E25-089	A6528	F	0-20
10-03-01	299-E25-078	A6517	F	0-15
10-03-02	299-E25-079	A6518	F	0-15
10-03-04	299-E25-080	A6519	F	0-17, 78-87
10-03-05	299-E25-081	A6520	F	0-20, 78-97
10-03-07	299-E25-082	A6521	F	0-18, 78-87
10-03-10	299-E25-055	A6044	F1	0-5
10-03-11	299-E25-084	A6523	F	0-50
10-04-01	299-E25-061	A6500	F	0-5
10-04-04	299-E25-056	A6045	F1	0-5 btm
10-04-05	299-E25-063	A6502	F	0-15
NA	299-E24-065	NA	F1	0-20, 40-80
10-04-07	299-E24-066	A5921	F	0-5
10-04-08	299-E24-067	A5922	F1	0-15
10-04-10	299-E24-068	A5923	G	0-5
10-04-12	299-E24-069	A5924	F	0-9
10-05-02	299-E25-068	A6507	G	0-15, 90 btm
10-05-05	299-E25-070	A6509	F	0-5, 50
10-05-07	299-E25-071	A6510	F	0-5, 55-75

241 - A - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
10-05-08	299-E25-098	A6533	F	0-15
10-05-09	299-E25-062	A6501	F	0-15, 50-75
10-05-10	299-E25-066	A6505	F	0-5, 60-70
10-05-12	299-E25-067	A6506	F	0-15, 50-btm
10-06-02	299-E25-074	A6513	F	0-10
10-06-04	299-E25-075	A6514	F	0-15, 15-25
10-06-05	299-E25-076	A6515	F	0-15
10-06-07	299-E25-077	A6516	F	0-20, 115, btm
10-06-09	299-E25-069	A6508	F	0-20
10-06-10	299-E25-072	A6511	F	0-10, 20 btm
10-06-12	299-E25-073	A6512	G	0-20
NA	299-E25-051	A6040	F1	-
Total Monitoring Wells =		**48**		

241 - AX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
11-01-01	299-E25-099	A6534	F	0-5, 15-20
11-01-02	299-E25-100	A6535	F	0-5
11-01-04	299-E25-101	A6537	F	0-5, 10-15, 55
11-01-05	299-E25-102	A6538	F	0-10
11-01-07	299-E25-103	A6539	F	0-10
11-01-09	299-E25-104	A6540	F	0-70
11-01-11	299-E25-105	A6541	F	0-5
11-02-02	299-E25-106	A6542	F	0-15, 30-55
11-02-04	299-E25-107	A6543	F	0-100
11-02-05	299-E25-108	A6544	F	0-100
11-02-07	299-E25-109	A6545	F	0-100
11-02-10	299-E25-111	A6547	F	0-15
11-02-11	299-E25-112	A6548	F	0-100
11-03-02	299-E25-113	A6549	F	0-85
11-03-05	299-E25-114	A6550	F	0-5
11-03-07	299-E25-115	A6551	F	0-10, 60-65
11-03-09	299-E25-116	A6552	F	0-5, 45-55
11-03-10	299-E25-117	A6553	F	0-15
11-03-12	299-E25-118	A6554	F	0-5, 10-15
11-04-01	299-E25-119	A6555	F	0-15
11-04-05	299-E25-120	A6556	F	0-105
11-04-07	299-E25-121	A6557	F	0-5
11-04-08	299-E25-122	A6558	F	0-5
11-04-10	299-E25-123	A6559	F	0-20
11-04-11	299-E25-124	A6560	F	0-25
11-02-22	299-E25-127	A6561	F	0-30
11-02-12	299-E25-128	B2899	F	0-50
11-02-23	299-E25-128	A6562	F	-
11-01-10	299-E25-131	B2896	F	0-15
11-02-01	299-E25-132	A6563	F	0-5, 50-70
11-02-03	299-E25-133	B2898	F	0-10
11-04-19	299-E25-147	A6565	F	0-25
Total Monitoring Wells =		**32**		

241 - B- FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
20-01-01	299-E33-261	A7068	F	5-10, 40-45, 55-65
20-01-03	299-E33-220	A7027	F	0-5
20-01-05	299-E33-262	A7069	F	0-10
20-01-06	299-E33-274	A7074	F	0-5, 25-35, 50-55
20-01-07	299-E33-263	A7070	F	0-25
20-01-11	299-E33-264	A7071	F	0-10
20-02-03	299-E33-179	A6987	F	0-25, 80-100
20-02-05	299-E33-180	A6988	F	0-15
20-02-07	299-E33-181	A6989	F	0-20
20-02-09	299-E33-182	A6990	F	0-15, 20-30, 75-95
20-02-11	299-E33-183	A6991	F	0-30, 95-100
20-03-02	299-E33-184	A6992	F	0-10
20-03-03	299-E33-185	A6993	F	0-15
20-03-06	299-E33-186	A6994	F	0-10, 15-20
20-03-09	299-E33-187	A6995	F	0-10
20-03-11	299-E33-188	A6996	F	0-10
20-04-03	299-E33-219	A7026	F	0-20
20-04-06	299-E33-221	A7028	F	0-5
20-05-06	299-E33-218	A7025	F	45-115
20-06-02	299-E33-189	A6997	F	0-10
20-06-03	299-E33-190	A6998	F	0-50, Bottom
20-06-06	299-E33-191	A6999	F	0-15, 55-100
20-06-11	299-E33-192	A7000	F	0-40
20-07-02	299-E33-212	A7019	F	35-60, 75-90
20-07-05	299-E33-149	A6957	F	-
20-07-08	299-E33-148	A6956	F	-
20-07-11	299-E33-147	A6955	F	-
20-08-02	299-E33-054	A6862	C	-
20-08-03	299-E33-193	A7001	F	-
20-08-05	299-E33-194	A7002	F	-
20-08-07	299-E33-195	A7003	F	-
20-08-09	299-E33-196	A7004	F	-
20-09-02	299-E33-197	A7005	F	0-5, 10-15, 20-30
20-09-06	299-E33-198	A7006	F	0-15, 75-80, 85-90
20-09-11	299-E33-200	A7008	F	0-20, 70-80
20-10-02	299-E33-213	A7020	F	-

241 - B- FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
20-10-07	299-E33-216	A7023	F	-
20-10-09	299-E33-215	A7022	F	-
20-10-12	299-E33-214	A7021	F	0-25, 110-120
20-10-24	299-E33-273	A7073	F	-
20-11-09	299-E33-217	A7024	F	0-5, 35-40
20-12-02	299-E33-201	A7009	F	-
20-12-03	299-E33-199	A7007	F	0-20, 65-70, 80-85
20-12-06	299-E33-202	A7010	F	0-20, 100-105
20-12-07	299-E33-203	A7011	F	-
20-12-11	299-E33-204	A7012	F	-
Total Monitoring Wells =		**40**		

241 - BX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
E33-41	299-E33-041	A4867	B	NA
Total Type B1 Wells =		1		
Tank is adjacent to BX farm boundary, is constructed to RCRA standards, and a part of the ground water monitoning program.				
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
21-01-01	299-E33-144	A6952	F	0-40, 75-95
21-01-02	299-E33-135	A6943	F	0-10, 80-90
21-02-01	299-E33-129	A6937	F	0-10
21-02-03	299-E33-145	A6953	F	0-20, 35-40
21-02-04	299-E33-027	A4851	G1	0-5, 10-30, 100-125
21-02-06	299-E33-143	A6951	F	0-5, 40-50
21-02-07	299-E33-130	A6938	F	0-10
21-02-11	299-E33-131	A6939	F	0-10
21-03-03	299-E33-239	A7046	F	0-25
21-03-05	299-E33-229	A7036	F	0-20, 65-70
21-03-07	299-E33-282	A7081	F	0-10
21-03-11	299-E33-275	A7075	F	0-10
21-03-12	299-E33-238	A7045	F	0-30
21-04-01	299-E33-281	A7080	F	0-10, 15-20
21-04-03	299-E33-226	A7033	F	0-20
21-04-04	299-E33-278	A7077	F	0-20
21-04-06	299-E33-224	A7031	F	0-35
21-04-08	299-E33-279	A7078	F	0-10
21-04-11	299-E33-280	A7079	F	0-15
21-05-02	299-E33-158	A6966	F	0-50
21-05-03	299-E33-159	A6967	F	0-20
21-05-05	299-E33-160	A6968	F	0-10, 15-25
21-05-06	299-E33-161	A6969	F	0-10, 15-20, 25-100
21-05-10	299-E33-162	A6970	F	0-30
21-05-12	299-E33-157	A6965	F	0-10
21-06-01	299-E33-163	A6971	F	0-5
21-06-02	299-E33-164	A6972	F	0-30
21-06-05	299-E33-165	A6973	F	0-20, 25-55
21-06-10	299-E33-166	A6974	F	-
21-07-03	299-E33-225	A7032	F	0-20

241 - BX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
21-07-06	299-E33-222	A7029	F	0-25, 35-40, 55-60, 75-100
21-08-02	299-E33-064	A6872	D	0-10
21-08-04	299-E33-234	A7041	F	0-5, 10-25
21-08-05	299-E33-235	A7042	F	0-30, 55-65
21-08-06	299-E33-151	A6959	F	0-20
21-08-07	299-E33-152	A6960	F	0-10, 30-40
21-08-10	299-E33-236	A7043	F	0-40
21-08-12	299-E33-150	A6958	F	0-10, 50-70
21-09-02	299-E33-257	A7064	F	0-30
21-09-04	299-E33-233	A7040	F	0-30
21-09-08	299-E33-258	A7065	F	0-15
21-09-12	299-E33-231	A7038	F	0-35
21-10-01	299-E33-167	A6975	F	0-30, 40-50
21-10-03	299-E33-223	A7030	F	5-40, 45-50, 80-85
21-10-05	299-E33-168	A6976	F	0-20, 35-100
21-10-07	299-E33-169	A6977	F	0-55
21-10-11	299-E33-170	A6978	F	0-10, 15-25
21-11-03	299-E33-237	A7044	F	0-35, 40-100
21-11-04	299-E33-173	A6981	F	0-10, 35-45
21-11-05	299-E33-171	A6979	F	0-10, 40-65
21-11-07	299-E33-172	A6980	F	0-5, 35-45
21-11-10	299-E33-174	A6982	F	0-5
21-11-11	299-E33-175	A6983	F	0-5
21-12-02	299-E33-153	A6961	F	0-20
21-12-05	299-E33-154	A6962	F	0-5
21-12-07	299-E33-155	A6963	F	0-5
21-12-10	299-E33-156	A6964	F	0-20
21-12-12	299-E33-232	A7039	F	0-25
NA	299-E33-277	A7076	F	-
NA	299-E33-228	A7035	F	-
NA	299-E33-227	A7034	F	-
Total Monitoring Wells =		**61**		
Total Farm Wells =		**62**		

241 - BY - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
22-00-01	299-E33-085	A6893	D	0-10, 40-60, 75-95
22-00-02	299-E33-240	A7047	F	0-20
22-00-03	299-E33-084	A6892	D	0-10, 40-150
22-00-04	299-E33-241	A7048	F	-
22-00-05	299-E33-083	A6891	D	-
22-00-10	299-E33-088	A6896	D	0-5, 45-65, 90-95
22-01-01	299-E33-176	A6984	F	0-20
22-01-03	299-E33-245	A7052	F	0-10, 15-20
22-01-04	299-E33-177	A6985	F	0-30
22-01-07	299-E33-178	A6986	F	0-5, 10-30
22-01-10	299-E33-246	A7053	F	0-40, 45-100
22-02-01	299-E33-101	A6909	F	0-10, 40-55
22-02-02	299-E33-227	A7034	F	0-15, 20-30
22-02-05	299-E33-228	A7035	F	0-15, 20-25
22-02-09	299-E33-102	A6910	F	0-20
22-03-01	299-E33-104	A6912	F	0-10
22-03-04	299-E33-211	A7018	F	0-25
22-03-05	299-E33-103	A6911	F	0-20, 50-100
22-03-06	299-E33-210	A7017	F	0-25, 40-50
22-03-07	299-E33-242	A7049	F	0-10, 15-25
22-03-08	299-E33-244	A7051	F	0-10, 15-25
22-03-09	299-E33-105	A6913	F	0-30, 70-100
22-03-10	299-E33-243	A7050	F	0-50
22-04-01	299-E33-106	A6914	F	0-100
22-04-05	299-E33-107	A6915	F	0-35
22-04-07	299-E33-248	A7055	F	0-35
22-04-09	299-E33-108	A6916	F	0-10, 20-40, 90-125
22-04-11	299-E33-249	A7056	F	0-5, 10-45, 100
22-05-01	299-E33-109	A6917	F	0-10, 30-40
22-05-05	299-E33-110	A6918	F	0-30, 60-95
22-05-09	299-E33-111	A6919	F	0-10, 20-40, 95-100
22-06-01	299-E33-112	A6920	F	0-10, 15-30, 40-60, 95-100
22-06-05	299-E33-113	A6921	F	0-5, 35-50, 65-85
22-06-07	299-E33-086	A6894	D	0-10, 15-20, 90-100

241 - BY - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
22-06-09	299-E33-114	A6922	F	0-10, 15-20
22-06-11	299-E33-250	A7057	F	0-35
22-07-01	299-E33-115	A6923	F	0-10, 60-70, 75-100
22-07-02	299-E33-206	A7013	F	0-30, 90-100
22-07-05	299-E33-116	A6924	F	0-25, 60-95
22-07-07	299-E33-251	A7058	F	0-10, 25-35
22-07-09	299-E33-117	A6925	F	0-40, 60-100
22-07-10	299-E33-252	A7059	F	0-40, 60-70, 95-100
22-08-01	299-E33-118	A6926	F	0-5, 40-55, 60-70
22-08-02	299-E33-208	A7015	F	5-15, 25-50, 65-100
22-08-05	299-E33-119	A6927	F	0-5, 10-30, 50-85
22-08-06	299-E33-207	A7014	F	0-25, 65-75
22-08-07	299-E33-087	A6895	D	0-5, 40-70
22-08-09	299-E33-120	A6928	F	0-10, 25-40, 95-100
22-08-12	299-E33-209	A7016	F	0-10, 20-30, 45-75
22-09-01	299-E33-123	A6931	F	0-5, 10-25
22-09-02	299-E33-259	A7066	F	0-35
22-09-05	299-E33-122	A6930	F	0-10, 90-100
22-09-07	299-E33-260	A7067	F	0-15, 30-50, 55-70
22-09-08	299-E33-121	A6929	F	0-15, 20-25, 80-90
22-09-11	299-E33-253	A7060	F	0-10, 15-25
22-10-05	299-E33-124	A6932	F	0-15, 50-75, 100
22-10-07	299-E33-254	A7061	F	25-30
22-10-09	299-E33-255	A7062	F	0-10
22-10-10	299-E33-125	A6933	F	0-5, 65-75, 85-95
22-11-01	299-E33-126	A6934	F	0-10, 20-30
22-11-05	299-E33-127	A6935	F	0-10, 15-30, 100
22-11-08	299-E33-256	A6864	C	0-10, 15-30
22-11-09	299-E33-128	A6936	F	0-5, 25-35
22-12-01	299-E33-100	A6908	F	0-30
22-12-03	299-E33-094	A6902	F	0-5, 10-20, 25-40, 100
22-12-05	299-E33-095	A6903	F	0-20, 30-40
22-12-06	299-E33-096	A6904	F	0-15, 20-35
22-12-07	299-E33-097	A6905	F	0-5
22-12-09	299-E33-098	A6906	F	0-15, 100
22-12-10	299-E33-099	A6907	F	0-15, 75-85, 95-100
Total Monitoring Wells =		**70**		

241 - C - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
30-00-01	299-E27-056	A6681	C1	0-70
30-00-06	299-E27-055	A6680	C	0-110
30-00-09	299-E27-057	A6682	C	0-60
30-01-01	299-E27-060	A6685	F	0-10
30-01-06	299-E27-059	A6684	F	0-10, 35-40
30-01-09	299-E27-058	A6683	F	0-5, 25-50
30-01-12	299-E27-061	A6686	F	0-20
30-03-01	299-E27-074	A6699	F	0-30, 50-70
30-03-03	299-E27-075	A6700	F	0-40
30-03-05	299-E27-076	A6701	F	0-30, 55-75
30-03-07	299-E27-077	A6702	F	0-40, 45-60
30-03-09	299-E27-078	A6703	F	0-10, 20-40, 45-60, 80-90
30-04-01	299-E27-115	A6735	F	0-25
30-04-02	299-E27-067	A6692	F	0-30, 40-65
30-04-03	299-E27-116	A6736	F	0-30, 35-50
30-04-04	299-E27-079	A6704	F	0-25, 45-60
30-04-05	299-E27-080	A6705	F	0-30, 45-55
30-04-08	299-E27-066	A6691	F	0-25, 30-40, 45-55
30-04-12	299-E27-065	A6690	F	0-30, 40-55
30-05-02	299-E27-070	A6695	F	0-30, 40-50
30-05-03	299-E27-081	A6706	F	0-35
30-05-04	299-E27-069	A6694	F	0-20, 40-80, 110-120
30-05-05	299-E27-082	A6707	F	0-40, 45-80
30-05-06	299-E27-119	A6739	F	0-30, 40-50
30-05-07	299-E27-118	A6738	F	0-10, 15-35, 45-65
30-05-08	299-E27-117	A6737	F	0-20, 30-50
30-05-09	299-E27-083	A6708	F	0-30, 55-70
30-05-10	299-E27-068	A6693	F	0-10, 130-140
30-06-02	299-E27-072	A6697	F	0-15, 35-50
30-06-03	299-E27-084	A6709	F	0-30, 35-60
30-06-04	299-E27-073	A6698	F	0-30, 35-55
30-06-09	299-E27-085	A6710	F	0-20, 40-50
30-06-10	299-E27-071	A6696	F	0-10, 85-115
30-06-12	299-E27-086	A6711	F	0-30, 50-70
30-07-01	299-E27-087	A6712	F	0-20, 25-35, 40-60

241 - C - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
30-07-02	299-E27-088	A6713	F	0-30
30-07-05	299-E27-089	A6714	F	0-5, 45-65
30-07-07	299-E27-090	A6715	F	0-15, 60-65
30-07-08	299-E27-091	A6716	F	0-30, 50-55
30-07-10	299-E27-092	A6717	F	0-25
30-07-11	299-E27-093	A6718	F	0-25, 50-70, 95-100
30-08-02	299-E27-094	A6719	F	0-25, 50-80
30-08-03	299-E27-051	A6676	C1	0-50
30-08-12	299-E27-095	A6720	F	0-35, 50-75
30-09-01	299-E27-096	A6721	F	0-35, 90-100
30-09-02	299-E27-097	A6722	F	0-15, 45-60
30-09-06	299-E27-098	A6723	F	0-30, 40-70, 75-85
30-09-07	299-E27-135	A6754	F	0-35, 80-90
30-09-10	299-E27-099	A6724	F	0-40, 45-65, 90-100
30-09-11	299-E27-100	A6725	F	0-15, 45-50, 95-100
30-10-01	299-E27-101	A6726	F	0-20
30-10-02	299-E27-102	A6727	F	0-35, 45-65
30-10-09	299-E27-103	A6728	F	0-35
30-10-11	299-E27-104	A6729	F	0-5
30-11-01	299-E27-063	A6688	F	0-30, 35-50
30-11-05	299-E27-105	A6730	F	0-5
30-11-06	299-E27-064	A6689	F	0-10, 15-40
30-11-09	299-E27-062	A6687	F	0-15, 20-40
30-11-11	299-E27-106	A6731	F	0-5
30-12-01	299-E27-107	A6732	F	0-10, 15-20, 45-50
30-12-03	299-E27-108	A6733	F	0-10
30-12-09	299-E27-109	A6734	F	0-10
30-12-13	299-E27-125	A6745	F	0-10, 15-20, 30-50
Total Monitoring Wells =		**63**		

241 - S - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
40-01-01	299-W23-145	A7981	F	0-15
40-01-04	299-W23-179	A8015	F	0-10
40-01-06	299-W23-146	A7982	F	0-40
40-01-08	299-W23-147	A7983	F	0-15
40-01-10	299-W23-180	A8016	F	0-25
40-02-01	299-W23-148	A7984	F	0-5
40-02-03	299-W23-188	A8024	D	0-65
40-02-04	299-W23-052	A7888	F	0-10
40-02-05	299-W23-181	A8017	F	0-30, 90-100
40-02-07	299-W23-149	A7985	F	0-80
40-02-08	299-W23-189	A8025	F	0-55
40-02-10	299-W23-150	A7986	F	0-5
40-02-11	299-W23-182	A8018	F	0-5
40-03-01	299-W23-151	A7987	F	0-5
40-03-03	299-W23-212	A8046	F	0-5
40-03-05	299-W23-053	A7889	D	50-70
40-03-06	299-W23-152	A7988	F	0
40-03-08	299-W23-183	A8019	F	0-10
40-03-09	299-W23-153	A7989	F	0-40, 120-130
40-03-11	299-W23-184	A8020	F	0
40-04-01	299-W23-123	A7959	F	0-5, 15-20, 45-50
40-04-05	299-W23-124	A7960	F	0-40, 50-130
40-04-07	299-W23-122	A7958	F	0-60
40-04-08	299-W23-177	A8013	F	0-50
40-05-03	299-W23-154	A7990	F	0-25
40-05-05	299-W23-054	A7890	D	-
40-05-07	299-W23-155	A7991	F	0-20
40-05-08	299-W23-199	A8035	F	0-5, 10-15
40-05-10	299-W23-156	A7992	F	0
40-06-02	299-W23-157	A1993	F	5-15
40-06-04	299-W23-213	A8047	F	0-5
40-06-05	299-W23-055	A7891	D	0
40-06-06	299-W23-158	A7994	F	55-60
40-06-08	299-W23-201	A8037	F	0
40-06-09	299-W23-159	A7995	F	0-5
40-07-01	299-W23-160	A7996	F	0-25, 40-45
40-07-04	299-W23-185	A8021	F	0-5

241 - S - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
40-07-06	299-W23-161	A7997	F	0-5
40-07-08	299-W23-186	A8022	F	0-10, 25-30
40-07-10	299-W23-162	A7998	F	0-15
40-07-11	299-W23-187	A8023	F	0-40, 50-60
40-08-01	299-W23-178	A8014	F	0-5
40-08-06	299-W23-163	A7999	F	0-5
40-08-08	299-W23-202	A8038	F	0-5
40-08-09	299-W23-164	A8000	F	0
40-08-12	299-W23-216	A8048	F	0-5
40-09-01	299-W23-200	A8036	F	0
40-09-02	299-W23-165	A8001	F	0
40-09-05	299-W23-057	A7893	D	0-5, 50-60
40-09-06	299-W23-166	A8002	F	0
40-09-08	299-W23-203	A8039	F	0
40-09-09	299-W23-167	A8003	F	0-5
40-10-03	299-W23-168	A8004	F	0-15
40-10-05	299-W23-204	A8040	F	0-5
40-10-06	299-W23-169	A8005	F	0-40
40-10-08	299-W23-205	A8041	F	0-20
40-10-09	299-W23-170	A8006	F	90-100
40-10-13	299-W23-218	A8049	F	0-15
40-11-01	299-W23-171	A8007	F	0-5
40-11-05	299-W23-206	A8042	F	0-5
40-11-07	299-W23-172	B2900	F	0-15, 35-45
40-11-08	299-W23-207	A8043	F	0-5
40-11-09	299-W23-173	A8008	F	0
40-12-02	299-W23-174	A8009	F	-
40-12-04	299-W23-220	A8050	F	0-10
40-12-06	299-W23-175	A8010	F	0-15
40-12-07	299-W23-208	A8044	F	0
40-12-09	299-W23-176	A8011	F	0-25
Total Monitoring Wells =		**68**		

241 - SX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
41-01-01	299-W23-132	A7968	F1	0-20
41-01-04	299-W23-190	A8026	F	0-40, 95-100
41-01-06	299-W23-133	A7969	F	0-55, 90-95
41-01-07	299-W23-060	A7896	E	0-100
41-01-08	299-W23-134	A7970	F	0-30, 95-100
41-01-10	299-W23-191	A8027	F	0-25, 35-60
41-01-11	299-W23-192	A8028	F	0-25, 45-55
41-02-02	299-W23-135	A7971	F	0-75, 120-140
41-02-05	299-W23-223	A8051	F	0-40, 60-65, 105-110
41-02-07	299-W23-059	A7895	E	0-90
41-02-08	299-W23-136	A7972	F	0-60, 80-95
41-02-11	299-W23-193	A8029	F	0-60
41-03-02	299-W23-194	A8030	F	0-60
41-03-05	299-W23-195	A8031	F	0-60, 95-100
41-03-06	299-W23-138	A7974	F	0-20
41-03-09	299-W23-139	A7975	F	0-30, 60-80
41-03-10	299-W23-196	A8032	F	0-50, 65-75
41-03-12	299-W23-137	A7973	F	0-70, 130-140
41-04-01	299-W23-140	A7976	F	0-60
41-04-03	299-W23-197	A8033	F	0-25, 95-100
41-04-05	299-W23-198	A8034	F	0-20
41-04-07	299-W23-062	A7898	E	-
41-04-08	299-W23-225	A8052	F	0-5, 115-125
41-04-11	299-W23-141	A7977	F	0-50
41-05-02	299-W23-130	A7966	F	0-60, 80-95, 110-125
41-05-03	299-W23-131	A7967	F	0-70
41-05-05	299-W23-125	A7961	F	0-40, 120-135
41-05-07	299-W23-126	A7962	F	0-40, 60-125
41-05-08	299-W23-127	A7963	F	0-20, 40-70
41-05-10	299-W23-128	A7964	F	0-40, 55-90
41-05-12	299-W23-129	A7965	F	0-25, 35-70
41-06-02	299-W23-142	A7978	F	0-70, 80-100
41-06-05	299-W23-143	A7979	F	0-11, 30-45
41-06-06	299-W23-226	A8053	F	0-15
41-06-09	299-W23-144	A7980	F	0-35

241 - SX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
41-06-11	299-W23-058	A7894	E	0-10, 30-50, 65-95
41-06-23	299-W23-227	A8054	F	0-15
41-07-02	299-W23-074	A7910	F	0-20
41-07-03	299-W23-075	A7911	F	0-20, 40-75
41-07-05	299-W23-076	A7912	F	0-75
41-07-07	299-W23-077	A7913	F	0-75
41-07-08	299-W23-078	A7914	F	0-75
41-07-10	299-W23-079	A7915	F	0-15, 40-70
41-07-12	299-W23-073	A7909	G1	0-10, 60-65
41-08-02	299-W23-102	A7938	F1	0-75
41-08-03	299-W23-103	A7939	F	0-75
41-08-04	299-W23-098	A7934	F	0-77
41-08-06	299-W23-099	A7935	F	0-10, 120-135
41-08-07	299-W23-100	A7936	F	0-60
41-08-11	299-W23-101	A7937	F	0-75
41-09-02	299-W23-110	A7946	F	0-75
41-09-03	299-W23-104	A7940	F	0-60
41-09-04	299-W23-105	A7941	F	0-60
41-09-06	299-W23-106	A7942	F	0-75
41-09-07	299-W23-107	A7943	F	0-65
41-09-09	299-W23-108	A7944	F	0-80, 100-130
41-09-11	299-W23-109	A7945	F	0-75
41-10-01	299-W23-080	A7916	F	0-5, 60-70, 120-135
41-10-02	299-W23-066	A7902	F1	0-5, 120-125
41-10-03	299-W23-081	A7917	F	0-75
41-10-05	299-W23-082	A7918	F	0-20, 40-75
41-10-06	299-W23-083	A7919	F	0-30
41-10-08	299-W23-084	A7920	F	0-20, 45-75
41-10-10	299-W23-067	A7903	F1	0-5, 120-130
41-10-11	299-W23-085	A7921	F	0-20, 50-75
41-11-02	299-W23-096	A7932	F	0-45, 70-75
41-11-03	299-W23-097	A7933	F	0-25
41-11-05	299-W23-092	A7928	F	0-5, 10-25
41-11-06	299-W23-093	A7929	F	0-25, 50-75
41-11-08	299-W23-094	A7930	F1	0-20
41-11-09	299-W23-095	A7931	F	0-10, 60-75
41-11-10	299-W23-064	A7900	F1	0-5, 60-90, 120-125

241 - SX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
41-12-01	299-W23-233	B2827	F	-
41-12-02	299-W23-111	A7947	F	0-68, 105-113
41-12-03	299-W23-112	A7948	F	0-20, 45-75
41-12-04	299-W23-068	A7904	F1	0-5, 50-70, 90-125
41-12-06	299-W23-113	A7949	F	0-75
41-12-07	299-W23-114	A7950	F	0-20, 30-70
41-12-09	299-W23-115	A7951	F	0-25, 45-65
41-12-10	299-W23-116	A7952	F	0-5, 20-25, 65-75
41-13-10	299-W23-072	A7908	F	0-40
41-14-02	299-W23-091	A7927	F	0-75
41-14-03	299-W23-086	A7922	F	0-30, 50-75
41-14-04	299-W23-069	A7905	F1	0-10
41-14-06	299-W23-087	A7923	F	0-80
41-14-08	299-W23-088	A7924	F	0-75
41-14-09	299-W23-089	A7925	F	0-20, 60-75
41-14-11	299-W23-090	A7926	F	0-45, 65-75
41-15-02	299-W23-117	A7953	F	0-10, 65-75
41-15-03	299-W23-118	A7954	F	0-20, 55-60
41-15-05	299-W23-119	A7955	F	0-10, 45, 70
41-15-07	299-W23-070	A7906	F1	20-90
41-15-09	299-W23-120	A7956	F	0-40, 60-75
41-15-10	299-W23-121	A7957	F	0-40, 50-120
Total Monitoring Wells =		**94**		

241 - T - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
50-00-03	299-W11-051	A7291	A1	0-5, 130-140
50-00-05	299-W11-053	A7294	A1	0
50-01-02	299-W10-101	A7191	G1	0-5, 40-50, 80-90
50-01-04	299-W10-102	A7192	G1	0-20, 70-110
50-01-06	299-W10-103	A7193	G1	0-20, 50-90
50-01-09	299-W10-104	A7194	G1	0-10, 15-30, 85-90
50-01-12	299-W10-105	A7195	G1	0-5, 30-50, 80-90
50-02-02	299-W10-122	A7212	G1	0-5, 35-50
50-02-05	299-W10-123	A7213	G1	0-5, 35-45, 60-70
50-02-08	299-W10-116	A7206	G1	0-5, 35-50, 80-85
50-02-09	299-W10-119	A7209	G1	0-5, 25, 35-50, 80-90
50-02-10	299-W10-124	A7214	G1	0-5, 10-25, 35-40, 80-90
50-02-12	299-W10-125	A7215	G1	0-5, 35-45, 80-90
50-03-01	299-W10-126	A7216	G1	0
50-03-04	299-W10-118	A7208	G1	0-5, 40-50, 55-90
50-03-05	299-W10-117	A7207	G1	0-5, 40-60, 75-80
50-03-06	299-W10-145	A7235	G1	0-15, 65-95
50-03-08	299-W10-127	A7217	G1	0-5
50-03-10	299-W10-128	A7218	G1	0
50-04-03	299-W10-146	A7236	G1	0-30, 70-85
50-04-05	299-W10-129	A7219	G1	0-30, 50-80
50-04-07	299-W10-147	A7237	G1	0-40, 55-65, 70-80
50-04-08	299-W10-148	A7238	G1	0-15, 20-25, 65-80
50-04-10	299-W10-130	A7220	G1	0-5, 10-20, 65-85
50-05-06	299-W10-113	A7203	G1	0-35, 65, 85
50-05-07	299-W10-165	A7248	A1	-
50-05-11	299-W10-121	A7211	G1	0-5, 20-50, 55-65, 80-90, 100-120
50-06-02	299-W10-108	A7198	G1	0-10, 15-20, 45-120
50-06-03	299-W10-107	A7197	G1	0-35, 40-60, 75-90, 100-120
50-06-04	299-W10-110	A7200	F	0-32, 42-92
50-06-05	299-W10-111	A7201	G1	8-10, 90-120
50-06-06	299-W10-106	A7196	G1	0-35
50-06-08	299-W10-109	A7199	G1	0-35
50-06-11	299-W10-115	A7205	G1	0-5, 35-40, 75-85
50-06-16	299-W10-167	A7250	A1	0-5, 15-20, 35-70, 80-85
50-06-17	299-W10-162	A7246	F	0-35
50-06-18	299-W10-196	A7274	A1	0-20, 35-120
50-07-03	299-W10-149	A7239	G1	0-15, 35-55, 65-75, 80-90
50-07-07	299-W10-142	A7232	G1	0-10, 40-50, 80-90
50-07-08	299-W10-150	A7240	G1	0-5, 25-55, 75-85
50-08-05	299-W10-143	A7233	G1	0-5, 10-20

241 - T - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
50-08-07	299-W10-133	A7223	G1	0-5, 70-95, 100-110
50-08-08	299-W10-176	A7255	F	0-10, 65-75, 80-90
50-08-09	299-W10-112	A7202	G1	0-10, 65-90
50-08-11	299-W10-051	A7141	F	0-40, 65-90, 95-105
50-08-19	299-W10-178	A7257	F	0-10, 65-95
50-09-01	299-W10-164	A7247	F	0-20, 50-85
50-09-02	299-W10-166	A7249	F	0-35, 65-85
50-09-05	299-W10-134	A7224	G1	0-5, 65-85
50-09-07	299-W10-144	A7234	G1	0-5
50-09-09	299-W10-120	A7210	G1	0-5
50-09-10	299-W10-114	A7204	G1	0-15, 35-45, 50-70, 85-110
50-10-05	299-W10-135	A7225	G1	0-20, 30-55, 20-90
50-10-07	299-W10-136	A7226	G1	0-20, 30-35, 40-60, 80-90
50-10-08	299-W10-151	A7241	G1	0-10, 30-60, 70-90
50-10-10	299-W10-137	A7227	G1	0-10, 25-30, 60-90
50-11-05	299-W10-138	A7228	G1	0-5
50-11-07	299-W10-152	A7242	G1	0-5
50-11-08	299-W10-139	A7229	G1	0-5, 10-15
50-11-10	299-W10-153	A7243	G1	0-5, 65-70
50-11-11	299-W10-177	A7256	F	0-15, 65-75
50-12-05	299-W10-154	A7244	G1	0-10
50-12-07	299-W10-140	A7230	G1	0-25
50-12-10	299-W10-141	A7231	G1	0
Total Monitoring Wells =		**66**		

241 - TX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
51-01-02	299-W15-166	A7464	F	0-35, 50-75
51-01-04	299-W15-167	A7465	F	0-105
51-01-06	299-W15-168	A7466	F	0-50, 70-75, 95-100
51-01-08	299-W15-169	A7467	F	0-40, 95-100
51-01-09	299-W15-155	A7453	F	0-35, 110-165
51-02-02	299-W15-170	A7468	F	0-25, 50-60
51-02-05	299-W15-143	A7442	F	0-10, 95-105
51-02-07	299-W15-172	A7470	F	0-30
51-02-09	299-W15-142	A7441	F	0-35
51-02-12	299-W15-141	A7440	F	0-30
51-03-01	299-W15-192	A4923	F	0-25, 40-75
51-03-02	299-W15-071	A7372	D	0-15, 30-100, 105-130
51-03-06	299-W15-127	A7426	F	0-25, 95-100
51-03-09	299-W15-128	A7427	F	0-35, 50-95
51-03-11	299-W15-191	A7489	F	0-25, 50-85, 90-100
51-03-12	299-W15-126	A7425	F	0-20, 50-95
51-04-02	299-W15-153	A7451	F	0-25, 40-55, 75-80
51-04-05	299-W15-130	A7429	F	0-25, 45-55, 60-80
51-04-06	299-W15-154	A7452	F	0-35, 60-80
51-04-08	299-W15-131	A7430	F	0-25
51-04-10	299-W15-156	A7454	F	0-15
51-04-12	299-W15-129	A7428	F	0-25
51-05-01	299-W15-173	A7471	F	0-55, 95-100
51-05-03	299-W15-174	A7472	F	0-25, 50-75
51-05-05	299-W15-145	A7444	F	0-25, 50-75
51-05-07	299-W15-171	A7469	F	0-50, 60-70
51-05-08	299-W15-146	A7445	F	0-25, 35-40
51-05-10	299-W15-144	A7443	F	0-50, 65-75, 95-100
51-06-02	299-W15-148	A7447	F	0-35, 95-100
51-06-04	299-W15-149	A7448	F	0-30, 95-100
51-06-08	299-W15-175	A7473	F	0-40, 95-100
51-06-10	299-W15-147	A7446	F	0-25, 95-100
51-06-12	299-W15-158	A7456	F	0-20
51-07-01	299-W15-178	A7476	F	0-40, 105-110
51-07-03	299-W15-187	A7484	F	0-15
51-07-04	299-W15-133	A7432	F	0-30
51-07-06	299-W15-193	A7491	F	-

241 - TX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
51-07-07	299-W15-190	A7488	F	0-30, 50-75
51-07-09	299-W15-134	A7433	F	0-15, 65-100
51-07-11	299-W15-132	A7431	F	0-40
51-07-18	299-W15-195	A7493	F	0-20, 50-75
51-08-05	299-W15-136	A7435	F	0-20, 45-50
51-08-09	299-W15-137	A7436	F	0-20
51-08-11	299-W15-135	A7434	F	0-10
51-09-03	299-W15-139	A7438	F	0-30, 85-100
51-09-04	299-W15-188	A7485	F	0-45, 85-100
51-09-08	299-W15-140	A7439	F	0-30, 95-100
51-09-10	299-W15-189	A7486	F	0-40
51-09-12	299-W15-138	A7437	F	0-30, 80-100
51-10-01	299-W15-176	A7474	F	0-40, 95-100
51-10-04	299-W15-103	A7402	F	0-40
51-10-08	299-W15-104	A7403	F	0-40, 95-100
51-10-12	299-W15-105	A7404	F	0-100
51-10-13	299-W15-196	A7494	F	0-25, 90-95
51-10-25	299-W15-197	A7495	F	0-15
51-11-01	299-W15-177	A7475	F	0-20, 100-110
51-11-02	299-W15-072	A7373	C1	0-10, 40-100
51-11-03	299-W15-106	A7405	F	0-40, 80-100
51-11-07	299-W15-107	A7406	F	0-20
51-11-10	299-W15-108	A7407	F	0-25, 30-50, 95-100
51-12-01	299-W15-159	A7457	F	0-25
51-12-04	299-W15-109	A7408	F	0-15
51-12-05	299-W15-179	A7477	F	0-35
51-12-07	299-W15-110	A7409	F	0-95
51-12-10	299-W15-180	A7478	F	0-20
51-12-11	299-W15-111	A7410	F	0-15, 85-95
51-13-05	299-W15-112	A7411	F	0-35, 75-100
51-13-08	299-W15-113	A7412	F	0-60, 70-100
51-13-12	299-W15-114	A7413	F	0-100
51-14-04	299-W15-115	A7414	F	0-98
51-14-08	299-W15-116	A7415	F	0-98
51-14-11	299-W15-117	A7416	F	0-60, 90-100
51-15-04	299-W15-118	A7417	F	0-40, 45-95
51-15-07	299-W15-119	A7418	F	0-40, 70-100
51-15-09	299-W15-160	A7458	F	0-5, 15-25

241 - TX - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
51-15-11	299-W15-120	A7419	F	0-35
51-16-04	299-W15-161	A7459	F	0-50, 90-100
51-16-07	299-W15-163	A7461	F	0-30, 95-105
51-16-11	299-W15-162	A7460	F	0-40, 95-100
51-17-02	299-W15-121	A7420	F	0-100
51-17-03	299-W15-068	A7369	F1	0-110, 135-145
51-17-10	299-W15-122	A7421	F	0-100
51-17-11	299-W15-164	A7462	F	0-50, 95-100
51-18-01	299-W15-181	A7479	F	0-35
51-18-03	299-W15-123	A7422	F	0-80
51-18-05	299-W15-182	A7480	F	0-70, 80-95, 98-100
51-18-07	299-W15-124	A7423	F	0-30
51-18-09	299-W15-183	A7481	F	0-25
51-18-10	299-W15-125	A7424	F	0-20
51-18-11	299-W15-165	A7463	F	0-35
NA	299-W15-194	A7492	F	-
Total Monitoring Wells =		**91**		

241 - TY - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
52-01-01	299-W10-088	A7178	F	0-5
52-01-05	299-W10-089	A7179	F	0-15, 35-45
52-01-09	299-W10-090	A7180	F	0-5, 95-100
52-02-01	299-W10-091	A7181	F	0
52-02-05	299-W10-092	A7182	F	0-5
52-02-06	299-W10-171	A7254	F	0-5
52-02-09	299-W10-093	A7183	F	0
52-02-11	299-W10-161	A7245	F	0-10, 40-55
52-03-03	299-W10-095	A7185	F	0-25, 40-60
52-03-06	299-W10-096	A7186	F	0-15, 55-100
52-03-12	299-W10-094	A7184	F	0-5, 65-90
52-04-02	299-W10-097	A7187	F	0-5
52-04-03	299-W10-083	A7173	D	0-145
52-04-06	299-W10-098	A7188	F	0-15
52-04-09	299-W10-099	A7189	E	0-99
52-04-10	299-W10-082	A7172	D	0-5
52-05-07	299-W15-186	A7484	F	0-10, 15-25, 50-95
52-06-02	299-W10-100	A7190	F	0-65
52-06-04	299-W15-185	A7483	F	0-25, 50-55
52-06-05	299-W15-079	A7380	D	0-5, 50-100, 105-115, 130-150
52-06-06	299-W15-184	A7482	F	0-35
Total Monitoring Wells =		**21**		

241 - U - FARM WELLS

WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL				
60-00-02	299-W19-054	A7753	C1	0-5
60-00-05	299-W19-053	A7752	C1	0-15, 50-80
60-01-08	299-W18-135	A7618	F	0-30
60-01-10	299-W18-136	A7619	F	0-15, 30, 100
60-02-01	299-W18-137	A7620	F	0-15, 30-35
60-02-05	299-W18-138	A7621	F	0-10
60-02-07	299-W18-139	A7622	F	0-15, 110-115
60-02-08	299-W18-140	A7623	F	0-30
60-02-10	299-W18-141	A7624	F	0-15
60-02-11	299-W18-142	A7625	F	0-5, 20
60-03-01	299-W18-143	A7626	F	0-20
60-03-05	299-W18-144	A7627	F	0-25
60-03-08	299-W18-145	A7628	F	0-15
60-03-10	299-W18-146	A7629	F	0-20
60-03-11	299-W18-147	A7630	F	0-15
60-04-03	299-W19-076	A7776	F	0-15
60-04-08	299-W18-124	A7607	F	0-20, 55-80
60-04-10	299-W18-125	A7608	F	0-5, 25-35, 50-70
60-04-12	299-W18-126	A7609	F	0-30
60-05-04	299-W18-176	A7658	F	0-20, 50-75
60-05-05	299-W18-127	A7610	F	0-75, 115-125
60-05-07	299-W18-128	A7611	F	0-15, 110-125
60-05-08	299-W18-129	A7612	F	0-10
60-05-10	299-W18-130	A7613	F	0-10
60-06-07	299-W18-131	A7614	F	0-15, 120-125
60-06-08	299-W18-132	A7615	F	0-20
60-06-10	299-W18-133	A7616	F	0-10, 120-130
60-06-11	299-W18-134	A7617	F	0-10
60-07-01	299-W18-114	A7597	F	0-15, 50-80
60-07-02	299-W19-074	A7774	F	0-30
60-07-10	299-W18-116	A7599	F	0-15, 55-75
60-07-11	299-W18-117	A7600	F	0-25, 40-45, 50-95
60-08-04	299-W18-115	A7598	F	0-20, 25-35, 55-65
60-08-08	299-W18-118	A7601	F	0-30, 35-40
60-08-09	299-W18-119	A7602	F	0-5, 120-125
60-08-10	299-W18-054	A7537	F	0-5, 45-70, 80-110, 135-140
60-09-01	299-W18-120	A7603	F	0-15, 25-35

APPENDIX D

DECISION MATRIX

TANK FARM ALTERNATIVE EVALUATION

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2a Remove Casing	2b Perf. Casing Mech	2c Perf. Casing Jet	2d Remove & Perf. Casing	3 WATERTIGHT MANHOLE
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		IMPACT/WEIGHTED SCORE					
			5	N/A	5/25	2/10	2/10	4/20	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC(4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS 94.2.3)		3	N/A	5/15	3/9	3/9	5/15	2/10
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		3	N/A	5/15	3/9	2/6	3/9	2/6
TANK INTEGRITY (4.4)			5	N/A	5/25	5/25	3/15	5/25	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	1/4	1/4	1/4	1/4	1/4
SCHEDULE (4.6)			3	N/A	4/12	2/6	2/6	4/12	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	0/0	0/0	0/0	0/0	0/0
MAINTAINABILITY (4.8)			2	N/A	1/2	1/2	1/2	1/2	2/4
OPERABILITY (4.9)			2	N/A	1/2	1/2	1/2	1/2	1/2
CONSTRUCTIBILITY (4.10)			3	N/A	4/12	3/9	2/6	5/15	1/3
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	0/0	0/0	0/0	0/0	0/0
TOTAL WEIGHTED SCORE					**112**	**76**	**60**	**107**	**37**

APPENDIX E

COST ESTIMATES

COST SUMMARY TABLES.....II-E-1
ALTERNATIVE 2a: PULL CASING/GROUT HOLE (FILE # SCI1).....II-E-8
ALTERNATIVE 2b: PERFORATE CASING & GROUT (FILE # SCJ1).....II-E-31
ALTERNATIVE 2c: PERFORATE CASING WITH JET
SHOT & GROUT (FILE #SCK1).....II-E-60
ALTERNATIVE 2d: CUT & REMOVE INNER CASING, PERFORATE
OUTER CASTING & GROUT (FILE # SCM1).....II-E-97
ALTERNATIVE 3a; EXTEND CASING AND GROUT PAD (FILE # SCL1).....II-E-132

TABLE II-E-1

ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 1 WELLS FOR DECOMMISSIONING

TANK FARM	NO. OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	Alt. 2a COST TO REMOVE WELL CASING ($ x 1000)	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH. ($ x 1000)	Alt. 2c COST TO PERF CASING W/ JET SHOT ($ x 1000)	Alt. 2d COST TO REMOVE INNER CASING & MECHANICALLY PERFORATE ($ x 1000)
A	4	1351	$1,165	$498	$351	$513
AX	13	1663	$1,435	$615	$484	$581
B	0	0	$0	$0	$0	$0
BX	2	28	$24	$10	$8	$10
BY	1	275	$237	$102	$74	$96
C	0	0	$0	$0	$0	$0
S	3	627	$541	$231	$162	$219
SX	6	1213	$1,046	$447	$330	$423
T	24	3100	$2,674	$1,060	$817	$2,031
TX	0	0	$0	$0	$0	$0
TY	2	461	$398	$171	$127	$162
U	0	0	$0	$0	$0	$0
TOTAL	55	8718	$7,520	$3,174	$2,347	$3465

NOTES:

1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE II-E-4.

2) ACTIVITY DESCRIPTION - COST BASIS

a) Alternative 2b consist of mechanical perforation of the single casing portion of the well length and jet shot perforation of the double casing portion of the well length.

b) Alternative 2c consist of jet shot perforation of the entire length of the well casing.

c) Alternative 2d consist of mechanical perforation of the entire length of the well casing.

TABLE II-E-2

ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 2 WELLS FOR DECOMMISSIONING

TANK FARM	NUMBER OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	Alt. 2a COST TO REMOVE WELL CASING ($ x 1000)	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH. ($ x 1000)	Alt. 2c COST TO PERF CASING W/ JET SHOT ($ x 1000)	Alt. 2d COST TO REM INNER CASING & MECHANICALLY PERFORATE ($ x 1000)
A	2	301	$259	$111	$78	$114
AX	7	92	$80	$34	$27	$32
B	8	915	$789	$325	$245	$373
BX	17	2135	$1,842	$781	$577	$764
BY	0	0	$0	$0	$0	$0
C	7	684	$590	$252	$187	$267
S	2	300	$259	$111	$77	$105
SX	4	355	$306	$131	$97	$124
T	5	723	$624	$247	$190	$474
TX	6	900	$776	$331	$253	$318
TY	0	0	$0	$0	$0	$0
U	4	600	$518	$217	$154	$230
TOTAL	62	7005	$6,043	$2,550	$1,886	$2,784

NOTES:

1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE II-E-4.

2) ACTIVITY DESCRIPTION - COST BASIS

a) Alternative 2b consist of mechanical perforation of the single casing portion of the well length and jet shot perforation of the double casing portion of the well length.

b) Alternative 2c consist of jet shot perforation of the entire length of the well casing.

c) Alternative 2d consist of mechanical perforation of the entire length of the well casing.

TABLE II-E-3

ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 3 WELLS FOR DECOMMISSIONING

TANK FARM	NO. OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	Alt. 2a COST TO REMOVE WELL CASING ($ x 1000)	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH. ($ x 1000)	Alt. 2c COST TO PERF CASING W/ JET SHOT ($ x 1000)	Alt. 2d COST TO REM INNER CASING & MECHANICAL PERFORATE ($ x 1000)	Alt. 3 COST FOR WATERTIGHT MANHOLE ($ x 1000)
A	47	5221	$4,504	$1,923	$1,355	$1,984	$282
AX	32	3182	$2,745	$1,177	$926	$1,112	$213
B	40	4337	$3,742	$1,539	$1,160	$1,767	$240
BX	62	6609	$5,701	$2,419	$1,785	$2,364	$368
BY	70	7376	$6,363	$2,723	$1,985	$2,574	$413
C	63	6645	$5,732	$2,449	$1,818	$2,595	$371
S	68	7544	$6,508	$2,785	$1,945	$2,630	$404
SX	94	9490	$8,187	$3,498	$2,582	$3,307	$557
T	66	6787	$5,855	$2,320	$1,788	$4,447	$386
TX	91	9241	$7,972	$3,399	$2,603	$3,260	$559
TY	21	2778	$2,396	$1,030	$765	$975	$174
U	55	6447	$5,562	$2,335	$1,654	$2,472	$332
TOTAL	709	75657	$65,267	$27,576	$20,368	$30,071	$4,299

NOTES:

1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE II-E-4.

2) ACTIVITY DESCRIPTION - COST BASIS

a) Alternative 2b consist of mechanical perforation of the single casing portion of the well length and jet shot perforation of the double casing portion of the well length.

b) Alternative 2c consist of jet shot perforation of the entire length of the well casing.

c) Alternative 2d consist of mechanical perforation of the entire length of the well casing.

TABLE II-E-4

ORDER OF MAGNITUDE - COST SUMMARY
WELL DECOMMISSIONING OR IMPROVEMENT
UNIT PRICES

TANK FARM	NUMBER OF WELLS	LINEAR FT. OF WELLS	ALT 2a REMOVE WELL CASING AND GROUT	Alt. 2b PERFORATE CASING W/ JET SHOT OR MECHANICALLY & GROUT	Alt. 2c PERFORATE CASING W/ JET SHOT & GROUT	Alt. 2d CUT & REMOVE INNER CASING, MECHANICALLY PERFORATE & GROUT	Alt. 3 WATERTIGHT MANHOLE
			PER LF	PER LF	PER LF	PER LF	PER EA
A	53	6,873	$862.67	$368.38	$259.49	$379.95	$5,982
AX	52	4,936	$862.67	$370.04	$291.05	$349.51	$6,637
B	48	5,252	$862.67	$354.74	$267.45	$407.32	$5,979
BX	81	8,772	$862.67	$366.00	$270.06	$357.73	$5,943
BY	71	7,651	$862.67	$369.18	$269.12	$348.91	$5,898
C	70	7,329	$862.67	$368.61	$273.56	$390.51	$5,896
S	73	8,471	$862.67	$369.18	$257.88	$348.58	$5,935
SX	104	11,058	$862.67	$368.56	$272.07	$348.49	$5,929
T	95	10,610	$862.67	$341.79	$263.39	655.20	$5,853
TX	97	10,141	$862.67	$367.77	$281.63	$352.78	$6,145
TY	23	3,239	$862.67	$370.81	$275.70	$350.98	$8,254
U	59	7,047	$862.67	$362.11	$256.58	$383.46	$6,028
TOTAL	826	91,379	$862.67	$364.09	$269.21	$397.47	$6,064

TABLE II-E-5
DURATION IN CREW WORK SHIFTS
(PRIORITY 1 WELLS)

TANK FARM	NUMBER OF WELLS TO DECOMM.	NUMBER OF WELLS DOUBLE CASING	Alt. 2a DURATION TO REMOVE CASING & GROUT	Alt. 2b DURATION TO PERF CASING W/ JET SHOT OR MECHANICALLY AND GROUT	Alt. 2c DURATION TO PERF CASING W/ JET SHOT AND GROUT	Alt. 2d DURATION TO CUT & REMOVE INNER PIPE, MECH. PERF. & GROUT	Alt. 3 DURATION TO INSTALL WATERTIGHT MANHOLE
SHIFTS PER WELL			6 SHIFTS /WELL	3 SHIFTS /WELL	2 SHIFTS /WELL	6 SHIFTS /WELL	0.5 SHIFT /WELL
A	4	4	24	12	8	24	2
AX	13	0	78	39	26	0	6.5
B	0	0	0	0	0	0	0
BX	2	0	12	6	4	0	1
BY	1	1	6	3	2	6	0.5
C	0	0	0	0	0	0	0
S	3	2	18	9	6	12	1.5
SX	6	3	36	18	12	18	3
T	24	0	144	72	48	0	12
TX	0	0	0	0	0	0	0
TY	2	2	12	6	4	12	1
U	0	0	0	0	0	0	0
TOTAL	55	12	330	165	110	72	27.5

TABLE II-E-6

DURATION IN CREW WORK SHIFTS (PRIORITY 2 WELLS)

TANK FARM	NUMBER OF WELLS TO DECOMM.	NUMBER OF WELLS DOUBLE CASING	Alt..2a DURATION TO REMOVE CASING & GROUT	Alt. 2b DURATION TO PERF CASING W/ JET SHOT OR MECHANICALLY AND GROUT	Alt. 2c DURATION TO PERF CASING W/ JET SHOT AND GROUT	Alt. 2d DURATION TO CUT & REMOVE INNER PIPE, MECH. PERF. & GROUT	Alt. 3 DURATION TO INSTALL WATERTIGHT MANHOLE
SHIFTS PER WELL			6 SHIFTS /WELL	3 SHIFT /WELL	2 SHIFT /WELL	6 SHIFT /WELL	0.5 SHIFT /WELL
A	2	0	12	6	4	0	1
AX	7	0	42	21	14	0	3.5
B	8	6	48	24	16	36	4
BX	17	0	102	51	34	0	8.5
BY	0	0	0	0	0	0	0
C	7	0	42	21	14	0	3.5
S	2	0	12	6	4	0	1
SX	4	3	24	12	8	18	2
T	5	4	30	15	10	24	2.5
TX	6	0	36	18	12	0	3
TY	0	0	0	0	0	0	0
U	4	4	24	12	8	24	2
TOTAL	62	17	372	186	124	102	31

TABLE II-E-7

DURATION IN CREW WORK SHIFTS (PRIORITY 3 WELLS)

TANK FARM	NUMBER OF WELLS TO DECOMM.	NUMBER OF WELLS DOUBLE CASING	Alt. 2a DURATION TO REMOVE CASING & GROUT	Alt. 2b DURATION TO PERF CASING W/ JET SHOT OR MECHANICALLY AND GROUT	Alt. 2c DURATION TO PERF CASING W/ JET SHOT AND GROUT	Alt. 2d DURATION TO CUT & REMOVE INNER PIPE, MECH. PERF. & GROUT	Alt. 3 DURATION TO INSTALL WATERTIGHT MANHOLE
SHIFTS PER WELL			6 SHIFTS /WELL	3 SHIFTS /WELL	2 SHIFTS /WELL	6 SHIFTS /WELL	0.5 SHIFT /WELL
A	47	4	282	141	94	24	23.5
AX	32	0	192	96	64	0	16
B	40	1	240	120	80	6	20
BX	62	1	372	186	124	6	31
BY	70	1	420	210	140	6	35
C	63	4	378	189	126	24	31.5
S	68	0	408	204	136	0	34
SX	94	1	564	282	188	6	47
T	66	58	396	198	132	348	33
TX	91	1	546	273	182	6	45.5
TY	21	0	126	63	42	0	10.5
U	55	1	330	165	110	6	27.5
TOTAL	709	72	4254	2127	1418	432	354.5

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	6,120,000	30	1,840,000	7,960,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	45,370,000	30	13,610,000	58,980,000
TOTAL ESTIMATED COST (TEC)		51,490,000	30	15,450,000	66,940,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	9,150,000	30	2,740,000	11,890,000
TOTAL OTHER PROJECT COSTS (OPC)		9,150,000	30	2,740,000	11,890,000
TOTAL PROJECT COST (TPC)		60,640,000	30	18,190,000	78,830,000

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	10/12/00	
LEAD ESTIMATOR	DL GUNDERSON	ESTIMATING MANAGER	FC DAY
PROJECT MANAGER			
CLIENT			

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
SUBTOTAL 11	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
310011	A-FARM PULL CASING AND GROUT PIPE	1869526	1363450	3232976	4.99	161325	3394301	30	1018290	4412592
310021	AX-FARM PULL CASING AND GROUT PIPE	1351400	986206	2337606	4.99	116646	2454253	30	736275	3190529
310031	B-FARM PULL CASING AND GROUT PIPE	1437692	1049179	2486871	4.99	124094	2610966	30	783289	3394255
310041	BX-FARM PULL CASING AND GROUT PIPE	2398924	1750648	4149572	4.99	207063	4356636	30	1306990	5663627
310051	BY-FARM PULL CASING AND GROUT PIPE	2092872	1527309	3620181	4.99	180647	3800828	30	1140248	4941076
310061	C-FARM PULL CASING AND GROUT PIPE	2004941	1463140	3468081	4.99	173057	3641138	30	1092341	4733480
310071	S-FARM PULL CASING AND GROUT PIPE	2316794	1690718	4007512	4.99	199974	4207487	30	1262246	5469733
310081	SX-FARM PULL CASING AND GROUT PIPE	3023176	2206203	5229379	4.99	260946	5490325	30	1647097	7137422
310091	T-FARM PULL CASING AND GROUT PIPE	2900837	2116924	5017761	4.99	250386	5268148	30	1580444	6848592
310101	TX-FARM PULL CASING AND GROUT PIPE	2772832	2023517	4796349	4.99	239337	5035687	30	1510706	6546393
310111	TY-FARM PULL CASING AND GROUT PIPE	888057	648082	1536139	4.99	76653	1612792	30	483837	2096630
310121	U-FARM PULL CASING AND GROUT PIPE	1927935	1406944	3334879	4.99	166410	3501290	30	1050387	4551677
SUBTOTAL 31	CONSTRUCTION FORCES	24984986	18232326	43217312	4.99	2156543	45373855	30	13612156	58986012
500000	OPERATING CONTRACTOR (CHG)	7500000	1214250	8714250	4.99	434841	9149091	30	2744727	11893818
PROJECT TOTAL		37,441,982	20,320,494	57,762,476	4.99	2,882,347	60,644,824	30	18,193,447	78,838,271

1. ESTIMATE PURPOSE

PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS

A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY

A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(2) A FACTOR OF 45.9% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS.
(3) CONSUMABLES ARE ESTIMATED AT 3.5% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 3% HAS BEEN APPLIED TO DIRECT CRAFT LABOR.
(6) A FACTOR OF 10% HAS BEEN APPLIED TO DIRECT CRAFT LABOR AND 0.25% TO ENGINEERING TO ALLOW FOR USAGE OF GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNCORP.

C. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR FEDERAL SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR FEDERAL SERVICES COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMANS COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE AND G&A/FEE TO DEVELOP A FULLY BURDENED RATE BY CRAFT.

D. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND CONSTRUCTION, 17.38%
(2) FDH GFS/G&A - GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEKITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:
A.) ESTIMATE IS BASED ON WORK PERFORMED BY CONSTRUCTION FORCES.

B.) ALL CASING DISPOSED OF AS RAD MIXED WASTE. CUT CASING TO FIT IN WOOD BURIAL BOXES.

C.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
TOTAL 000	ENGINEERING	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
460	IMPROVEMENTS TO LAND									
310011	A-FARM PULL CASING AND GROUT PIPE	1869526	1363450	3232976	4.99	161325	3394301	30	1018290	4412592
310021	AX-FARM PULL CASING AND GROUT PIPE	1351400	986206	2337606	4.99	116646	2454253	30	736275	3190529
310031	B-FARM PULL CASING AND GROUT PIPE	1437692	1049179	2486871	4.99	124094	2610966	30	783289	3394255
310041	BX-FARM PULL CASING AND GROUT PIPE	2398924	1750648	4149572	4.99	207063	4356636	30	1306990	5663627
310051	BY-FARM PULL CASING AND GROUT PIPE	2092872	1527309	3620181	4.99	180647	3800828	30	1140248	4941076
310061	C-FARM PULL CASING AND GROUT PIPE	2004941	1463140	3468081	4.99	173057	3641138	30	1092341	4733480
310071	S-FARM PULL CASING AND GROUT PIPE	2316794	1690718	4007512	4.99	199974	4207487	30	1262246	5469733
310081	SX-FARM PULL CASING AND GROUT PIPE	3023176	2206203	5229379	4.99	260946	5490325	30	1647097	7137422
310091	T-FARM PULL CASING AND GROUT PIPE	2900837	2116924	5017761	4.99	250386	5268148	30	1580444	6848592
310101	TX-FARM PULL CASING AND GROUT PIPE	2772832	2023517	4796349	4.99	239337	5035687	30	1510706	6546393
310111	TY-FARM PULL CASING AND GROUT PIPE	888057	648082	1536139	4.99	76653	1612792	30	483837	2096630
310121	U-FARM PULL CASING AND GROUT PIPE	1927935	1406944	3334879	4.99	166410	3501290	30	1050387	4551677
TOTAL 460	IMPROVEMENTS TO LAND	24984986	18232326	43217312	4.99	2156543	45373855	30	13612156	58986012
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	7500000	1214250	8714250	4.99	434841	9149091	30	2744727	11893818
TOTAL 900	PROJECT SUPPORT	7500000	1214250	8714250	4.99	434841	9149091	30	2744727	11893818
PROJECT TOTAL		37,441,982	20,320,494	57,762,476	4.99	2,882,347	60,644,824	30	18,193,447	78,838,271

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
	TOTAL ENGINEERING		873,918			290,962			1,836,563	
		4,956,996		5,830,914	4.99		6,121,877	30		7,958,440
CONSTRUCTION										
07	SITE IMPROVEMENTS	24984986	18232326	43217312	4.99	2156543	45373855	30	13612156	58986012
99	OTHER COST AND FEES	7500000	1214250	8714250	4.99	434841	9149091	30	2744727	11893818
	TOTAL CONSTRUCTION		19,446,576			2,591,384			16,356,884	
		32,484,986		51,931,562	4.99		54,522,947	30		70,879,831
	PROJECT TOTAL		20,320,494			2,882,347			18,193,447	
		37,441,982		57,762,476	4.99		60,644,824	30		78,838,271

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	2953104	0.00	0	7382	513249	520632
121100	ENGINEERING DURING CONSTRUCTION	2003892	0.00	0	5009	348276	353286
310011	A-FARM PULL CASING AND GROUT PIPE	1869526	45.90	858112	103119	402218	1363450
310021	AX-FARM PULL CASING AND GROUT PIPE	1351400	45.90	620292	74880	291033	986206
310031	B-FARM PULL CASING AND GROUT PIPE	1437692	45.90	659900	79658	309619	1049179
310041	BX-FARM PULL CASING AND GROUT PIPE	2398924	45.90	1101106	132885	516657	1750648
310051	BY-FARM PULL CASING AND GROUT PIPE	2092872	45.90	960628	115941	450739	1527309
310061	C-FARM PULL CASING AND GROUT PIPE	2004941	45.90	920267	111072	431800	1463140
310071	S-FARM PULL CASING AND GROUT PIPE	2316794	45.90	1063408	128340	498969	1690718
310081	SX-FARM PULL CASING AND GROUT PIPE	3023176	45.90	1387637	167452	651112	2206203
310091	T-FARM PULL CASING AND GROUT PIPE	2900837	45.90	1331484	160678	624762	2116924
310101	TX-FARM PULL CASING AND GROUT PIPE	2772832	45.90	1272729	153592	597194	2023517
310111	TY-FARM PULL CASING AND GROUT PIPE	888057	45.90	407618	49226	191238	648082
310121	U-FARM PULL CASING AND GROUT PIPE	1927935	45.90	884922	106808	415214	1406944
500000	OPERATING CONTRACTOR (CHG)	7500000	0.00	0	0	1214250	1214250
PROJECT TOTAL		37,441,982		11,468,108	1,396,047	7,456,337	20,320,494

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCI1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

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BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN HOURS FOR ALL DRILL HOLE DECOMMISSIONING ALTERNATES THE SAME	000	33600 MHR	33600	2953104	0	0	0	0	0	2953104
SUBTOTAL	HOME OFFICE LABOR			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL WBS 111100 DEFINITIVE DESIGN				33,600	2,953,104	0	0	0	0	0	2,953,104

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	E & I DURING CONSTRUCTION	000	22800 MHR	22800	2003892	0	0	0	0	0	2003892
	HOURS FOR ALL DRILL HOLE DECOMMISIONING ALTERNATES THE SAME										
SUBTOTAL	HOME OFFICE LABOR			22,800		0		0		0	
					2,003,892		0		0		2,003,892
TOTAL	COST CODE 00090			22,800		0		0		0	
	WBS 121100 FDNW				2,003,892		0		0		2,003,892
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				22,800		0		0		0	
					2,003,892		0		0		2,003,892

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310011	A-FARM PULL CASING AND GROUT PIPE										
310011.07	SITE IMPROVEMENTS										
310011.0701002	********** 241-A FARM- PULL CASING & GROUT HOLE **********	460	53 EA	0	0	0	0	0	0	0	0
310011.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	881	1000	0	0	0	0	1881
310011.0701006	3 LABORER	460	1 LS	24	768	0	0	0	0	0	768
310011.0701008	1 TEAMSTER **********	460	1 LS	8	315	0	0	0	0	0	315
310011.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	6873 LF	10310	378377	412380	20619	0	0	0	811376
310011.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	6873 LF	10310	324559	0	0	0	0	0	324559
310011.0701106	1 TEAMSTER	460	6873 LF	3437	129403	0	0	0	0	0	129403
310011.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	6873 LF	0	0	0	343650	0	0	0	343650
310011.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	6873 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			24,113	834,303	413,380	364,269	0	0	0	1,611,952
	CONSUMABLES 3.50 %						29200				29200
	GENERAL FOREMAN 3.00 %			723	25029						25029
	GENERAL REQUIREMENTS 20.00 %			4967	171866						171866
	SALES TAX 8.00 %						31477		0		31477
TOTAL	COST CODE 46007			29,803	1,031,198	413,380	424,947	0	0	0	1,869,525
	WBS 310011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310011 A-FARM PULL CASING AND GROUT PIPE				29,803	1,031,198	413,380	424,947	0	0	0	1,869,525

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310021	AX-FARM PULL CASING AND GROUT PIPE										
310021.07	SITE IMPROVEMENTS										
310021.0701002	**********	460	52 EA	0	0	0	0	0	0	0	0
	241-AX FARM- PULL CASING AND GROUT HOLES										
	**********										
310021.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310021.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310021.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310021.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	4936 LF	7404	277872	296160	14808	0	0	0	588840
310021.0701104	3 LABORERS	460	4936 LF	7404	233078	0	0	0	0	0	233078
310021.0701106	1 TEAMSTER	460	4936 LF	2468	92920	0	0	0	0	0	92920
310021.0701108	**********	460	4936 LF	0	0	0	246800	0	0	0	246800
	ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.										
310021.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING	460	4936 LF	0	0	0	0	0	0	0	0
	**********										
SUBTOTAL	SITE IMPROVEMENTS			17,332		297,160		0		0	
					605,828		261,608		0		1,164,596
	CONSUMABLES 3.50 %						21203				21203
	GENERAL FOREMAN 3.00 %			520	18174						18174
	GENERAL REQUIREMENTS 20.00 %			3570	124800						124800
	SALES TAX 8.00 %						22624		0		22624
TOTAL	COST CODE 46007			21,422		297,160		0		0	
	WBS 310021 FDNW				748,803		305,436		0		1,351,400
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021 AX-FARM PULL CASING AND GROUT PIPE				21,422		297,160		0		0	
					748,803		305,436		0		1,351,400

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310031	B-FARM PULL CASING AND GROUT PIPE										
310031.07	SITE IMPROVEMENTS										
310031.0701002	********** 241-B FARM- PULL CASING AND GROUT HOLES **********	460	48 EA	0	0	0	0	0	0	0	0
310031.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310031.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310031.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310031.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	5252 LF	7878	295661	315120	15756	0	0	0	626537
310031.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	5252 LF	7878	247999	0	0	0	0	0	247999
310031.0701106	1 TEAMSTER	460	5252 LF	2626	98869	0	0	0	0	0	98869
310031.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	5252 LF	0	0	0	262600	0	0	0	262600
310031.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	5252 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			18,438		316,120		0		0	
					644,487		278,356		0		1,238,963
	CONSUMABLES 3.50 %						22557				22557
	GENERAL FOREMAN 3.00 %			553	19334						19334
	GENERAL REQUIREMENTS 20.00 %			3798	132764						132764
	SALES TAX 8.00 %						24073		0		24073
TOTAL	COST CODE 46007			22,789		316,120		0		0	
	WBS 310031 FDNW				796,585		324,986		0		1,437,692
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310031 B-FARM PULL CASING AND GROUT PIPE				22,789		316,120		0		0	
					796,585		324,986		0		1,437,692

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BX-FARM PULL CASING AND GROUT PIPE										
310041.07	SITE IMPROVEMENTS										
310041.0701002	********** 241-BX FARM- PULL CASING AND GROUT HOLES **********	460	82 EA	0	0	0	0	0	0	0	0
310041.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310041.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310041.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310041.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	8772 LF	13158	493820	526320	26316	0	0	0	1046456
310041.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	8772 LF	13158	414214	0	0	0	0	0	414214
310041.0701106	1 TEAMSTER	460	8772 LF	4386	165133	0	0	0	0	0	165133
310041.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	8772 LF	0	0	0	438600	0	0	0	438600
310041.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	8772 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			30,758	1,075,125	527,320	464,916	0	0	0	2,067,361
	CONSUMABLES 3.50 %						37629				37629
	GENERAL FOREMAN 3.00 %			923	32253						32253
	GENERAL REQUIREMENTS 20.00 %			6336	221475						221475
	SALES TAX 8.00 %						40203		0		40203
TOTAL	COST CODE 46007 WBS 310041 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			38,016	1,328,854	527,320	542,749	0	0	0	2,398,923
TOTAL WBS 310041 BX-FARM PULL CASING AND GROUT PIPE				38,016	1,328,854	527,320	542,749	0	0	0	2,398,923

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310051	BY-FARM PULL CASING AND GROUT PIPE										
310051.07	SITE IMPROVEMENTS										
310051.0701002	**********	460	71 EA	0	0	0	0	0	0	0	0
	241-BY FARM- PULL CASING AND GROUT HOLES										
	**********										
310051.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310051.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310051.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310051.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	7651 LF	11477	430732	459060	22953	0	0	0	912745
310051.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	7651 LF	11477	361296	0	0	0	0	0	361296
310051.0701106	1 TEAMSTER	460	7651 LF	3826	144049	0	0	0	0	0	144049
310051.0701108	**********	460	7651 LF	0	0	0	382550	0	0	0	382550
	ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.										
310051.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING	460	7651 LF	0	0	0	0	0	0	0	0
	**********										
SUBTOTAL	SITE IMPROVEMENTS			26,836		460,060		0		0	
					938,035		405,503		0		1,803,598
	CONSUMABLES 3.50 %						32831				32831
	GENERAL FOREMAN 3.00 %			805	28141						28141
	GENERAL REQUIREMENTS 20.00 %			5528	193235						193235
	SALES TAX 8.00 %						35066		0		35066
TOTAL	COST CODE 46007			33,169		460,060		0		0	
	WBS 310051 FDNW				1,159,411		473,400		0		2,092,872
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310051 BY-FARM PULL CASING AND GROUT PIPE				33,169		460,060		0		0	
					1,159,411		473,400		0		2,092,872

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310061	C-FARM PULL CASING AND GROUT PIPE										
310061.07	SITE IMPROVEMENTS										
310061.0701002	********** 241-C FARM- PULL CASING AND GROUT HOLES **********	460	70 EA	0	0	0	0	0	0	0	0
310061.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310061.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310061.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310061.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	7329 LF	10994	412605	439740	21987	0	0	0	874332
310061.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	7329 LF	10994	346091	0	0	0	0	0	346091
310061.0701106	1 TEAMSTER	460	7329 LF	3665	137987	0	0	0	0	0	137987
310061.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	7329 LF	0	0	0	366450	0	0	0	366450
310061.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	7329 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			25,709		440,740		0		0	
					898,641		388,437		0		1,227,818
	CONSUMABLES 3.50 %						31452				31452
	GENERAL FOREMAN 3.00 %			771	26959						26959
	GENERAL REQUIREMENTS 20.00 %			5296	185120						185120
	SALES TAX 8.00 %						33591		0		33591
TOTAL	COST CODE 46007			31,776		440,740		0		0	
	WBS 310061 FDNW				1,110,720		453,480		0		2,004,940
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM PULL CASING AND GROUT PIPE				31,776		440,740		0		0	
					1,110,720		453,480		0		2,004,940

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310071	S-FARM PULL CASING AND GROUT PIPE										
310071.07	SITE IMPROVEMENTS										
310071.0701002	********** 241-S FARM- PULL CASING AND GROUT HOLES **********	460	73 EA	0	0	0	0	0	0	0	0
310071.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310071.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310071.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310071.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	8471 LF	12707	476894	508260	25413	0	0	0	1010567
310071.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	8471 LF	12707	400016	0	0	0	0	0	400016
310071.0701106	1 TEAMSTER	460	8471 LF	4236	159485	0	0	0	0	0	159485
310071.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	8471 LF	0	0	0	423550	0	0	0	423550
310071.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	8471 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			29,706		509,260		0		0	
					1,038,353		448,963		0		1,996,576
	CONSUMABLES 3.50 %						36342				36342
	GENERAL FOREMAN 3.00 %			891	31150						31150
	GENERAL REQUIREMENTS 20.00 %			6119	213900						213900
	SALES TAX 8.00 %						38824		0		38824
TOTAL	COST CODE 46007			36,716		509,260		0		0	
	WBS 310071 FDNW				1,283,404		524,129		0		2,316,794
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310071 S-FARM PULL CASING AND GROUT PIPE				36,716		509,260		0		0	
					1,283,404		524,129		0		2,316,794

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	SX-FARM PULL CASING AND GROUT PIPE										
310081.07	SITE IMPROVEMENTS										
310081.0701002	********** 241-SX FARM- PULL CASING AND GROUT HOLES **********	460	105 EA	0	0	0	0	0	0	0	0
310081.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310081.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310081.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310081.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	11058 LF	16587	622510	663480	33174	0	0	0	1319164
310081.0701104	3 LABORERS FROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	11058 LF	16587	522159	0	0	0	0	0	522159
310081.0701106	1 TEAMSTER	460	11058 LF	5529	208167	0	0	0	0	0	208167
310081.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	11058 LF	0	0	0	552900	0	0	0	552900
310081.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	11058 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			38,759	1,354,794	664,480	586,074	0	0	0	2,605,348
	CONSUMABLES 3.50 %						47417				47417
	GENERAL FOREMAN 3.00 %			1163	40643						40643
	GENERAL REQUIREMENTS 20.00 %			7984	279087						279087
	SALES TAX 8.00 %						50679		0		50679
TOTAL	COST CODE 46007			47,906	1,674,525	664,480	684,171	0	0	0	3,023,176
	WBS 310081 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081 SX-FARM PULL CASING AND GROUT PIPE				47,906	1,674,525	664,480	684,171	0	0	0	3,023,176

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310091	T-FARM PULL CASING AND GROUT PIPE										
310091.07	SITE IMPROVEMENTS										
310091.0701002	********** 241-T FARM- PULL CASING AND GROUT HOLES **********	460	95 EA	0	0	0	0	0	0	0	0
310091.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310091.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310091.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310091.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	10610 LF	15915	597290	636600	31830	0	0	0	1265720
310091.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	10610 LF	15915	501004	0	0	0	0	0	501004
310091.0701106	1 TEAMSTER	460	10610 LF	5305	199733	0	0	0	0	0	199733
310091.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	10610 LF	0	0	0	530500	0	0	0	530500
310091.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	10610 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			37,191		637,600		0		0	
					1,299,985		562,330		0		2,499,915
	CONSUMABLES 3.50 %						45499				45499
	GENERAL FOREMAN 3.00 %			1116	38999						38999
	GENERAL REQUIREMENTS 20.00 %			7661	267796						267796
	SALES TAX 8.00 %						48626		0		48626
TOTAL	COST CODE 46007			45,968		637,600		0		0	
	WBS 310091 FDNW				1,606,781		656,455		0		2,900,837
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091 T-FARM PULL CASING AND GROUT PIPE				45,968		637,600		0		0	
					1,606,781		656,455		0		2,900,837

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310101	TX-FARM PULL CASING AND GROUT PIPE										
310101.07	SITE IMPROVEMENTS										
310101.0701002	********** 241-TX FARM- PULL CASING AND GROUT HOLES **********	460	102 EA	0	0	0	0	0	0	0	0
310101.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310101.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310101.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310101.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	10141 LF	15212	570906	608460	30423	0	0	0	1209789
310101.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	10141 LF	15212	478874	0	0	0	0	0	478874
310101.0701106	1 TEAMSTER	460	10141 LF	5071	190923	0	0	0	0	0	190923
310101.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	10141 LF	0	0	0	507050	0	0	0	507050
310101.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	10141 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			35,551		609,460		0		0	
					1,242,661		537,473		0		2,389,594
	CONSUMABLES 3.50 %						43493				43493
	GENERAL FOREMAN 3.00 %			1067	37279						37279
	GENERAL REQUIREMENTS 20.00 %			7324	255988						255988
	SALES TAX 8.00 %						46477		0		46477
TOTAL	COST CODE 46007			43,941		609,460		0		0	
	WBS 310101 FDNW				1,535,928		627,443		0		2,772,832
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310101 TX-FARM PULL CASING AND GROUT PIPE				43,941		609,460		0		0	
					1,535,928		627,443		0		2,772,832

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310111	TY-FARM PULL CASING AND GROUT PIPE										
310111.07	SITE IMPROVEMENTS										
310111.0701002	********** 241-TY FARM- PULL CASING AND GROUT HOLES **********	460	31 EA	0	0	0	0	0	0	0	0
310111.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310111.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310111.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310111.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	3239 LF	4859	182358	194340	9717	0	0	0	386415
310111.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	3239 LF	4859	152961	0	0	0	0	0	152961
310111.0701106	1 TEAMSTER	460	3239 LF	1620	60993	0	0	0	0	0	60993
310111.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	3239 LF	0	0	0	161950	0	0	0	161950
310111.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	3239 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			11,394		195,340		0		0	
					398,270		171,667		0		765,277
	CONSUMABLES 3.50 %						13939				13939
	GENERAL FOREMAN 3.00 %			342	11948						11948
	GENERAL REQUIREMENTS 20.00 %			2347	82043						82043
	SALES TAX 8.00 %						14848		0		14848
TOTAL	COST CODE 46007			14,082		195,340		0		0	
	WBS 310111 FDNW				492,261		200,454		0		888,056
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310111 TY-FARM PULL CASING AND GROUT PIPE				14,082		195,340		0		0	
					492,261		200,454		0		888,056

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM PULL CASING AND GROUT PIPE										
310121.07	SITE IMPROVEMENTS										
310121.0701002	********** 241-U FARM- PULL CASING AND GROUT HOLES **********	460	60 EA	0	0	0	0	0	0	0	0
310121.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310121.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310121.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310121.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF ASSUME GROUT 3 CY/100LF	460	7047 LF	10571	396730	422820	21141	0	0	0	840691
310121.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	7047 LF	10571	332775	0	0	0	0	0	332775
310121.0701106	1 TEAMSTER	460	7047 LF	3524	132679	0	0	0	0	0	132679
310121.0701108	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	7047 LF	0	0	0	352350	0	0	0	352350
310121.0701110	$70/CF DISPOSAL X 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	7047 LF	0	0	0	0	0	0	0	0
SUBTOTAL	SITE IMPROVEMENTS			24,722	864,142	423,820	373,491	0	0	0	1,661,453
	CONSUMABLES 3.50 %						30244				30244
	GENERAL FOREMAN 3.00 %			742	25924						25924
	GENERAL REQUIREMENTS 20.00 %			5093	178013						178013
	SALES TAX 8.00 %						32298		0		32298
TOTAL	COST CODE 46007			30,556		423,820		0		0	
	WBS 310121 FDNW				1,068,079		436,034		0		1,927,934
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121 U-FARM PULL CASING AND GROUT PIPE				30,556		423,820		0		0	
					1,068,079		436,034		0		1,927,934

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COSTS	900	1 LS	0	0	0	0	7500000	0	0	7500000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	7,500,000	0	0	7,500,000
TOTAL	COST CODE 90099			0	0	0	0	7,500,000	0	0	7,500,000
	WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	7,500,000	0	0	7,500,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				452,549	5,494,740			7,500,000			0
					18,793,551		5,653,690			0	37,441.982

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS(PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	6,120,000	30	1,840,000	7,960,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	16,370,000	30	4,910,000	21,280,000
TOTAL ESTIMATED COST (TEC)		22,490,000	30	6,750,000	29,240,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	3,100,000	30	930,000	4,030,000
TOTAL OTHER PROJECT COSTS (OPC)		3,100,000	30	930,000	4,030,000
TOTAL PROJECT COST (TPC)		25,590,000	30	7,680,000	33,270,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/12/00

LEAD ESTIMATOR: DL GUNDERSON ESTIMATING MANAGER: FC DAY

PROJECT MANAGER

CLIENT

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
SUBTOTAL 11	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
310011	A-FARM PERF CASING AND GROUT PIPE	661663	496917	1158580	4.99	57813	1216393	30	364918	1581311
310021	AX-FARM PERF CASING AND GROUT PIPE	489051	367224	856275	4.99	42728	899003	30	269701	1168704
310031	B-FARM PERF CASING AND GROUT PIPE	468102	351429	819531	4.99	40894	860426	30	258127	1118553
310041	BX-FARM PERF CASING AND GROUT PIPE	854200	641445	1495645	4.99	74632	1570278	30	471083	2041361
310051	BY-FARM PERF CASING AND GROUT PIPE	756101	567784	1323885	4.99	66061	1389947	30	416984	1806932
310061	C-FARM PERF CASING AND GROUT PIPE	692611	519976	1212587	4.99	60508	1273095	30	381928	1655024
310071	S-FARM PERF CASING AND GROUT PIPE	836736	628342	1465078	4.99	73107	1538185	30	461455	1999641
310081	SX-FARM PERF CASING AND GROUT PIPE	1091246	819487	1910733	4.99	95345	2006079	30	601823	2607903
310091	T-FARM PERF CASING AND GROUT PIPE	737686	553592	1291278	4.99	64434	1355712	30	406713	1762426
310101	TX-FARM PERF CASING AND GROUT PIPE	993912	746380	1740292	4.99	86840	1827133	30	548140	2375273
310111	TY-FARM PERF CASING AND GROUT PIPE	322076	241819	563895	4.99	28138	592033	30	177610	769643
310121	U-FARM PERF CASING AND GROUT PIPE	660884	496231	1157115	4.99	57740	1214856	30	364456	1579312
SUBTOTAL 31	CONSTRUCTION FORCES	8564268	6430632	14994900	4.99	748245	15743146	30	4722943	20466090
320011	A-FARM PERF CASING W/JET PACK	16000	11210	27210	4.99	1357	28568	30	8570	37139
320031	B-FARM PERF CASING W/JET PACK	31500	22071	53571	4.99	2673	56244	30	16873	73117
320041	BX-FARM PERF CASING W/JET PACK	5000	3503	8503	4.99	424	8927	30	2678	11606
320061	C-FARM PERF CASING W/JET PACK	31500	22071	53571	4.99	2673	56244	30	16873	73117
320091	T-FARM PERF CASING W/JET PACK	240000	168161	408161	4.99	20367	428529	30	128558	557087
320101	TX-FARM PERF CASING W/JET PACK	4500	3153	7653	4.99	381	8034	30	2410	10445
320121	U-FARM PERF CASING W/JET PACK	22500	15765	38265	4.99	1909	40174	30	12052	52226
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	351000	245936	596936	4.99	29787	626723	30	188017	814740
500000	OPERATING CONTRACTOR (CHG)	2670000	432273	3102273	0.00	0	3102273	30	930681	4032954
PROJECT TOTAL			7,982,760			1,068,995			7,678,206	
		16,542,264		24,525,024	4.36		25,594,020	30		33,272,226

1. ESTIMATE PURPOSE

PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS

A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY

A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(2) A FACTOR OF 45.9% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS.
(3) CONSUMABLES ARE ESTIMATED AT 3.5% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 3% HAS BEEN APPLIED TO DIRECT CRAFT LABOR.
(6) A FACTOR OF 10% HAS BEEN APPLIED TO DIRECT CRAFT LABOR AND 0.25% TO ENGINEERING TO ALLOW FOR USAGE OF GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNCORP.
(7) CONTRACT ADMINISTRATION FACTOR OF 45.9% HAS BEEN APPLIED TO THE DIRECT SUBCONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR FEDERAL SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR FEDERAL SERVICES COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMANS COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE AND G&A/FEE TO DEVELOP A FULLY BURDENED RATE BY CRAFT.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR. 17.38%
(2) FDH GFS/G&A - GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO CONSTRUCTION MANAGEMENT AND ADMINISTRATION. 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
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MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY CONSTRUCTION FORCES EXCEPT CASINGS WITH DOUBLE CASING ASSUME PERFORATIONS ARE INSTALLED BY SUBCONTRACTOR USING JET PACKS.

B.) SUBCONTRACT RATE SUPPLIED BY FFS PROJECT MANAGER.

C.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
TOTAL 000	ENGINEERING	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
460	IMPROVEMENTS TO LAND									
310011	A-FARM PERF CASING AND GROUT PIPE	661663	496917	1158580	4.99	57813	1216393	30	364918	1581311
310021	AX-FARM PERF CASING AND GROUT PIPE	489051	367224	856275	4.99	42728	899003	30	269701	1168704
310031	B-FARM PERF CASING AND GROUT PIPE	468102	351429	819531	4.99	40894	860426	30	258127	1118553
310041	BX-FARM PERF CASING AND GROUT PIPE	854200	641445	1495645	4.99	74632	1570278	30	471083	2041361
310051	BY-FARM PERF CASING AND GROUT PIPE	756101	567784	1323885	4.99	66061	1389947	30	416984	1806932
310061	C-FARM PERF CASING AND GROUT PIPE	692611	519976	1212587	4.99	60508	1273095	30	381928	1655024
310071	S-FARM PERF CASING AND GROUT PIPE	836736	628342	1465078	4.99	73107	1538185	30	461455	1999641
310081	SX-FARM PERF CASING AND GROUT PIPE	1091246	819487	1910733	4.99	95345	2006079	30	601823	2607903
310091	T-FARM PERF CASING AND GROUT PIPE	737686	553592	1291278	4.99	64434	1355712	30	406713	1762426
310101	TX-FARM PERF CASING AND GROUT PIPE	993912	746380	1740292	4.99	86840	1827133	30	548140	2375273
310111	TY-FARM PERF CASING AND GROUT PIPE	322076	241819	563895	4.99	28138	592033	30	177610	769643
310121	U-FARM PERF CASING AND GROUT PIPE	660884	496231	1157115	4.99	57740	1214856	30	364456	1579312
320011	A-FARM PERF CASING W/JET PACK	16000	11210	27210	4.99	1357	28568	30	8570	37139
320031	B-FARM PERF CASING W/JET PACK	31500	22071	53571	4.99	2673	56244	30	16873	73117
320041	BX-FARM PERF CASING W/JET PACK	5000	3503	8503	4.99	424	8927	30	2678	11606
320061	C-FARM PERF CASING W/JET PACK	31500	22071	53571	4.99	2673	56244	30	16873	73117
320091	T-FARM PERF CASING W/JET PACK	240000	168161	408161	4.99	20367	428529	30	128558	557087
320101	TX-FARM PERF CASING W/JET PACK	4500	3153	7653	4.99	381	8034	30	2410	10445
320121	U-FARM PERF CASING W/JET PACK	22500	15765	38265	4.99	1909	40174	30	12052	52226
TOTAL 460	IMPROVEMENTS TO LAND	8915268	6676569	15591837	4.99	778032	16369870	30	4910961	21280831
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	2670000	432273	3102273	0.00	0	3102273	30	930681	4032954
TOTAL 900	PROJECT SUPPORT	2670000	432273	3102273	0.00	0	3102273	30	930681	4032954
PROJECT TOTAL		16,542,264	7,982,760	24,525,024	4.36	1,068,995	25,594,020	30	7,678,206	33,272,226

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
	ENGINEERING									
90	*HOME OFFICE LABOR*	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
	TOTAL ENGINEERING		873,918			290.962			1,836,563	
		4,956,996		5,830,914	4.99		6,121,877	30		7,958,440
	CONSTRUCTION									
07	SITE IMPROVEMENTS	8915268	6676569	15591837	4.99	778032	16369870	30	4910961	21280831
99	OTHER COST AND FEES	2670000	432273	3102273	0.00	0	3102273	30	930681	4032954
	TOTAL CONSTRUCTION		7,108,842			778,032			5,841,642	
		11,585,268		18,694,110	4.16		19,472,143	30		25,313,785
	PROJECT TOTAL		7,982,760			1,068,995			7,678,206	
		16,542,264		24,525,024	4.36		25,594,020	30		33,272,226

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCJ1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS(PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

DATE 10/12/00 12:27:42
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	2953104	0.00	0	7382	513249	520632
121100	ENGINEERING DURING CONSTRUCTION	2003892	0.00	0	5009	348276	353286
310011	A-FARM PERF CASING AND GROUT PIPE	661663	45.90	303703	48795	144418	496917
310021	AX-FARM PERF CASING AND GROUT PIPE	489051	45.90	224474	36070	106679	367224
310031	B-FARM PERF CASING AND GROUT PIPE	468102	45.90	214858	34407	102163	351429
310041	BX-FARM PERF CASING AND GROUT PIPE	854200	45.90	392077	62986	186381	641445
310051	BY-FARM PERF CASING AND GROUT PIPE	756101	45.90	347050	55775	164959	567784
310061	C-FARM PERF CASING AND GROUT PIPE	692611	45.90	317908	50950	151117	519976
310071	S-FARM PERF CASING AND GROUT PIPE	836736	45.90	384061	61724	182555	628342
310081	SX-FARM PERF CASING AND GROUT PIPE	1091246	45.90	500881	80505	238100	819487
310091	T-FARM PERF CASING AND GROUT PIPE	737686	45.90	338597	53719	161274	553592
310101	TX-FARM PERF CASING AND GROUT PIPE	993912	45.90	456205	73307	216867	746380
310111	TY-FARM PERF CASING AND GROUT PIPE	322076	45.90	147832	23748	70237	241819
310121	U-FARM PERF CASING AND GROUT PIPE	660884	45.90	303345	48668	144217	496231
320011	A-FARM PERF CASING W/JET PACK	16000	45.90	7344	0	3866	11210
320031	B-FARM PERF CASING W/JET PACK	31500	45.90	14458	0	7612	22071
320041	BX-FARM PERF CASING W/JET PACK	5000	45.90	2295	0	1208	3503
320061	C-FARM PERF CASING W/JET PACK	31500	45.90	14458	0	7612	22071
320091	T-FARM PERF CASING W/JET PACK	240000	45.90	110160	0	58001	168161
320101	TX-FARM PERF CASING W/JET PACK	4500	45.90	2065	0	1087	3153
320121	U-FARM PERF CASING W/JET PACK	22500	45.90	10327	0	5437	15765
500000	OPERATING CONTRACTOR (CHG)	2670000	0.00	0	0	432273	432273
	PROJECT TOTAL	16,542,264		4,092,108	643,054	3,247,598	7,982,760

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN HOURS FOR ALL DRILL HOLE DECOMMISSIONING ALTERNATES THE SAME	000	33600 MHR	33600	2953104	0	0	0	0	0	2953104
SUBTOTAL	HOME OFFICE LABOR			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL WBS 111100 DEFINITIVE DESIGN				33,600	2,953,104	0	0	0	0	0	2,953,104

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310011	A-FARM PERF CASING AND GROUT PIPE										
310011.07	SITE IMPROVEMENTS										
310011.0701002	**********	460	49 EA	0	0	0	0	0	0	0	0
	241-A FARM- PERF CASING MECHANICALLY & GROUT										
	**********										
310011.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	881	1000	0	0	0	0	1881
310011.0701006	3 LABORER	460	1 LS	24	768	0	0	0	0	0	768
310011.0701008	1 TEAMSTER	460	1 LS	8	315	0	0	0	0	0	315
	**********										
310011.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	6469 LF	4658	170949	129380	21348	0	0	0	321677
310011.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6469 LF	4658	148963	0	0	0	0	0	148963
310011.0701106	1 TEAMSTER	460	6469 LF	1553	61064	0	0	0	0	0	61064
310011.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	404 LF	145	5322	4040	1212	0	0	0	10574
310011.0701204	3 LABORERS	460	404 LF	145	4637	0	0	0	0	0	4637
310011.0701206	1 TEAMSTER	460	404 LF	48	1887	0	0	0	0	0	1887
SUBTOTAL	SITE IMPROVEMENTS			11,263	394,786	134,420	22,560	0	0	0	551,766
	CONSUMABLES 3.50 %						13817				13817
	GENERAL FOREMAN 3.00 %			338	11843						11843
	GENERAL REQUIREMENTS 20.00 %			2320	81325						81325
	SALES TAX 8.00 %						2910		0		2910
TOTAL	COST CODE 46007			13,921	487,955	134,420	39,287	0	0	0	661,663
	WBS 310011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310011 A-FARM PERF CASING AND GROUT PIPE				13,921	487,955	134,420	39,287	0	0	0	661,663

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310021	AX-FARM PERF CASING AND GROUT PIPE										
310021.07	SITE IMPROVEMENTS										
310021.0701002	**********	460	52 EA	0	0	0	0	0	0	0	0
	241-AX FARM- PERF CASING MECHANICALLY & GROUT HOLES										
	**********										
310021.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310021.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310021.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310021.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	4936 LF	3554	133382	98720	16289	0	0	0	248391
310021.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4936 LF	3554	111880	0	0	0	0	0	111880
310021.0701106	1 TEAMSTER	460	4936 LF	1185	44615	0	0	0	0	0	44615
SUBTOTAL	SITE IMPROVEMENTS			8,349		99,720		0		0	
					291,835		16,289		0		407,844
	CONSUMABLES 3.50 %						10214				10214
	GENERAL FOREMAN 3.00 %			250	8755						8755
	GENERAL REQUIREMENTS 20.00 %			1720	60118						60118
	SALES TAX 8.00 %						2120		0		2120
TOTAL	COST CODE 46007			10,319		99,720		0		0	
	WBS 310021 FDNW				360,708		28,623		0		489,051
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021 AX-FARM PERF CASING AND GROUT PIPE				10,319		99,720		0		0	
					360,708		28,623		0		489,051

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310031	B-FARM PERF CASING AND GROUT PIPE										
310031.07	SITE IMPROVEMENTS										
310031.0701002	**********	460	41 EA	0	0	0	0	0	0	0	0
	241-B FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310031.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310031.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310031.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310031.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	4162 LF	2997	112477	83240	13735	0	0	0	209452
310031.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4162 LF	2997	94346	0	0	0	0	0	94346
310031.0701106	1 TEAMSTER	460	4162 LF	999	37612	0	0	0	0	0	37612
310031.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	1090 LF	392	14712	10900	3270	0	0	0	28882
310031.0701204	3 LABORERS	460	1090 LF	392	12340	0	0	0	0	0	12340
310031.0701206	1 TEAMSTER	460	1090 LF	131	4932	0	0	0	0	0	4932
SUBTOTAL	SITE IMPROVEMENTS			7,964		95,140		0		0	
					278,377		17,005		0		390,522
	CONSUMABLES 3.50 %						9743				9743
	GENERAL FOREMAN 3.00 %			239	8351						8351
	GENERAL REQUIREMENTS 20.00 %			1641	57345						57345
	SALES TAX 8.00 %						2139		0		2139
TOTAL	COST CODE 46007			9,843		95,140		0		0	
	WBS 310031 FDNW				344,073		28,888		0		468,102
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310031 B-FARM PERF CASING AND GROUT PIPE				9,843		95,140		0		0	
					344,073		28,888		0		468,102

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BX-FARM PERF CASING AND GROUT PIPE										
310041.07	SITE IMPROVEMENTS										
310041.0701002	********** 241-BX FARM- PERF CASING MECHANICALLY AND GROUT HOLES **********	460	81 EA	0	0	0	0	0	0	0	0
310041.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310041.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310041.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310041.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	8517 LF	6132	230134	170340	28106	0	0	0	428580
310041.0701104	ASSUME SINGLE CASING 3 LABORERS	460	8517 LF	6132	193035	0	0	0	0	0	193035
310041.0701106	1 TEAMSTER	460	8517 LF	2044	76957	0	0	0	0	0	76957
310041.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	255 LF	92	3453	2550	765	0	0	0	6768
310041.0701204	3 LABORERS	460	255 LF	92	2896	0	0	0	0	0	2896
310041.0701206	1 TEAMSTER	460	255 LF	31	1167	0	0	0	0	0	1167
SUBTOTAL	SITE IMPROVEMENTS			14,579		173,890		0		0	
					509,600		28,871		0		712,361
	CONSUMABLES 3.50 %						17836				17836
	GENERAL FOREMAN 3.00 %			437	15288						15288
	GENERAL REQUIREMENTS 20.00 %			3003	104977						104977
	SALES TAX 8.00 %						3736		0		3736
TOTAL	COST CODE 46007			18,019		173,890		0		0	
	WBS 310041 FDNW				629,865		50,443		0		854,199
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310041 BX-FARM PERF CASING AND GROUT PIPE				18,019		173,890		0		0	
					629,865		50,443		0		854,199

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310051	BY-FARM PERF CASING AND GROUT PIPE										
310051.07	SITE IMPROVEMENTS										
310051.0701002	********** 241-BY FARM- PERF CASING MECHANICALLY AND GROUT HOLES **********	460	71 EA	0	0	0	0	0	0	0	0
310051.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310051.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310051.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310051.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	7651 LF	5509	206753	153020	25248	0	0	0	385021
310051.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7651 LF	5509	173423	0	0	0	0	0	173423
310051.0701106	1 TEAMSTER	460	7651 LF	1836	69125	0	0	0	0	0	69125
SUBTOTAL	SITE IMPROVEMENTS			12,910		154,020		0		0	
					451,259		25,248		0		630,527
	CONSUMABLES 3.50 %						15794				15794
	GENERAL FOREMAN 3.00 %			387	13537						13537
	GENERAL REQUIREMENTS 20.00 %			2659	92959						92959
	SALES TAX 8.00 %						3283		0		3283
TOTAL	COST CODE 46007			15,956		154,020		0		0	
	WBS 310051 FDNW				557,756		44,325		0		756,101
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310051 BY-FARM PERF CASING AND GROUT PIPE				15,956		154,020		0		0	
					557,756		44,325		0		756,101

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310061	C-FARM PERF CASING AND GROUT PIPE										
310061.07	SITE IMPROVEMENTS										
310061.0701002	**********	460	63 EA	0	0	0	0	0	0	0	0
	241-C FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310061.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310061.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310061.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310061.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	6474 LF	4661	174927	129480	21364	0	0	0	325771
310061.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6474 LF	4661	146728	0	0	0	0	0	146728
310061.0701106	1 TEAMSTER	460	6374 LF	1530	57605	0	0	0	0	0	57605
310061.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	1055 LF	380	14261	10550	3165	0	0	0	27976
310061.0701204	3 LABORERS	460	1055 LF	380	11962	0	0	0	0	0	11962
310061.0701206	1 TEAMSTER	460	1055 LF	127	4782	0	0	0	0	0	4782
SUBTOTAL	SITE IMPROVEMENTS			11,795		141,030		0		0	
					412,223		24,529		0		577,782
	CONSUMABLES 3.50 %						14427				14427
	GENERAL FOREMAN 3.00 %			354	12366						12366
	GENERAL REQUIREMENTS 20.00 %			2430	84917						84917
	SALES TAX 8.00 %						3116		0		3116
TOTAL	COST CODE 46007			14,578		141,030		0		0	
	WBS 310061 FDNW				509,507		42,073		0		692,610
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM PERF CASING AND GROUT PIPE				14,578		141,030		0		0	
					509,507		42,073		0		692,610

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310071	S-FARM PERF CASING AND GROUT PIPE										
310071.07	SITE IMPROVEMENTS										
310071.0701002	**********	460	73 EA	0	0	0	0	0	0	0	0
	241-S FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310071.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310071.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310071.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310071.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	8471 LF	6099	228895	169420	27954	0	0	0	426269
310071.0701104	ASSUME SINGLE CASING 3 LABORERS	460	8471 LF	6099	191997	0	0	0	0	0	191997
310071.0701106	1 TEAMSTER	460	8471 LF	2033	76542	0	0	0	0	0	76542
SUBTOTAL	SITE IMPROVEMENTS			14,287	499,392	170,420	27,954	0	0	0	697,766
	CONSUMABLES 3.50 %						17478				17478
	GENERAL FOREMAN 3.00 %			429	14981						14981
	GENERAL REQUIREMENTS 20.00 %			2943	102874						102874
	SALES TAX 8.00 %						3634		0		3634
TOTAL	COST CODE 46007 WBS 310071 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			17,658	617,248	170,420	49,067	0	0	0	836,735
TOTAL WBS 310071 S-FARM PERF CASING AND GROUT PIPE				17,658	617,248	170,420	49,067	0	0	0	836,735

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	*SX-FARM PERF CASING AND GROUT PIPE*										
310081.07	SITE IMPROVEMENTS										
310081.0701002	**********	460	105 EA	0	0	0	0	0	0	0	0
	241-SX FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310081.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310081.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310081.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310081.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	11058 LF	7962	298814	221160	36491	0	0	0	556465
310081.0701104	ASSUME SINGLE CASING 3 LABORERS	460	11058 LF	7962	250644	0	0	0	0	0	250644
310081.0701106	1 TEAMSTER	460	11058 LF	2654	99923	0	0	0	0	0	99923
SUBTOTAL	SITE IMPROVEMENTS			18,634		222,160		0		0	
					651,339		36,491		0		909,990
	CONSUMABLES 3.50 %						22796				22796
	GENERAL FOREMAN 3.00 %			559	19540						19540
	GENERAL REQUIREMENTS 20.00 %			3839	134175						134175
	SALES TAX 8.00 %						4743		0		4743
TOTAL	COST CODE 46007			23,031		222,160		0		0	
	WBS 310081 FDNW				805,055		64,030		0		1,091,245
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081 SX-FARM PERF CASING AND GROUT PIPE				23,031		222,160		0		0	
					805,055		64,030		0		1,091,245

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310091	T-FARM PERF CASING AND GROUT PIPE										
310091.07	SITE IMPROVEMENTS										
310091.0701002	**********	460	35 EA	0	0	0	0	0	0	0	0
	241-T FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310091.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310091.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310091.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310091.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	4125 LF	2970	111464	82500	13613	0	0	0	207577
310091.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4125 LF	2970	93496	0	0	0	0	0	93496
310091.0701106	1 TEAMSTER	460	4125 LF	990	37274	0	0	0	0	0	37274
310091.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	6485 LF	2335	87633	64850	19455	0	0	0	171938
310091.0701204	3 LABORERS	460	6485 LF	2335	73506	0	0	0	0	0	73506
310091.0701206	1 TEAMSTER	460	6485 LF	778	29292	0	0	0	0	0	29292
SUBTOTAL	SITE IMPROVEMENTS			12,434		148,350		0		0	
					434,623		33,068		0		616,041
	CONSUMABLES 3.50 %						15211				15211
	GENERAL FOREMAN 3.00 %			373	13038						13038
	GENERAL REQUIREMENTS 20.00 %			2561	89532						89532
	SALES TAX 8.00 %						3862		0		3862
TOTAL	COST CODE 46007			15,368		148,350		0		0	
	WBS 310091 FDNW				537,194		52,142		0		737,686
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091 T-FARM PERF CASING AND GROUT PIPE				15,368		148,350		0		0	
					537,194		52,142		0		737,686

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310101	TX-FARM PERF CASING AND GROUT PIPE										
310101.07	SITE IMPROVEMENTS										
310101.0701002	********** 241-TX FARM- PERF CASING MECHANICALLY AND GROUT HOLES **********	460	101 EA	0	0	0	0	0	0	0	0
310101.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310101.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310101.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310101.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	9991 LF	7194	269991	199820	32970	0	0	0	502781
310101.0701104	ASSUME SINGLE CASING 3 LABORERS	460	9991 LF	7194	226467	0	0	0	0	0	226467
310101.0701106	1 TEAMSTER	460	9991 LF	2398	90285	0	0	0	0	0	90285
310101.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	150 LF	54	2027	1500	450	0	0	0	3977
310101.0701204	3 LABORERS	460	150 LF	54	1700	0	0	0	0	0	1700
310101.0701206	1 TEAMSTER	460	150 LF	18	678	0	0	0	0	0	678
SUBTOTAL	SITE IMPROVEMENTS			16,968		202,320		0		0	
					593,106		33,420		0		828,846
	CONSUMABLES 3.50 %						20758				20758
	GENERAL FOREMAN 3.00 %			509	17793						17793
	GENERAL REQUIREMENTS 20.00 %			3495	122179						122179
	SALES TAX 8.00 %						4334		0		4334
TOTAL	COST CODE 46007			20,972		202,320		0		0	
	WBS 310101 FDNW				733,079		58,513		0		993,912
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310101 TX-FARM PERF CASING AND GROUT PIPE				20,972		202,320		0		0	
					733,079		58,513		0		993,912

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310111	TY-FARM PERF CASING AND GROUT PIPE										
310111.07	SITE IMPROVEMENTS										
310111.0701002	**********	460	31 EA	0	0	0	0	0	0	0	0
	241-TY FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310111.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310111.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310111.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310111.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	3239 LF	2332	87520	64780	10689	0	0	0	162989
310111.0701104	ASSUME SINGLE CASING 3 LABORERS	460	3239 LF	2332	73411	0	0	0	0	0	73411
310111.0701106	1 TEAMSTER	460	3239 LF	777	29254	0	0	0	0	0	29254
SUBTOTAL	SITE IMPROVEMENTS			5,497		65,780		0		0	
					192,143		10,689		0		268,612
	CONSUMABLES 3.50 %						6725				6725
	GENERAL FOREMAN 3.00 %			165	5764						5764
	GENERAL REQUIREMENTS 20.00 %			1132	39581						39581
	SALES TAX 8.00 %						1393		0		1393
TOTAL	COST CODE 46007			6,794		65,780		0		0	
	WBS 310111 FDNW				237,488		18,807		0		322,075
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310111 TY-FARM PERF CASING AND GROUT PIPE				6,794		65,780		0		0	
					237,488		18,807		0		322,075

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM PERF CASING AND GROUT PIPE										
310121.07	SITE IMPROVEMENTS										
310121.0701002	**********	460	55 EA	0	0	0	0	0	0	0	0
	241-U FARM- PERF CASING MECHANICALLY AND GROUT HOLES										
	**********										
310121.0701004	MOBILIZE INTO FARM-	460	1 LS	24	901	1000	0	0	0	0	1901
	3 OPERATORS AND EQUIPMENT										
310121.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310121.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310121.0701102	3 OPERATORS, DRILL RIG,	460	6297 LF	4534	170161	125940	20780	0	0	0	316881
	ASSUME 2 CUTS EVERY 6"										
	ASSUME $.3/LF FOR BLADES										
	ASSUME GROUT 3 CY/100LF										
310121.0701104	ASSUME SINGLE CASING	460	6297 LF	4534	142730	0	0	0	0	0	142730
	3 LABORERS										
310121.0701106	1 TEAMSTER	460	6297 LF	1511	56889	0	0	0	0	0	56889
310121.0701202	3 OPERATORS, DRILL RIG,	460	750 LF	270	10133	7500	2250	0	0	0	19883
	GROUT HOLES PERFORATED W/JET PACK										
	ASSUME GROUT 3 CY/100LF										
310121.0701204	3 LABORERS	460	750 LF	270	8500	0	0	0	0	0	8500
310121.0701206	1 TEAMSTER	460	750 LF	90	3389	0	0	0	0	0	3389
SUBTOTAL	SITE IMPROVEMENTS			11,265		134,440		0		0	
					393,760		23,030		0		551,230
	CONSUMABLES 3.50 %						13781				13781
	GENERAL FOREMAN 3.00 %			338	11812						11812
	GENERAL REQUIREMENTS 20.00 %			2321	81114						81114
	SALES TAX 8.00 %						2944		0		2944
TOTAL	COST CODE 46007			13,923		134,440		0		0	
	WBS 310121 FDNW				486,687		39,756		0		660,883
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121 U-FARM PERF CASING AND GROUT PIPE				13,923		134,440		0		0	
					486,687		39,756		0		660,883

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320011	A-FARM PERF CASING W/JET PACK										
320011.07	SITE IMPROVEMENTS										
320011.0701002	********** 241-A FARM- PERF CASING W/ JET PACK. 100' AVE LENGTH **********	460	4 EA	0	0	0	0	16000	0	0	16000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	16,000	0	0	16,000
TOTAL	COST CODE 46007 WBS 320011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	16,000	0	0	16,000
TOTAL WBS 320011 A-FARM PERF CASING W/JET PACK				0	0	0	0	16,000	0	0	16,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320031	B-FARM PERF CASING W/JET PACK										
320031.07	SITE IMPROVEMENTS										
320031.0701002	********** 241-B FARM- PERF CASING W/ JET PACK. 155' AVE LENGTH **********	460	7 EA	0	0	0	0	31500	0	0	31500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	31,500	0	0	31,500
TOTAL	COST CODE 46007 WBS 320031 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	31,500	0	0	31,500
TOTAL WBS 320031 B-FARM PERF CASING W/JET PACK				0	0	0	0	31,500	0	0	31,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320041	BX-FARM PERF CASING W/JET PACK										
320041.07	SITE IMPROVEMENTS										
320041.0701002	**********	460	1 EA	0	0	0	0	5000	0	0	5000
	241-BX FARM- PERF CASING W/JET PACK. 255' LENGTH **********										
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	5,000	0	0	5,000
TOTAL	COST CODE 46007 WBS 320041 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	5,000	0	0	5,000
TOTAL WBS 320041 BX-FARM PERF CASING W/JET PACK				0	0	0	0	5,000	0	0	5,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320061	C-FARM PERF CASING W/JET PACK										
320061.07	SITE IMPROVEMENTS										
320061.0701002	********** 241-C FARM- PERF CASING W/ JET PACK. 150' AVE LENGTH **********	460	7 EA	0	0	0	0	31500	0	0	31500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	31,500	0	0	31,500
TOTAL	COST CODE 46007 WBS 320061 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	31,500	0	0	31,500
TOTAL WBS 320061 C-FARM PERF CASING W/JET PACK				0	0	0	0	31,500	0	0	31,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320091	T-FARM PERF CASING W/JET PACK										
320091.07	SITE IMPROVEMENTS										
320091.0701002	**********	460	60 EA	0	0	0	0	240000	0	0	240000
	241-T FARM- PERF CASING W/ JET PACK. 108' AVE LENGTH **********										
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	240,000	0	0	240,000
TOTAL	COST CODE 46007 WBS 320091 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	240,000	0	0	240,000
TOTAL WBS 320091 T-FARM PERF CASING W/JET PACK				0	0	0	0	240,000	0	0	240,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320101	TX-FARM PERF CASING W/JET PACK										
320101.07	SITE IMPROVEMENTS										
320101.0701002	241-TX FARM- PERF CASING W/ JET PACK. 150' LONG	460	1 EA	0	0	0	0	4500	0	0	4500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	4,500	0	0	4,500
TOTAL	COST CODE 46007 WBS 320101 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	4,500	0	0	4,500
TOTAL WBS 320101 TX-FARM PERF CASING W/JET PACK				0	0	0	0	4,500	0	0	4,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320121	U-FARM PERF CASING W/JET PACK										
320121.07	SITE IMPROVEMENTS										
320121.0701002	********** 241-U FARM- PERF CASING W/ JET PACK. 150' AVE LENGTH **********	460	5 EA	0	0	0	0	22500	0	0	22500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	22,500	0	0	22,500
TOTAL	COST CODE 46007 WBS 320121 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	22,500	0	0	22,500
TOTAL WBS 320121 U-FARM PERF CASING W/JET PACK				0	0	0	0	22,500	0	0	22,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COSTS	900	1 LS	0	0	0	0	2670000	0	0	2670000
SUBTOTAL	OTHER COST AND FEES			0	0	0		2,670,000	0	0	2,670,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0		2,670,000	0	0	2,670,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0		2,670,000	0	0	2,670,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				236,788	1,741,690			3,021,000			0
					11,263,615		515,958		0		16,542,264

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	6,120,000	30	1,840,000	7,960,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	10,640,000	30	3,190,000	13,830,000
TOTAL ESTIMATED COST (TEC)		16,760,000	30	5,030,000	21,790,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	2,160,000	30	650,000	2,810,000
TOTAL OTHER PROJECT COSTS (OPC)		2,160,000	30	650,000	2,810,000
TOTAL PROJECT COST (TPC)		18,920,000	30	5,680,000	24,600,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/12/00

LEAD ESTIMATOR: DL GUNDERSON — ESTIMATING MANAGER: FC DAY

PROJECT MANAGER:

CLIENT:

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
SUBTOTAL 11	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
310011	A-FARM GROUT PIPE	189688	140080	329768	4.99	16455	346224	30	103867	450091
310021	AX-FARM GROUT PIPE	136906	101104	238010	4.99	11876	249887	30	74966	324853
310031	B-FARM GROUT PIPE	144894	106959	251853	4.99	12567	264420	30	79326	343746
310041	BX-FARM GROUT PIPE	240528	177558	418086	4.99	20862	438948	30	131684	570633
310051	BY-FARM GROUT PIPE	210032	155042	365074	4.99	18217	383291	30	114987	498279
310061	C-FARM GROUT PIPE	201326	148618	349944	4.99	17462	367406	30	110222	477628
310071	S-FARM GROUT PIPE	232289	171471	403760	4.99	20147	423908	30	127172	551080
310081	SX-FARM GROUT PIPE	302513	223308	525821	4.99	26238	552059	30	165617	717677
310091	T-FARM GROUT PIPE	290406	214375	504781	4.99	25188	529969	30	158990	688960
310101	TX-FARM GROUT PIPE	277656	204962	482618	4.99	24082	506701	30	152010	658711
310111	TY-FARM GROUT PIPE	90274	66642	156916	4.99	7830	164746	30	49423	214170
310121	U-FARM GROUT PIPE	193710	142999	336709	4.99	16801	353511	30	106053	459564
SUBTOTAL 31	CONSTRUCTION FORCES	2510222	1853123	4363345	4.99	217730	4581076	30	1374323	5955399
320011	A-FARM PERFORATE WITH JET PACK	238500	167110	405610	4.99	20239	425850	30	127755	553606
320021	AX-FARM PERFORATE WITH JET PACK	208000	145740	353740	4.99	17651	371391	30	111417	482809
320031	B-FARM PERFORATE WITH JET PACK	192000	134529	326529	4.99	16293	342823	30	102846	445670
320041	BX-FARM PERFORATE WITH JET PACK	328000	229821	557821	4.99	27835	585656	30	175696	761353
320051	BY-FARM PERFORATE WITH JET PACK	284000	198991	482991	4.99	24101	507092	30	152127	659220
320061	C-FARM PERFORATE WITH JET PACK	280000	196188	476188	4.99	23761	499950	30	149985	649935
320071	S-FARM PERFORATE WITH JET PACK	292000	204596	496596	4.99	24780	521377	30	156413	677790
320081	SX-FARM PERFORATE WITH JET PACK	420000	294283	714283	4.99	35642	749925	30	224977	974903
320091	T-FARM PERFORATE WITH JET PACK	380000	266256	646256	4.99	32248	678504	30	203551	882055
320101	TX-FARM PERFORATE WITH JET PACK	408000	285875	693875	4.99	34624	728499	30	218549	947049
320111	TY-FARM PERFORATE WITH JET PACK	124000	86883	210883	4.99	10523	221406	30	66422	287828
320121	U-FARM PERFORATE WITH JET PACK	240000	168161	408161	4.99	20367	428529	30	128558	557087
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	3394500	2378438	5772938	4.99	288069	6061008	30	1818302	7879310
500000	OPERATING CONTRACTOR (CHG)	1770000	286563	2056563	4.99	102622	2159185	30	647755	2806941

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCK1

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
ORDER OF MAGNITUDE
DOE_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

DATE 10/12/00 11:22:21
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
PROJECT TOTAL		12,631,718	5,392,043	18,023,761	4.99	899,385	18,923,147	30	5,676,944	24,600,091

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(2) A FACTOR OF 45.9% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS.
(3) CONSUMABLES ARE ESTIMATED AT 3.5% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 3% HAS BEEN APPLIED TO DIRECT CRAFT LABOR.
(6) A FACTOR OF 10% HAS BEEN APPLIED TO DIRECT CRAFT LABOR AND 0.25% TO ENGINEERING TO ALLOW FOR USAGE OF GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNCORP.
(7) CONTRACT ADMINISTRATION FACTOR OF 45.9% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEES

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR FEDERAL SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR FEDERAL SERVICES COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMANS COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE AND G&A/FEE TO DEVELOP A FULLY BURDENED RATE BY CRAFT.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 17.38%
(2) FDH GFS/G&A - GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO CONSTRUCTION MANAGEMENT AND ADMINISTRATION, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS
(4) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

7. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE SUBCONTRACTOR FOR PERFORATING WITH JET PACK AND GROUTING BY CONSTRUCTION FORCES.

B.) SUBCONTRACT RATE SUPPLIED BY FFS PROJECT MANAGER,

C.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
TOTAL 000	ENGINEERING	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
460	IMPROVEMENTS TO LAND									
310011	A-FARM GROUT PIPE	189688	140080	329768	4.99	16455	346224	30	103867	450091
310021	AX-FARM GROUT PIPE	136906	101104	238010	4.99	11876	249887	30	74966	324853
310031	B-FARM GROUT PIPE	144894	106959	251853	4.99	12567	264420	30	79326	343746
310041	BX-FARM GROUT PIPE	240528	177558	418086	4.99	20862	438948	30	131684	570633
310051	BY-FARM GROUT PIPE	210032	155042	365074	4.99	18217	383291	30	114987	498279
310061	C-FARM GROUT PIPE	201326	148618	349944	4.99	17462	367406	30	110222	477628
310071	S-FARM GROUT PIPE	232289	171471	403760	4.99	20147	423908	30	127172	551080
310081	SX-FARM GROUT PIPE	302513	223308	525821	4.99	26238	552059	30	165617	717677
310091	T-FARM GROUT PIPE	290406	214375	504781	4.99	25188	529969	30	158990	688960
310101	TX-FARM GROUT PIPE	277656	204962	482618	4.99	24082	506701	30	152010	658711
310111	TY-FARM GROUT PIPE	90274	66642	156916	4.99	7830	164746	30	49423	214170
310121	U-FARM GROUT PIPE	193710	142999	336709	4.99	16801	353511	30	106053	459564
320011	A-FARM PERFORATE WITH JET PACK	238500	167110	405610	4.99	20239	425850	30	127755	553606
320021	AX-FARM PERFORATE WITH JET PACK	208000	145740	353740	4.99	17651	371391	30	111417	482809
320031	B-FARM PERFORATE WITH JET PACK	192000	134529	326529	4.99	16293	342823	30	102846	445670
320041	BX-FARM PERFORATE WITH JET PACK	328000	229821	557821	4.99	27835	585656	30	175696	761353
320051	BY-FARM PERFORATE WITH JET PACK	284000	198991	482991	4.99	24101	507092	30	152127	659220
320061	C-FARM PERFORATE WITH JET PACK	280000	196188	476188	4.99	23761	499950	30	149985	649935
320071	S-FARM PERFORATE WITH JET PACK	292000	204596	496596	4.99	24780	521377	30	156413	677790
320081	SX-FARM PERFORATE WITH JET PACK	420000	294283	714283	4.99	35642	749925	30	224977	974903
320091	T-FARM PERFORATE WITH JET PACK	380000	266256	646256	4.99	32248	678504	30	203551	882055
320101	TX-FARM PERFORATE WITH JET PACK	408000	285875	693875	4.99	34624	728499	30	218549	947049
320111	TY-FARM PERFORATE WITH JET PACK	124000	86883	210883	4.99	10523	221406	30	66422	287828
320121	U-FARM PERFORATE WITH JET PACK	240000	168161	408161	4.99	20367	428529	30	128558	557087
TOTAL 460	IMPROVEMENTS TO LAND	5904722	4231562	10136284	4.99	505800	10642085	30	3192625	13834710
900	PROJECT SUPPORT									

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)	1770000	286563	2056563	4.99	102622	2159185	30	647755	2806941
TOTAL 900	PROJECT SUPPORT	1770000	286563	2056563	4.99	102622	2159185	30	647755	2806941
PROJECT TOTAL		12,631,718	5,392,043	18,023,761	4.99	899,385	18,923,147	30	5,676,944	24,600,091

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
	TOTAL ENGINEERING	4,956,996	873,918	5,830,914	4.99	290,962	6,121,877	30	1,836,563	7,958,440
CONSTRUCTION										
07	SITE IMPROVEMENTS	5904722	4231562	10136284	4.99	505800	10642085	30	3192625	13834710
99	OTHER COST AND FEES	1770000	286563	2056563	4.99	102622	2159185	30	647755	2806941
	TOTAL CONSTRUCTION	7,674,722	4,518,125	12,192,847	4.99	608,423	12,801,270	30	3,840,381	16,641,651
	PROJECT TOTAL	12,631,718	5,392,043	18,023,761	4.99	899,385	18,923,147	30	5,676,944	24,600,091

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	2953104	0.00	0	7382	513249	520632
121100	ENGINEERING DURING CONSTRUCTION	2003892	0.00	0	5009	348276	353286
310011	A-FARM GROUT PIPE	189688	45.90	87066	12185	40828	140080
310021	AX-FARM GROUT PIPE	136906	45.90	62839	8800	29464	101104
310031	B-FARM GROUT PIPE	144894	45.90	66506	9292	31160	106959
310041	BX-FARM GROUT PIPE	240528	45.90	110402	15416	51739	177558
310051	BY-FARM GROUT PIPE	210032	45.90	96404	13462	45175	155042
310061	C-FARM GROUT PIPE	201326	45.90	92408	12905	43304	148618
310071	S-FARM GROUT PIPE	232289	45.90	106620	14886	49964	171471
310081	SX-FARM GROUT PIPE	302513	45.90	138853	19381	65073	223308
310091	T-FARM GROUT PIPE	290406	45.90	133296	18607	62471	214375
310101	TX-FARM GROUT PIPE	277656	45.90	127444	17791	59727	204962
310111	TY-FARM GROUT PIPE	90274	45.90	41435	5797	19409	66642
310121	U-FARM GROUT PIPE	193710	45.90	88912	12419	41666	142999
320011	A-FARM PERFORATE WITH JET PACK	238500	45.90	109471	0	57639	167110
320021	AX-FARM PERFORATE WITH JET PACK	208000	45.90	95472	0	50268	145740
320031	B-FARM PERFORATE WITH JET PACK	192000	45.90	88128	0	46401	134529
320041	BX-FARM PERFORATE WITH JET PACK	328000	45.90	150552	0	79269	229821
320051	BY-FARM PERFORATE WITH JET PACK	284000	45.90	130356	0	68635	198991
320061	C-FARM PERFORATE WITH JET PACK	280000	45.90	128520	0	67668	196188
320071	S-FARM PERFORATE WITH JET PACK	292000	45.90	134028	0	70568	204596
320081	SX-FARM PERFORATE WITH JET PACK	420000	45.90	192780	0	101503	294283
320091	T-FARM PERFORATE WITH JET PACK	380000	45.90	174420	0	91836	266256
320101	TX-FARM PERFORATE WITH JET PACK	408000	45.90	187272	0	98603	285875
320111	TY-FARM PERFORATE WITH JET PACK	124000	45.90	56916	0	29967	86883
320121	U-FARM PERFORATE WITH JET PACK	240000	45.90	110160	0	58001	168161
500000	OPERATING CONTRACTOR (CHG)	1770000	0.00	0	0	286563	286563
PROJECT TOTAL		12,631,718		2,710,267	173,338	2,508,438	5,392,043

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCK1

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

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BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 50% OF TOTAL CONSTRUCTION COSTS OF APPROX $5,900,000	000	33600 MHR	33600	2953104	0	0	0	0	0	2953104
SUBTOTAL	HOME OFFICE LABOR			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL WBS 111100 DEFINITIVE DESIGN				33,600	2,953,104	0	0	0	0	0	2,953,104

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	E&I DURING CONSTRUCTION 34% OF TOTAL CONSTRUCTION COSTS OF APPROX $5,900,000	000	22800 MHR	22800	2003892	0	0	0	0	0	2003892
SUBTOTAL	HOME OFFICE LABOR			22,800	2,003,892	0	0	0	0	0	2,003,892
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			22,800	2,003,892	0	0	0	0	0	2,003,892
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				22,800	2,003,892	0	0	0	0	0	2,003,892

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310011	A-FARM GROUT PIPE										
310011.07	SITE IMPROVEMENTS										
310011.0701002	**********	460	53 EA	0	0	0	0	0	0	0	0
	241-A FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310011.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	587	600	0	0	0	0	1187
310011.0701006	2 LABORER	460	1 LS	16	512	0	0	0	0	0	512
310011.0701008	1 TEAMSTER	460	1 LS	8	315	0	0	0	0	0	315
	**********										
310011.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	6873 LF	1100	40370	41238	20619	0	0	0	102227
310011.0701104	2 LABORERS	460	6873 LF	1100	35178	0	0	0	0	0	35178
310011.0701106	1 TEAMSTER	460	6873 LF	550	21626	0	0	0	0	0	21626
	**********										
SUBTOTAL	SITE IMPROVEMENTS			2,790		41,838		0		0	
					98,588		20,619		0		161,045
	CONSUMABLES 3.50 %						3450				3450
	GENERAL FOREMAN 3.00 %			84	2957						2957
	GENERAL REQUIREMENTS 20.00 %			575	20309						20309
	SALES TAX 8.00 %						1925		0		1925
TOTAL	COST CODE 46007			3,448		41,838		0		0	
	WBS 310011 FDNW				121,854		25,995		0		189,687
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310011 A-FARM GROUT PIPE				3,448		41,838		0		0	
					121,854		25,995		0		189,687

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310021	AX-FARM GROUT PIPE										
310021.07	SITE IMPROVEMENTS										
310021.0701002	**********	460	52 EA	0	0	0	0	0	0	0	0
	241-AX FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310021.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	587	600	0	0	0	0	1187
310021.0701006	2 LABORER	460	1 LS	16	512	0	0	0	0	0	512
310021.0701008	1 TEAMSTER	460	1 LS	8	315	0	0	0	0	0	315
	**********										
310021.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	4936 LF	790	28993	29616	14808	0	0	0	73417
310021.0701104	2 LABORERS	460	4936 LF	790	25264	0	0	0	0	0	25264
310021.0701106	1 TEAMSTER	460	4936 LF	395	15531	0	0	0	0	0	15531
	**********										
SUBTOTAL	SITE IMPROVEMENTS			2,015		30,216		0		0	
					71,202		14,808		0		116,226
	CONSUMABLES 3.50 %						2492				2492
	GENERAL FOREMAN 3.00 %			60	2136						2136
	GENERAL REQUIREMENTS 20.00 %			415	14667						14667
	SALES TAX 8.00 %						1384		0		1384
TOTAL	COST CODE 46007			2,490		30,216		0		0	
	WBS 310021 FDNW				88,005		18,684		0		136,905
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021 AX-FARM GROUT PIPE				2,490		30,216		0		0	
					88,005		18,684		0		136,905

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310031	B-FARM GROUT PIPE										
310031.07	SITE IMPROVEMENTS										
310031.0701002	**********	460	48 EA	0	0	0	0	0	0	0	0
	241-B FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310031.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	587	600	0	0	0	0	1187
310031.0701006	2 LABORER	460	1 LS	16	512	0	0	0	0	0	512
310031.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310031.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	5252 LF	840	31525	31512	15756	0	0	0	78793
310031.0701104	2 LABORERS	460	5252 LF	840	26443	0	0	0	0	0	26443
310031.0701106	1 TEAMSTER	460	5252 LF	420	15813	0	0	0	0	0	15813
	**********										
SUBTOTAL	SITE IMPROVEMENTS			2,140		32,112		0		0	
					75,181		15,756		0		123,049
	CONSUMABLES 3.50 %						2631				2631
	GENERAL FOREMAN 3.00 %			64	2255						2255
	GENERAL REQUIREMENTS 20.00 %			441	15487						15487
	SALES TAX 8.00 %						1470		0		1470
TOTAL	COST CODE 46007			2,645		32,112		0		0	
	WBS 310031 FDNW				92,923		19,858		0		144,894
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310031 B-FARM GROUT PIPE				2,645		32,112		0		0	
					92,923		19,858		0		144,894

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BX-FARM GROUT PIPE										
310041.07	SITE IMPROVEMENTS										
310041.0701002	**********	460	82 EA	0	0	0	0	0	0	0	0
	241-BX FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310041.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310041.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310041.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310041.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	8772 LF	1404	52692	52632	26316	0	0	0	131640
310041.0701104	2 LABORERS	460	8772 LF	1404	44198	0	0	0	0	0	44198
310041.0701106	1 TEAMSTER	460	8772 LF	702	26430	0	0	0	0	0	26430
	**********										
SUBTOTAL	SITE IMPROVEMENTS			3,550		53,232		0		0	
					124,725		26,316		0		204,273
	CONSUMABLES 3.50 %						4365				4365
	GENERAL FOREMAN 3.00 %			107	3741						3741
	GENERAL REQUIREMENTS 20.00 %			731	25693						25693
	SALES TAX 8.00 %						2454		0		2454
TOTAL	COST CODE 46007			4,387		53,232		0		0	
	WBS 310041 FDNW				154,160		33,135		0		240,527
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310041 BX-FARM GROUT PIPE				4,387		53,232		0		0	
					154,160		33,135		0		240,527

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310051	BY-FARM GROUT PIPE										
310051.07	SITE IMPROVEMENTS										
310051.0701002	**********	460	71 EA	0	0	0	0	0	0	0	0
	241-BY FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310051.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310051.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310051.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310051.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	7651 LF	1224	45937	45906	22953	0	0	0	114796
310051.0701104	2 LABORERS	460	7651 LF	1224	38532	0	0	0	0	0	38532
310051.0701106	1 TEAMSTER	460	7651 LF	612	23042	0	0	0	0	0	23042
	**********										
SUBTOTAL	SITE IMPROVEMENTS			3,100		46,506		0		0	
					108,916		22,953		0		178,375
	CONSUMABLES 3.50 %						3812				3812
	GENERAL FOREMAN 3.00 %			93	3267						3267
	GENERAL REQUIREMENTS 20.00 %			639	22436						22436
	SALES TAX 8.00 %						2141		0		2141
TOTAL	COST CODE 46007			3,831		46,506		0		0	
	WBS 310051 FDNW				134,620		28,906		0		210,032
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310051 BY-FARM GROUT PIPE				3,831		46,506		0		0	
					134,620		28,906		0		210,032

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310061	C-FARM GROUT PIPE										
310061.07	SITE IMPROVEMENTS										
310061.0701002	**********	460	70 EA	0	0	0	0	0	0	0	0
	241-C FARM- GROUT CASING										
	AFTER SUB. PERFORATES CASING										
	**********										
310061.0701004	MOBILIZE INTO FARM-	460	1 LS	16	600	600	0	0	0	0	1200
	2 OPERATORS AND EQUIPMENT										
310061.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310061.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310061.0701102	GROUT HOLES-	460	7329 LF	1173	44023	43974	21987	0	0	0	109984
	2 OPERATORS, EQUIPMENT										
	ASSUME GROUT 3 CY/100LF										
310061.0701104	2 LABORERS	460	7329 LF	1173	36926	0	0	0	0	0	36926
310061.0701106	1 TEAMSTER	460	7329 LF	586	22063	0	0	0	0	0	22063
	**********										
SUBTOTAL	SITE IMPROVEMENTS			2,972		44,574		0		0	
					104,417		21,987		0		170,978
	CONSUMABLES 3.50 %						3654				3654
	GENERAL FOREMAN 3.00 %			89	3132						3132
	GENERAL REQUIREMENTS 20.00 %			612	21509						21509
	SALES TAX 8.00 %						2051		0		2051
TOTAL	COST CODE 46007			3,673		44,574		0		0	
	WBS 310061 FDNW				129,059		27,692		0		201,326
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM GROUT PIPE				3,673		44,574		0		0	
					129,059		27,692		0		201,326

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310071	S-FARM GROUT PIPE										
310071.07	SITE IMPROVEMENTS										
310071.0701002	**********	460	73 EA	0	0	0	0	0	0	0	0
	241-S FARM- GROUT CASING AFTER SUB. PERFORATES CASING **********										
310071.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310071.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310071.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310071.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	8471 LF	1355	50853	50826	25413	0	0	0	127092
310071.0701104	2 LABORERS	460	8471 LF	1355	42655	0	0	0	0	0	42655
310071.0701106	1 TEAMSTER **********	460	8471 LF	678	25527	0	0	0	0	0	25527
SUBTOTAL	SITE IMPROVEMENTS			3,428		51,426		0		0	
					120,440		25,413		0		197,279
	CONSUMABLES 3.50 %						4215				4215
	GENERAL FOREMAN 3.00 %			103	3613						3613
	GENERAL REQUIREMENTS 20.00 %			706	24810						24810
	SALES TAX 8.00 %						2370		0		2370
TOTAL	COST CODE 46007			4,237		51,426		0		0	
	WBS 310071 FDNW				148,863		31,998		0		232,288
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310071 S-FARM GROUT PIPE				4,237		51,426		0		0	
					148,863		31,998		0		232,288

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	SX-FARM GROUT PIPE										
310081.07	SITE IMPROVEMENTS										
310081.0701002	********** 241-SX FARM- GROUT CASING AFTER SUB. PERFORATES CASING **********	460	105 EA	0	0	0	0	0	0	0	0
310081.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310081.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310081.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310081.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	11058 LF	1769	66391	66348	33174	0	0	0	165913
310081.0701104	2 LABORERS	460	11058 LF	1769	55688	0	0	0	0	0	55688
310081.0701106	1 TEAMSTER **********	460	11058 LF	885	33320	0	0	0	0	0	33320
SUBTOTAL	SITE IMPROVEMENTS			4,463		66,948		0		0	
					156,804		33,174		0		256,926
	CONSUMABLES 3.50 %						5488				5488
	GENERAL FOREMAN 3.00 %			134	4704						4704
	GENERAL REQUIREMENTS 20.00 %			919	32301						32301
	SALES TAX 8.00 %						3092		0		3092
TOTAL	COST CODE 46007			5,516		66,948		0		0	
	WBS 310081 FDNW				193,809		41,755		0		302,512
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081 SX-FARM GROUT PIPE				5,516		66,948		0		0	
					193,809		41,755		0		302,512

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310091	T-FARM GROUT PIPE										
310091.07	SITE IMPROVEMENTS										
310091.0701002	**********	460	95 EA	0	0	0	0	0	0	0	0
	241-T FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310091.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310091.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310091.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310091.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	10610 LF	1698	63726	63660	31830	0	0	0	159216
310091.0701104	2 LABORERS	460	10610 LF	1698	53453	0	0	0	0	0	53453
310091.0701106	1 TEAMSTER	460	10610 LF	849	31965	0	0	0	0	0	31965
	**********										
SUBTOTAL	SITE IMPROVEMENTS			4,285		64,260		0		0	
					150,549		31,830		0		246,639
	CONSUMABLES 3.50 %						5269				5269
	GENERAL FOREMAN 3.00 %			129	4516						4516
	GENERAL REQUIREMENTS 20.00 %			883	31013						31013
	SALES TAX 8.00 %						2967		0		2967
TOTAL	COST CODE 46007			5,296		64,260		0		0	
	WBS 310091 FDNW				186,078		40,067		0		290,405
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091 T-FARM GROUT PIPE				5,296		64,260		0		0	
					186,078		40,067		0		290,405

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310101	TX-FARM GROUT PIPE										
310101.07	SITE IMPROVEMENTS										
310101.0701002	**********	460	102 EA	0	0	0	0	0	0	0	0
	241-TX FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310101.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310101.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310101.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310101.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	10141 LF	1623	60911	60846	30423	0	0	0	152180
310101.0701104	2 LABORERS	460	10141 LF	1623	51092	0	0	0	0	0	51092
310101.0701106	1 TEAMSTER	460	10141 LF	811	30534	0	0	0	0	0	30534
	**********										
SUBTOTAL	SITE IMPROVEMENTS			4,097		61,446		0		0	
					143,942		30,423		0		235,811
	CONSUMABLES 3.50 %						5037				5037
	GENERAL FOREMAN 3.00 %			123	4318						4318
	GENERAL REQUIREMENTS 20.00 %			844	29652						29652
	SALES TAX 8.00 %						2836		0		2836
TOTAL	COST CODE 46007			5,063		61,446		0		0	
	WBS 310101 FDNW				177,912		38,297		0		277,656
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310101 TX-FARM GROUT PIPE				5,063		61,446		0		0	
					177,912		38,297		0		277,656

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310111	TY-FARM GROUT PIPE										
310111.07	SITE IMPROVEMENTS										
310111.0701002	**********	460	31 EA	0	0	0	0	0	0	0	0
	241-TY FARM- GROUT CASING										
	AFTER SUB. PERFORATES CASING										
	**********										
310111.0701004	MOBILIZE INTO FARM-	460	1 LS	16	600	600	0	0	0	0	1200
	2 OPERATORS AND EQUIPMENT										
310111.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310111.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310111.0701102	GROUT HOLES-	460	3239 LF	518	19441	19434	9717	0	0	0	48592
	2 OPERATORS, EQUIPMENT										
	ASSUME GROUT 3 CY/100LF										
310111.0701104	2 LABORERS	460	3239 LF	518	16307	0	0	0	0	0	16307
310111.0701106	1 TEAMSTER	460	3239 LF	259	9751	0	0	0	0	0	9751
	**********										
SUBTOTAL	SITE IMPROVEMENTS			1,335		20,034		0		0	
					46,904		9,717		0		76,655
	CONSUMABLES 3.50 %						1641				1641
	GENERAL FOREMAN 3.00 %			40	1407						1407
	GENERAL REQUIREMENTS 20.00 %			275	9662						9662
	SALES TAX 8.00 %						908		0		908
TOTAL	COST CODE 46007			1,650		20,034		0		0	
	WBS 310111 FDNW				57,973		12,267		0		90,274
	(ESCALATION 4.99% - CONTINGENCY		30.00 %)								
TOTAL WBS 310111 TY-FARM GROUT PIPE				1,650		20,034		0		0	
					57,973		12,267		0		90,274

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM GROUT PIPE										
310121.07	SITE IMPROVEMENTS										
310121.0701002	**********	460	60 LF	0	0	0	0	0	0	0	0
	241-U FARM- GROUT CASING AFTER SUB. PERFORATES CASING										
	**********										
310121.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310121.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310121.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310121.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	7047 LF	1128	42334	42282	21141	0	0	0	105757
310121.0701104	2 LABORERS	460	7047 LF	1128	35509	0	0	0	0	0	35509
310121.0701106	1 TEAMSTER	460	7047 LF	564	21235	0	0	0	0	0	21235
	**********										
SUBTOTAL	SITE IMPROVEMENTS			2,860		42,882		0		0	
					100,483		21,141		0		164,506
	CONSUMABLES 3.50 %						3516				3516
	GENERAL FOREMAN 3.00 %			86	3014						3014
	GENERAL REQUIREMENTS 20.00 %			589	20699						20699
	SALES TAX 8.00 %						1972		0		1972
TOTAL	COST CODE 46007			3,534		42,882		0		0	
	WBS 310121 FDNW				124,196		26,630		0		193,709
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121 U-FARM GROUT PIPE				3,534		42,882		0		0	
					124,196		26,630		0		193,709

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320011	A-FARM PERFORATE WITH JET PACK										
320011.07	SITE IMPROVEMENTS										
320011.0701002	**********	460	53 EA	0	0	0	0	0	0	0	0
	241-A FARM- JET PACK CHARGE TO PERFORATE CASING **********										
320011.0701102	SUBCONTRACTOR PERFORATES AVERAGE LENGTH 130'	460	53 EA	0	0	0	0	238500	0	0	238500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	238,500	0	0	238,500
TOTAL	COST CODE 46007			0	0	0	0	238,500	0	0	238,500
	WBS 320011 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320011 A-FARM PERFORATE WITH JET PACK				0	0	0	0	238,500	0	0	238,500

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320021	AX-FARM PERFORATE WITH JET PACK										
320021.07	SITE IMPROVEMENTS										
320021.0701002	********** 241-AX FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	52 EA	0	0	0	0	0	0	0	0
320021.0701102	SUBCONTRACTOR PERFORATES 95' AVERAGE LENGTH	460	52 EA	0	0	0	0	208000	0	0	208000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	208,000	0	0	208,000
TOTAL	COST CODE 46007 WBS 320021 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	208,000	0	0	208,000
TOTAL WBS 320021 AX-FARM PERFORATE WITH JET PACK				0	0	0	0	208,000	0	0	208,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320031	B-FARM PERFORATE WITH JET PACK										
320031.07	SITE IMPROVEMENTS										
320031.0701002	********** 241-B FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	48 EA	0	0	0	0	0	0	0	0
320031.0701102	SUBCONTRACTOR PERFORATES 109' AVERAGE LENGTH	460	48 EA	0	0	0	0	192000	0	0	192000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	192,000	0	0	192,000
TOTAL	COST CODE 46007 WBS 320031 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	192,000	0	0	192,000
TOTAL WBS 320031 B-FARM PERFORATE WITH JET PACK				0	0	0	0	192,000	0	0	192,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320041	BX-FARM PERFORATE WITH JET PACK										
320041.07	SITE IMPROVEMENTS										
320041.0701002	********** 241-BX FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	82 EA	0	0	0	0	0	0	0	0
320041.0701102	SUBCONTRACTOR PERFORATES 107' AVERAGE LENGTH	460	82 EA	0	0	0	0	328000	0	0	328000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	328,000	0	0	328,000
TOTAL	COST CODE 46007 WBS 320041 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	328,000	0	0	328,000
TOTAL WBS 320041 BX-FARM PERFORATE WITH JET PACK				0	0	0	0	328,000	0	0	328,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320051	BY-FARM PERFORATE WITH JET PACK										
320051.07	SITE IMPROVEMENTS										
320051.0701002	**********	460	71 EA	0	0	0	0	0	0	0	0
	241-BY FARM- JET PACK CHARGE TO PERFORATE CASING **********										
320051.0701102	SUBCONTRACTOR PERFORATES 108' AVERAGE LENGTH	460	71 EA	0	0	0	0	284000	0	0	284000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	284,000	0	0	284,000
TOTAL	COST CODE 46007			0	0	0	0	284,000	0	0	284,000
	WBS 320051 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320051 BY-FARM PERFORATE WITH JET PACK				0	0	0	0	284,000	0	0	284,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320061	C-FARM PERFORATE WITH JET PACK										
320061.07	SITE IMPROVEMENTS										
320061.0701002	********** 241-C FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	70 EA	0	0	0	0	0	0	0	0
320061.0701102	SUBCONTRACTOR PERFORATES 105' AVERAGE LENGTH	460	70 EA	0	0	0	0	280000	0	0	280000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	280,000	0	0	280,000
TOTAL	COST CODE 46007 WBS 320061 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	280,000	0	0	280,000
TOTAL WBS 320061 C-FARM PERFORATE WITH JET PACK				0	0	0	0	280,000	0	0	280,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320071	S-FARM PERFORATE WITH JET PACK										
320071.07	SITE IMPROVEMENTS										
320071.0701002	********** 241-S FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	73 EA	0	0	0	0	0	0	0	0
320071.0701102	SUBCONTRACTOR PERFORATES 116' AVERAGE LENGTH	460	73 EA	0	0	0	0	292000	0	0	292000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	292,000	0	0	292,000
TOTAL	COST CODE 46007 WBS 320071 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	292,000	0	0	292,000
TOTAL WBS 320071 S-FARM PERFORATE WITH JET PACK				0	0	0	0	292,000	0	0	292,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320081	SX-FARM PERFORATE WITH JET PACK										
320081.07	SITE IMPROVEMENTS										
320081.0701002	**********	460	105 EA	0	0	0	0	0	0	0	0
	241-SX FARM- JET PACK CHARGE TO PERFORATE CASING										
	**********										
320081.0701102	SUBCONTRACTOR PERFORATES 105' AVERAGE LENGTH	460	105 EA	0	0	0	0	420000	0	0	420000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	420,000	0	0	420,000
TOTAL	COST CODE 46007			0	0	0	0	420,000	0	0	420,000
	WBS 320081 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320081 SX-FARM PERFORATE WITH JET PACK				0	0	0	0	420,000	0	0	420,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320091	T-FARM PERFORATE WITH JET PACK										
320091.07	SITE IMPROVEMENTS										
320091.0701002	********** 241-T FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	95 EA	0	0	0	0	0	0	0	0
320091.0701102	SUBCONTRACTOR PERFORATES 112' AVERAGE LENGTH	460	95 EA	0	0	0	0	380000	0	0	380000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	380,000	0	0	380,000
TOTAL	COST CODE 46007 WBS 320091 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	380,000	0	0	380,000
TOTAL WBS 320091 T-FARM PERFORATE WITH JET PACK				0	0	0	0	380,000	0	0	380,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320101	TX-FARM PERFORATE WITH JET PACK										
320101.07	SITE IMPROVEMENTS										
320101.0701002	********** 241-TX FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	102 EA	0	0	0	0	0	0	0	0
320101.0701102	SUBCONTRACTOR PERFORATES 99' AVERAGE LENGTH	460	102 EA	0	0	0	0	408000	0	0	408000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	408,000	0	0	408,000
TOTAL	COST CODE 46007 WBS 320101 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	408,000	0	0	408,000
TOTAL WBS 320101 TX-FARM PERFORATE WITH JET PACK				0	0	0	0	408,000	0	0	408,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320111	TY-FARM PERFORATE WITH JET PACK										
320111.07	SITE IMPROVEMENTS										
320111.0701002	********** 241-TY FARM- JET PACK CHARGE TO PERFORATE CASING **********	460	31 EA	0	0	0	0	0	0	0	0
320111.0701102	SUBCONTRACTOR PERFORATES 104' AVERAGE LENGTH	460	31 EA	0	0	0	0	124000	0	0	124000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	124,000	0	0	124,000
TOTAL	COST CODE 46007 WBS 320111 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	124,000	0	0	124,000
TOTAL WBS 320111 TY-FARM PERFORATE WITH JET PACK				0	0	0	0	124,000	0	0	124,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320121	U-FARM PERFORATE WITH JET PACK										
320121.07	SITE IMPROVEMENTS										
320121.0701002	**********	460	60 EA	0	0	0	0	0	0	0	0
	241-U FARM- JET PACK CHARGE TO PERFORATE CASING										
	**********										
320121.0701102	SUBCONTRACTOR PERFORATES 117' AVERAGE LENGTH	460	60 EA	0	0	0	0	240000	0	0	240000
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	240,000	0	0	240,000
TOTAL	COST CODE 46007			0	0	0	0	240,000	0	0	240,000
	WBS 320121 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320121 U-FARM PERFORATE WITH JET PACK				0	0	0	0	240,000	0	0	240,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.990102	CHG PROJECT COSTS 30% OF TOTAL CONSTRUCTION COSTS	900	1 LS	0	0	0	0	1770000	0	0	1770000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	1,770,000	0	0	1,770,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	1,770,000	0	0	1,770,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	1,770,000	0	0	1,770,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				102,175	6,566,454	555,474	345,289	5,164,500	0	0	12,631,717

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	6,120,000	30	1,840,000	7,960,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	18,920,000	30	5,670,000	24,590,000
TOTAL ESTIMATED COST (TEC)		25,040,000	30	7,510,000	32,550,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	3,770,000	0	0	3,770,000
TOTAL OTHER PROJECT COSTS (OPC)		3,770,000	0	0	3,770,000
TOTAL PROJECT COST (TPC)		28,810,000	26	7,510,000	36,320,000

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	10/12/00	
LEAD ESTIMATOR	DL GUNDERSON	ESTIMATING MANAGER	FC DAY
PROJECT MANAGER			
CLIENT			

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
SUBTOTAL 11	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
310011	A-FARM REMOVE INNER CASE THEN GROUT	740775	554480	1295255	4.99	64633	1359888	30	407966	1767855
310021	AXFARM REMOVE INNER CASE THEN GROUT	489051	367224	856275	4.99	42728	899003	30	269701	1168704
310031	B-FARM REMOVE INNER CASE THEN GROUT	607613	453848	1061461	4.99	52966	1114428	30	334328	1448757
310041	BXFARM REMOVE INNER CASE THEN GROUT	889938	667528	1557466	4.99	77717	1635184	30	490555	2125739
310051	BYFARM REMOVE INNER CASE THEN GROUT	756101	567784	1323885	4.99	66061	1389947	30	416984	1806932
310061	C-FARM REMOVE INNER CASE THEN GROUT	811992	607346	1419338	4.99	70825	1490163	30	447049	1937212
310071	S-FARM REMOVE INNER CASE THEN GROUT	836736	628342	1465078	4.99	73107	1538185	30	461455	1999641
310081	SXFARM REMOVE INNER CASE THEN GROUT	1091246	819487	1910733	4.99	95345	2006079	30	601823	2607903
310091	T-FARM REMOVE INNER CASE THEN GROUT	1985812	1463402	3449214	4.99	172115	3621330	30	1086399	4707729
310101	TXFARM REMOVE INNER CASE THEN GROUT	1013580	760815	1774395	4.99	88542	1862937	30	558881	2421819
310111	TYFARM REMOVE INNER CASE THEN GROUT	322076	241819	563895	4.99	28138	592033	30	177610	769643
310121	U-FARM REMOVE INNER CASE THEN GROUT	766054	573935	1339989	4.99	66865	1406854	30	422056	1828911
SUBTOTAL 31	CONSTRUCTION FORCES	10310974	7706017	18016991	4.99	899047	18916039	30	5674811	24590851
500000	OPERATING CONTRACTOR (CHG)	3090000	500271	3590271	4.99	179154	3769425	0	0	3769425
PROJECT TOTAL		18,357,970	9,080,207	27,438,177	4.99	1,369,165	28,807,342	26	7,511,374	36,318,717

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(2) A FACTOR OF 45.9% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS.
(3) CONSUMABLES ARE ESTIMATED AT 3.5% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 3% HAS BEEN APPLIED TO DIRECT CRAFT LABOR.
(6) A FACTOR OF 10% HAS BEEN APPLIED TO DIRECT CRAFT LABOR AND 0.25% TO ENGINEERING TO ALLOW FOR USAGE OF GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNCORP.

C. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR FEDERAL SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR FEDERAL SERVICES COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMANS COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE AND G&A/FEE TO DEVELOP A FULLY BURDENED RATE BY CRAFT.

D. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.
(1) FDH GFS/G&A CONST. MGT. RATE (17.38%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
(2) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 17.38%
(3) FDH G&A OF 16.19% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
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MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY CONSTRUCTION FORCES.

B.) ALL CASING DISPOSED OF AS RAD MIXED WASTE. CUT CASING TO FIT IN WOOD BURIAL BOXES.

C.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	2953104	520632	3473736	4.99	173339	3647075	30	1094122	4741198
121100	ENGINEERING DURING CONSTRUCTION	2003892	353286	2357178	4.99	117623	2474801	30	742440	3217241
TOTAL 000	ENGINEERING	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
460	IMPROVEMENTS TO LAND									
310011	A-FARM REMOVE INNER CASE THEN GROUT	740775	554480	1295255	4.99	64633	1359888	30	407966	1767855
310021	AXFARM REMOVE INNER CASE THEN GROUT	489051	367224	856275	4.99	42728	899003	30	269701	1168704
310031	B-FARM REMOVE INNER CASE THEN GROUT	607613	453848	1061461	4.99	52966	1114428	30	334328	1448757
310041	BXFARM REMOVE INNER CASE THEN GROUT	889938	667528	1557466	4.99	77717	1635184	30	490555	2125739
310051	BYFARM REMOVE INNER CASE THEN GROUT	756101	567784	1323885	4.99	66061	1389947	30	416984	1806932
310061	C-FARM REMOVE INNER CASE THEN GROUT	811992	607346	1419338	4.99	70825	1490163	30	447049	1937212
310071	S-FARM REMOVE INNER CASE THEN GROUT	836736	628342	1465078	4.99	73107	1538185	30	461455	1999641
310081	SXFARM REMOVE INNER CASE THEN GROUT	1091246	819487	1910733	4.99	95345	2006079	30	601823	2607903
310091	T-FARM REMOVE INNER CASE THEN GROUT	1985812	1463402	3449214	4.99	172115	3621330	30	1086399	4707729
310101	TXFARM REMOVE INNER CASE THEN GROUT	1013580	760815	1774395	4.99	88542	1862937	30	558881	2421819
310111	TYFARM REMOVE INNER CASE THEN GROUT	322076	241819	563895	4.99	28138	592033	30	177610	769643
310121	U-FARM REMOVE INNER CASE THEN GROUT	766054	573935	1339989	4.99	66865	1406854	30	422056	1828911
TOTAL 460	IMPROVEMENTS TO LAND	10310974	7706017	18016991	4.99	899047	18916039	30	5674811	24590851
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	3090000	500271	3590271	4.99	179154	3769425	0	0	3769425
TOTAL 900	PROJECT SUPPORT	3090000	500271	3590271	4.99	179154	3769425	0	0	3769425
PROJECT TOTAL		18,357,970	9,080,207	27,438,177	4.99	1,369,165	28,807,342	26	7,511,374	36,318,717

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	4956996	873918	5830914	4.99	290962	6121877	30	1836563	7958440
	TOTAL ENGINEERING		873,918			290,962			1,836,563	
		4,956,996		5,830,914	4.99		6,121,877	30		7,958,440
CONSTRUCTION										
07	SITE IMPROVEMENTS	10310974	7706017	18016991	4.99	899047	18916039	30	5674811	24590851
99	OTHER COST AND FEES	3090000	500271	3590271	4.99	179154	3769425	0	0	3769425
	TOTAL CONSTRUCTION		8,206,288			1,078,202			5,674,811	
		13,400,974		21,607,262	4.99		22,685,465	25		28,360,277
	PROJECT TOTAL		9,080,207			1,369,165			7,511,374	
		18,357,970		27,438,177	4.99		28,807,342	26		36,318,717

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	2953104	0.00	0	7382	513249	520632
121100	ENGINEERING DURING CONSTRUCTION	2003892	0.00	0	5009	348276	353286
310011	A-FARM REMOVE INNER CASE THEN GROUT	740775	45.90	340015	52773	161691	554480
310021	AXFARM REMOVE INNER CASE THEN GROUT	489051	45.90	224474	36070	106679	367224
310031	B-FARM REMOVE INNER CASE THEN GROUT	607613	45.90	278894	42959	131995	453848
310041	BXFARM REMOVE INNER CASE THEN GROUT	889938	45.90	408481	64568	194478	667528
310051	BYFARM REMOVE INNER CASE THEN GROUT	756101	45.90	347050	55775	164959	567784
310061	C-FARM REMOVE INNER CASE THEN GROUT	811992	45.90	372704	58041	176601	607346
310071	S-FARM REMOVE INNER CASE THEN GROUT	836736	45.90	384061	61724	182555	628342
310081	SXFARM REMOVE INNER CASE THEN GROUT	1091246	45.90	500881	80505	238100	819487
310091	T-FARM REMOVE INNER CASE THEN GROUT	1985812	45.90	911487	116702	435212	1463402
310101	TXFARM REMOVE INNER CASE THEN GROUT	1013580	45.90	465233	74509	221072	760815
310111	TYFARM REMOVE INNER CASE THEN GROUT	322076	45.90	147832	23748	70237	241819
310121	U-FARM REMOVE INNER CASE THEN GROUT	766054	45.90	351618	55341	166975	573935
500000	OPERATING CONTRACTOR (CHG)	3090000	0.00	0	0	500271	500271
	PROJECT TOTAL	18,357,970		4,732,737	735,114	3,612,355	9,080,207

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCM1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

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BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN HOURS FOR ALL DRILL HOLE DECOMMISSIONING ALTERNATES THE SAME	000	33600 MHR	33600	2953104	0	0	0	0	0	2953104
SUBTOTAL	HOME OFFICE LABOR			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			33,600	2,953,104	0	0	0	0	0	2,953,104
TOTAL WBS 111100 DEFINITIVE DESIGN				33,600	2,953,104	0	0	0	0	0	2,953,104

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	E&I DURING CONSTRUCTION HOURS FOR ALL DRILL HOLE DECOMMISSIONING ALTERNATES THE SAME	000	22800 MHR	22800	2003892	0	0	0	0	0	2003892
SUBTOTAL	HOME OFFICE LABOR			22,800	2,003,892	0	0	0	0	0	2,003,892
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			22,800	2,003,892	0	0	0	0	0	2,003,892
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				22,800	2,003,892	0	0	0	0	0	2,003,892

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310011	A-FARM REMOVE INNER CASE THEN GROUT										
310011.07	SITE IMPROVEMENTS										
310011.0700002	********** 241-A FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	404 LF	0	0	0	0	0	0	0	0
310011.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	4 EA	256	9395	12000	120	0	0	0	21515
310011.0700006	3 LABORERS	460	4 EA	256	8187	0	0	0	0	0	8187
310011.0700008	1 TEAMSTER	460	4 EA	96	3775	0	0	0	0	0	3775
310011.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	404 LF	0	0	0	0	0	0	0	0
310011.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	404 LF	0	0	0	20200	0	0	0	20200
310011.0701002	********** 241-A FARM- PERF CASING & GROUT HOLE **********	460	53 EA	0	0	0	0	0	0	0	0
310011.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310011.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310011.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310011.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	6873 LF	4949	185736	137460	22681	0	0	0	345877
310011.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6873 LF	4949	155795	0	0	0	0	0	155795
310011.0701106	1 TEAMSTER	460	6873 LF	1650	62123	0	0	0	0	0	62123
SUBTOTAL	SITE IMPROVEMENTS			12,212		150,460		0		0	
					426,969		43,001		0		620,430
	CONSUMABLES 3.50 %						14943				14943
	GENERAL FOREMAN 3.00 %			366	12809						12809

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			2516	87955						87955
	SALES TAX 8.00 %						4635		0		4635
TOTAL	COST CODE 46007			15,094		150,460		0		0	
	WBS 310011 FDNW				527,733		62,580		0		740,774
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310011 A-FARM REMOVE INNER CASE THEN GROUT				15,094		150,460		0		0	
					527,733		62,580		0		740,774

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310021	AXFARM REMOVE INNER CASE THEN GROUT										
310021.07	SITE IMPROVEMENTS										
310021.0700002	********** 241-AX FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	0 LF	0	0	0	0	0	0	0	0
310021.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $.3/LF FOR BLADES CUT AND PULL INNER CASING	460	0 LF	0	0	0	0	0	0	0	0
310021.0700006	3 LABORERS	460	0 LF	0	0	0	0	0	0	0	0
310021.0700008	1 TEAMSTER	460	0 LF	0	0	0	0	0	0	0	0
310021.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	0 LF	0	0	0	0	0	0	0	0
310021.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	0 LF	0	0	0	0	0	0	0	0
310021.0701002	********** 241-AX FARM- PERF CASING AND GROUT HOLES **********	460	52 EA	0	0	0	0	0	0	0	0
310021.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310021.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310021.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310021.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	4936 LF	3554	133382	98720	16289	0	0	0	248391
310021.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4936 LF	3554	111880	0	0	0	0	0	111880
310021.0701106	1 TEAMSTER	460	4936 LF	1185	44615	0	0	0	0	0	44615
SUBTOTAL	SITE IMPROVEMENTS			8,349		99,720		0		0	
					291,835		16,289		0		407,844
	CONSUMABLES 3.50 %						10214				10214
	GENERAL FOREMAN 3.00 %			250	8755						8755

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			1720	60118						60118
	SALES TAX 8.00 %						2120		0		2120
TOTAL	COST CODE 46007			10,319		99,720		0		0	
	WBS 310021 FDNW				360,708		28,623		0		489,051
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021 AXFARM REMOVE INNER CASE THEN GROUT				10,319		99,720		0		0	
					360,708		28,623		0		489,051

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310031	B-FARM REMOVE INNER CASE THEN GROUT										
310031.07	SITE IMPROVEMENTS										
310031.0700002	********** 241-B FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	350 LF	0	0	0	0	0	0	0	0
310031.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	7 EA	448	16813	21000	210	0	0	0	38023
310031.0700006	3 LABORERS	460	7 EA	448	14103	0	0	0	0	0	14103
310031.0700008	1 TEAMSTER	460	7 EA	168	6325	0	0	0	0	0	6325
310031.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	350 LF	0	0	0	0	0	0	0	0
310031.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	350 LF	0	0	0	17500	0	0	0	17500
310031.0701002	********** 241-B FARM- PERF CASING AND GROUT HOLES **********	460	48 EA	0	0	0	0	0	0	0	0
310031.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310031.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310031.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310031.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	5252 LF	3781	141901	105040	17332	0	0	0	264273
310031.0701104	ASSUME SINGLE CASING 3 LABORERS	460	5252 LF	3781	119026	0	0	0	0	0	119026
310031.0701106	1 TEAMSTER	460	5252 LF	1260	47439	0	0	0	0	0	47439
SUBTOTAL	SITE IMPROVEMENTS			9,942		127,040		0		0	
					347,565		35,042		0		509,647
	CONSUMABLES 3.50 %						12164				12164
	GENERAL FOREMAN 3.00 %			298	10426						10426

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			2048	71598						71598
	SALES TAX 8.00 %						3776		0		3776
TOTAL	COST CODE 46007			12,288		127,040		0		0	
	WBS 310031 FDNW				429,590		50,983		0		607,613
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310031 B-FARM REMOVE INNER CASE THEN GROUT				12,288		127,040		0		0	
					429,590		50,983		0		607,613

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BXFARM REMOVE INNER CASE THEN GROUT										
310041.07	SITE IMPROVEMENTS										
310041.0700002	********** 241-BX FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	255 LF	0	0	0	0	0	0	0	0
310041.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	1 EA	64	2402	3000	30	0	0	0	5432
310041.0700006	3 LABORERS	460	1 EA	64	2015	0	0	0	0	0	2015
310041.0700008	1 TEAMSTER	460	1 EA	24	904	0	0	0	0	0	904
310041.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	255 LF	0	0	0	0	0	0	0	0
310041.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	255 LF	0	0	0	12750	0	0	0	12750
310041.0701002	********** 241-BX FARM- PERF CASING AND GROUT HOLES **********	460	82 EA	0	0	0	0	0	0	0	0
310041.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310041.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310041.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310041.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	8772 LF	6316	237039	175440	28948	0	0	0	441427
310041.0701104	ASSUME SINGLE CASING 3 LABORERS	460	8772 LF	6316	198828	0	0	0	0	0	198828
310041.0701106	1 TEAMSTER	460	8772 LF	2105	79253	0	0	0	0	0	79253
SUBTOTAL	SITE IMPROVEMENTS			14,945		179,440		0		0	
					522,399		41,728		0		743,567
	CONSUMABLES 3.50 %						18283				18283
	GENERAL FOREMAN 3.00 %			448	15671						15671

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			3079	107614						107614
	SALES TAX 8.00 %						4800		0		4800
TOTAL	COST CODE 46007			18,472		179,440		0		0	
	WBS 310041 FDNW				645,685		64,812		0		889,938
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310041 BXFARM REMOVE INNER CASE THEN GROUT				18,472		179,440		0		0	
					645,685		64,812		0		889,938

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310051	BYFARM REMOVE INNER CASE THEN GROUT										
310051.07	SITE IMPROVEMENTS										
310051.0700002	********** 241-BY FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	0 LF	0	0	0	0	0	0	0	0
310051.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/LF FOR BLADES CUT AND PULL INNER CASING	460	0 EA	0	0	0	0	0	0	0	0
310051.0700006	3 LABORERS	460	0 LF	0	0	0	0	0	0	0	0
310051.0700008	1 TEAMSTER	460	0 LF	0	0	0	0	0	0	0	0
310051.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	0 LF	0	0	0	0	0	0	0	0
310051.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	0 LF	0	0	0	0	0	0	0	0
310051.0701002	********** 241-BY FARM- PERF CASING AND GROUT HOLES **********	460	71 EA	0	0	0	0	0	0	0	0
310051.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310051.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310051.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310051.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	7651 LF	5509	206753	153020	25248	0	0	0	385021
310051.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7651 LF	5509	173423	0	0	0	0	0	173423
310051.0701106	1 TEAMSTER	460	7651 LF	1836	69125	0	0	0	0	0	69125
SUBTOTAL	SITE IMPROVEMENTS			12,910	451,259	154,020	25,248	0	0	0	630,527
	CONSUMABLES 3.50 %						15794				15794
	GENERAL FOREMAN 3.00 %			387	13537						13537

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			2659	92959						92959
	SALES TAX 8.00 %						3283		0		3283
TOTAL	COST CODE 46007			15,956		154,020		0		0	
	WBS 310051 FDNW				557,756		44,325		0		756,101
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310051 BYFARM REMOVE INNER CASE THEN GROUT				15,956		154,020		0		0	
					557,756		44,325		0		756,101

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310061	C-FARM REMOVE INNER CASE THEN GROUT										
310061.07	SITE IMPROVEMENTS										
310061.0700002	********** 241-C FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	350 LF	0	0	0	0	0	0	0	0
310061.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	7 EA	448	16813	21000	210	0	0	0	38023
310061.0700006	3 LABORERS	460	7 EA	448	14103	0	0	0	0	0	14103
310061.0700008	1 TEAMSTER	460	7 EA	168	6325	0	0	0	0	0	6325
310061.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	350 LF	0	0	0	0	0	0	0	0
310061.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	350 LF	0	0	0	17500	0	0	0	17500
310061.0701002	********** 241-C FARM- PERF CASING AND GROUT HOLES **********	460	70 EA	0	0	0	0	0	0	0	0
310061.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310061.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310061.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310061.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	7329 LF	5277	198046	146580	24186	0	0	0	368812
310061.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7329 LF	5277	166120	0	0	0	0	0	166120
310061.0701106	1 TEAMSTER	460	7329 LF	1759	66226	0	0	0	0	0	66226
SUBTOTAL	SITE IMPROVEMENTS			13,433		168,580		0		0	
					469,591		41,896		0		680,067
	CONSUMABLES 3.50 %						16435				16435
	GENERAL FOREMAN 3.00 %			403	14087						14087

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			2767	96735						96735
	SALES TAX 8.00 %						4666		0		4666
TOTAL	COST CODE 46007			16,603		168,580		0		0	
	WBS 310061 FDNW				580,414		62,998		0		811,992
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM REMOVE INNER CASE THEN GROUT				16,603		168,580		0		0	
					580,414		62,998		0		811,992

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310071	S-FARM REMOVE INNER CASE THEN GROUT										
310071.07	SITE IMPROVEMENTS										
310071.0700002	********** 241-S FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	0 LF	0	0	0	0	0	0	0	0
310071.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	0 EA	0	0	0	0	0	0	0	0
310071.0700006	3 LABORERS	460	0 EA	0	0	0	0	0	0	0	0
310071.0700008	1 TEAMSTER	460	0 EA	0	0	0	0	0	0	0	0
310071.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	0 LF	0	0	0	0	0	0	0	0
310071.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	0 LF	0	0	0	0	0	0	0	0
310071.0701002	********** 241-S FARM- PERF CASING AND GROUT HOLES **********	460	73 EA	0	0	0	0	0	0	0	0
310071.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310071.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310071.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310071.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	8471 LF	6099	228895	169420	27954	0	0	0	426269
310071.0701104	ASSUME SINGLE CASING 3 LABORERS	460	8471 LF	6099	191997	0	0	0	0	0	191997
310071.0701106	1 TEAMSTER	460	8471 LF	2033	76542	0	0	0	0	0	76542
SUBTOTAL	SITE IMPROVEMENTS			14,287	170,420			0		0	
				499,392			27,954		0		697,766
	CONSUMABLES 3.50 %						17478				17478
	GENERAL FOREMAN 3.00 %			429	14981						14981

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			2943	102874						102874
	SALES TAX 8.00 %						3634		0		3634
TOTAL	COST CODE 46007			17,658		170,420		0		0	
	WBS 310071 FDNW				617,248		49,067		0		836,735
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310071 S-FARM REMOVE INNER CASE THEN GROUT				17,658		170,420		0		0	
					617,248		49,067		0		836,735

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	SXFARM REMOVE INNER CASE THEN GROUT										
310081.07	SITE IMPROVEMENTS										
310081.0700002	********** 241-SX FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	0 LF	0	0	0	0	0	0	0	0
310081.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	0 EA	0	0	0	0	0	0	0	0
310081.0700006	3 LABORERS	460	0 EA	0	0	0	0	0	0	0	0
310081.0700008	1 TEAMSTER	460	0 EA	0	0	0	0	0	0	0	0
310081.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	0 LF	0	0	0	0	0	0	0	0
310081.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	0 LF	0	0	0	0	0	0	0	0
310081.0701002	********** 241-SX FARM- PERF CASING AND GROUT HOLES **********	460	105 EA	0	0	0	0	0	0	0	0
310081.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310081.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310081.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310081.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	11058 LF	7962	298814	221160	36491	0	0	0	556465
310081.0701104	ASSUME SINGLE CASING 3 LABORERS	460	11058 LF	7962	250644	0	0	0	0	0	250644
310081.0701106	1 TEAMSTER	460	11058 LF	2654	99923	0	0	0	0	0	99923
SUBTOTAL	SITE IMPROVEMENTS			18,634	651,339	222,160	36,491	0	0	0	909,990
	CONSUMABLES 3.50 %						22796				22796
	GENERAL FOREMAN 3.00 %			559	19540						19540

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			3839	134175						134175
	SALES TAX 8.00 %						4743		0		4743
TOTAL	COST CODE 46007			23,031		222,160		0		0	
	WBS 310081 FDNW				805,055		64,030		0		1,091,245
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081 SXFARM REMOVE INNER CASE THEN GROUT				23,031		222,160		0		0	
					805,055		64,030		0		1,091,245

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310091	T-FARM REMOVE INNER CASE THEN GROUT										
310091.07	SITE IMPROVEMENTS										
310091.0700002	********** 241-T FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	6484 LF	0	0	0	0	0	0	0	0
310091.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	60 EA	3840	144115	180000	1800	0	0	0	325915
310091.0700006	3 LABORERS	460	60 EA	3840	120883	0	0	0	0	0	120883
310091.0700008	1 TEAMSTER	460	60 EA	1440	54216	0	0	0	0	0	54216
310091.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	6484 LF	0	0	0	0	0	0	0	0
310091.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	6484 LF	0	0	0	324200	0	0	0	324200
310091.0701002	********** 241-T FARM- PERF CASING AND GROUT HOLES **********	460	95 EA	0	0	0	0	0	0	0	0
310091.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310091.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310091.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310091.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	10610 LF	7639	286692	212200	35013	0	0	0	533905
310091.0701104	ASSUME SINGLE CASING 3 LABORERS	460	10610 LF	7639	240476	0	0	0	0	0	240476
310091.0701106	1 TEAMSTER	460	10610 LF	2546	95857	0	0	0	0	0	95857
SUBTOTAL	SITE IMPROVEMENTS			27,000	944,197	393,200	361,013	0	0	0	1,698,410
	CONSUMABLES 3.50 %						33046				33046
	GENERAL FOREMAN 3.00 %			810	28325						28325

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			5562	194504						194504
	SALES TAX 8.00 %						31524		0		31524
TOTAL	COST CODE 46007			33,372		393,200		0		0	
	WBS 310091 FDNW				1,167,027		425,584		0		1,985,812
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091 T-FARM REMOVE INNER CASE THEN GROUT				33,372		393,200		0		0	
					1,167,027		425,584		0		1,985,812

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310101	TXFARM REMOVE INNER CASE THEN GROUT										
310101.07	SITE IMPROVEMENTS										
310101.0700002	********** 241-TX FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	50 LF	0	0	0	0	0	0	0	0
310101.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	1 EA	64	2402	3000	30	0	0	0	5432
310101.0700006	3 LABORERS	460	1 EA	64	2015	0	0	0	0	0	2015
310101.0700008	1 TEAMSTER	460	1 EA	24	904	0	0	0	0	0	904
310101.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	50 LF	0	0	0	0	0	0	0	0
310101.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	50 LF	0	0	0	2500	0	0	0	2500
310101.0701002	********** 241-TX FARM- PERF CASING AND GROUT HOLES **********	460	102 EA	0	0	0	0	0	0	0	0
310101.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310101.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310101.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310101.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	10141 LF	7302	274044	202820	33465	0	0	0	510329
310101.0701104	ASSUME SINGLE CASING 3 LABORERS	460	10141 LF	7302	229867	0	0	0	0	0	229867
310101.0701106	1 TEAMSTER	460	10141 LF	2434	91640	0	0	0	0	0	91640
SUBTOTAL	SITE IMPROVEMENTS			17,246	602,830	206,820	35,995	0	0	0	845,645
	CONSUMABLES 3.50 %						21099				21099
	GENERAL FOREMAN 3.00 %			517	18084						18084

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			3553	124182						124182
	SALES TAX 8.00 %						4567		0		4567
TOTAL	COST CODE 46007			21,316		206,820		0		0	
	WBS 310101 FDNW				745,097		61,661		0		1,013,579
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310101 TXFARM REMOVE INNER CASE THEN GROUT				21,316		206,820		0		0	
					745,097		61,661		0		1,013,579

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310111	TYFARM REMOVE INNER CASE THEN GROUT										
310111.07	SITE IMPROVEMENTS										
310111.0700002	********** 241-TY FARM-CUT INNER CASING AND REMOVE INNER CASING **********	460	0 LF	0	0	0	0	0	0	0	0
310111.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/EA FOR BLADES CUT AND PULL INNER CASING	460	0 EA	0	0	0	0	0	0	0	0
310111.0700006	3 LABORERS	460	0 EA	0	0	0	0	0	0	0	0
310111.0700008	1 TEAMSTER	460	0 EA	0	0	0	0	0	0	0	0
310111.0700010	********** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	0 LF	0	0	0	0	0	0	0	0
310111.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING **********	460	0 LF	0	0	0	0	0	0	0	0
310111.0701002	********** 241-TY FARM- PERF CASING AND GROUT HOLES **********	460	31 EA	0	0	0	0	0	0	0	0
310111.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310111.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310111.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310111.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	3239 LF	2332	87520	64780	10689	0	0	0	162989
310111.0701104	ASSUME SINGLE CASING 3 LABORERS	460	3239 LF	2332	73411	0	0	0	0	0	73411
310111.0701106	1 TEAMSTER	460	3239 LF	777	29254	0	0	0	0	0	29254
SUBTOTAL	SITE IMPROVEMENTS			5,497		65,780		0		0	
					192,143		10,689		0		268,612
	CONSUMABLES 3.50 %						6725				6725
	GENERAL FOREMAN 3.00 %			165	5764						5764

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			1132	39581						39581
	SALES TAX 8.00 %						1393		0		1393
TOTAL	COST CODE 46007			6,794		65,780		0		0	
	WBS 310111 FDNW				237,488		18,807		0		322,075
	(ESCALATION 4.99% - CONTINGENCY		30.00 %)								
TOTAL WBS 310111 TYFARM REMOVE INNER CASE THEN GROUT				6,794		65,780		0		0	
					237,488		18,807		0		322,075

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM REMOVE INNER CASE THEN GROUT										
310121.07	SITE IMPROVEMENTS										
310121.0700002	**********	460	250 LF	0	0	0	0	0	0	0	0
	241-U FARM-CUT INNER CASING AND REMOVE INNER CASING										
	**********										
310121.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME $30/LF FOR BLADES CUT AND PULL INNER CASING	460	5 EA	320	12010	15000	150	0	0	0	27160
310121.0700006	3 LABORERS	460	5 EA	320	10074	0	0	0	0	0	10074
310121.0700008	1 TEAMSTER	460	5 EA	120	4518	0	0	0	0	0	4518
310121.0700010	**********	460	250 LF	0	0	0	0	0	0	0	0
	ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.										
310121.0700012	$70/CF DISPOSAL x 64 CF= $4480. ASSUME $520 FOR COST OF BURIAL BOX AND SHIPPING	460	250 LF	0	0	0	12500	0	0	0	12500
	**********										
310121.0701002	**********	460	60 EA	0	0	0	0	0	0	0	0
	241-U FARM- PERF CASING AND GROUT HOLES										
	**********										
310121.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	0	0	1901
310121.0701006	3 LABORER	460	1 LS	24	756	0	0	0	0	0	756
310121.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310121.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6" ASSUME $.3/LF FOR BLADES ASSUME GROUT 3 CY/100LF	460	7047 LF	5074	190427	140940	23255	0	0	0	354622
310121.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7047 LF	5074	162267	0	0	0	0	0	162267
310121.0701106	1 TEAMSTER	460	7047 LF	1691	66490	0	0	0	0	0	66490
SUBTOTAL	SITE IMPROVEMENTS			12,655		156,940		0		0	
					447,744		35,905		0		640,589
	CONSUMABLES 3.50 %						15671				15671
	GENERAL FOREMAN 3.00 %			380	13432						13432

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			2607	92235						92235
	SALES TAX 8.00 %						4126		0		4126
TOTAL	COST CODE 46007			15,641		156,940		0		0	
	WBS 310121 FDNW				553,411		55,702		0		766,053
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121 U-FARM REMOVE INNER CASE THEN GROUT				15,641		156,940		0		0	
					553,411		55,702		0		766,053

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION LABOR COSTS.	900	1 LS	0	0	0	0	3090000	0	0	3090000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	3,090,000	0	0	3,090,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 0.00 %)			0	0	0	0	3,090,000	0	0	3,090,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	3,090,000	0	0	3,090,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				262,947	2,094,580			3,090,000			0
					12,184,213		989,177			0	18,357,970

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	1,903,000	30	571,000	2,474,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	1,671,000	30	501,000	2,172,000
TOTAL ESTIMATED COST (TEC)		3,574,000	30	1,072,000	4,646,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	279,000	30	84,000	363,000
TOTAL OTHER PROJECT COSTS (OPC)		279,000	30	84,000	363,000
TOTAL PROJECT COST (TPC)		3,853,000	30	1,156,000	5,009,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/12/00

LEAD ESTIMATOR: DL GUNDERSON — ESTIMATING MANAGER: FC DAY

PROJECT MANAGER:

CLIENT:

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	1281436	225917	1507353	4.99	75216	1582570	30	474771	2057341
SUBTOTAL 11	DEFINITIVE DESIGN	1281436	225917	1507353	4.99	75216	1582570	30	474771	2057341
121100	ENGINEERING DURING CONSTRUCTION	259276	45710	304986	4.99	15218	320205	30	96061	416266
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	259276	45710	304986	4.99	15218	320205	30	96061	416266
310011	A-FARM EXTEND CASING AND GROUT PAD	48286	52480	100766	4.99	5028	105794	30	31738	137532
310021	AX-FARM EXTEND CASING AND GROUT PAD	52470	57175	109645	4.99	5471	115116	30	34534	149651
310031	B-FARM EXTEND CASING AND GROUT PAD	43713	47506	91219	4.99	4551	95771	30	28731	124503
310041	BX-FARM EXTEND CASING AND GROUT PAD	73337	79681	153018	4.99	7635	160654	30	48196	208850
310051	BY-FARM EXTEND CASING AND GROUT PAD	63751	69270	133021	4.99	6637	139659	30	41897	181556
310061	C-FARM EXTEND CASING AND GROUT PAD	62883	68327	131210	4.99	6547	137757	30	41327	179085
310071	S-FARM EXTEND CASING AND GROUT PAD	66024	71754	137778	4.99	6875	144653	30	43396	188050
310081	SX-FARM EXTEND CASING AND GROUT PAD	93907	102038	195945	4.99	9777	205723	30	61717	267440
310091	T-FARM EXTEND CASING AND GROUT PAD	84664	91984	176648	4.99	8814	185462	30	55638	241101
310101	TX-FARM EXTEND CASING AND GROUT PAD	90763	98608	189371	4.99	9449	198821	30	59646	258467
310111	TY-FARM EXTEND CASING AND GROUT PAD	28900	31418	60318	4.99	3009	63327	30	18998	82326
310121	U-FARM EXTEND CASING AND GROUT PAD	54168	58862	113030	4.99	5640	118670	30	35601	154271
SUBTOTAL 31	CONSTRUCTION FORCES	762866	829108	1591974	4.99	79439	1671413	30	501424	2172837
500000	OPERATING CONTRACTOR (CHG)	228900	37058	265958	4.99	13271	279230	30	83769	362999
PROJECT TOTAL		2,532,478	1,137,794	3,670,272	4.99	183,146	3,853,419	30	1,156,025	5,009,445

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(2) A FACTOR OF 45.9% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS.
(3) CONSUMABLES ARE ESTIMATED AT 3.5% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 3% HAS BEEN APPLIED TO DIRECT CRAFT LABOR.
(6) A FACTOR OF 10% HAS BEEN APPLIED TO DIRECT CRAFT LABOR AND 0.25% TO ENGINEERING TO ALLOW FOR USAGE OF GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNCORP.

C. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR FEDERAL SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR FEDERAL SERVICES COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMANS COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE AND G&A/FEE TO DEVELOP A FULLY BURDENED RATE BY CRAFT.

D. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) FDH GFS/G&A CONST. MGT. RATE (17.38%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
(2) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (17.38%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR. 17.38%
(3) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY CONSTRUCTION FORCES.

B.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	1281436	225917	1507353	4.99	75216	1582570	30	474771	2057341
121100	ENGINEERING DURING CONSTRUCTION	259276	45710	304986	4.99	15218	320205	30	96061	416266
TOTAL 000	ENGINEERING	1540712	271627	1812339	4.99	90435	1902775	30	570832	2473607
460	IMPROVEMENTS TO LAND									
310011	A-FARM EXTEND CASING AND GROUT PAD	48286	52480	100766	4.99	5028	105794	30	31738	137532
310021	AX-FARM EXTEND CASING AND GROUT PAD	52470	57175	109645	4.99	5471	115116	30	34534	149651
310031	B-FARM EXTEND CASING AND GROUT PAD	43713	47506	91219	4.99	4551	95771	30	28731	124503
310041	BX-FARM EXTEND CASING AND GROUT PAD	73337	79681	153018	4.99	7635	160654	30	48196	208850
310051	BY-FARM EXTEND CASING AND GROUT PAD	63751	69270	133021	4.99	6637	139659	30	41897	181556
310061	C-FARM EXTEND CASING AND GROUT PAD	62883	68327	131210	4.99	6547	137757	30	41327	179085
310071	S-FARM EXTEND CASING AND GROUT PAD	66024	71754	137778	4.99	6875	144653	30	43396	188050
310081	SX-FARM EXTEND CASING AND GROUT PAD	93907	102038	195945	4.99	9777	205723	30	61717	267440
310091	T-FARM EXTEND CASING AND GROUT PAD	84664	91984	176648	4.99	8814	185462	30	55638	241101
310101	TX-FARM EXTEND CASING AND GROUT PAD	90763	98608	189371	4.99	9449	198821	30	59646	258467
310111	TY-FARM EXTEND CASING AND GROUT PAD	28900	31418	60318	4.99	3009	63327	30	18998	82326
310121	U-FARM EXTEND CASING AND GROUT PAD	54168	58862	113030	4.99	5640	118670	30	35601	154271
TOTAL 460	IMPROVEMENTS TO LAND	762866	829108	1591974	4.99	79439	1671413	30	501424	2172837
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	228900	37058	265958	4.99	13271	279230	30	83769	362999
TOTAL 900	PROJECT SUPPORT	228900	37058	265958	4.99	13271	279230	30	83769	362999
PROJECT TOTAL		2,532,478	1,137,794	3,670,272	4.99	183,146	3,853,419	30	1,156,025	5,009,445

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	1540712	271627	1812339	4.99	90435	1902775	30	570832	2473607
	TOTAL ENGINEERING		271,627			90,435			570,832	
		1,540,712		1,812,339	4.99		1,902,775	30		2,473,607
CONSTRUCTION										
07	SITE IMPROVEMENTS	762866	829108	1591974	4.99	79439	1671413	30	501424	2172837
99	OTHER COST AND FEES	228900	37058	265958	4.99	13271	279230	30	83769	362999
	TOTAL CONSTRUCTION		866,167			92,710			585,193	
		991,766		1,857,933	4.99		1,950,644	30		2,535,837
	PROJECT TOTAL		1,137,794			183,146			1,156,025	
		2,532,478		3,670,272	4.99		3,853,419	30		5,009,445

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	1281436	0.00	0	3203	222713	225917
121100	ENGINEERING DURING CONSTRUCTION	259276	0.00	0	648	45062	45710
310011	A-FARM EXTEND CASING AND GROUT PAD	48286	72.00	34765	3647	14067	52480
310021	AX-FARM EXTEND CASING AND GROUT PAD	52470	72.00	37778	4072	15324	57175
310031	B-FARM EXTEND CASING AND GROUT PAD	43713	72.00	31473	3300	12733	47506
310041	BX-FARM EXTEND CASING AND GROUT PAD	73337	72.00	52802	5515	21364	79681
310051	BY-FARM EXTEND CASING AND GROUT PAD	63751	72.00	45900	4798	18571	69270
310061	C-FARM EXTEND CASING AND GROUT PAD	62883	72.00	45275	4733	18318	68327
310071	S-FARM EXTEND CASING AND GROUT PAD	66024	72.00	47537	4980	19237	71754
310081	SX-FARM EXTEND CASING AND GROUT PAD	93907	72.00	67613	7064	27361	102038
310091	T-FARM EXTEND CASING AND GROUT PAD	84664	72.00	60958	6361	24664	91984
310101	TX-FARM EXTEND CASING AND GROUT PAD	90763	72.00	65349	6817	26441	98608
310111	TY-FARM EXTEND CASING AND GROUT PAD	28900	72.00	20808	2192	8417	31418
310121	U-FARM EXTEND CASING AND GROUT PAD	54168	72.00	39000	4082	15779	58862
500000	OPERATING CONTRACTOR (CHG)	228900	0.00	0	0	37058	37058
	PROJECT TOTAL	2,532,478		549,263	61,417	527,113	1,137,794

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 168% OF TOTAL CONSTRUCTION COSTS OF APPROX $763,000	000	14580 MHR	14580	1281436	0	0	0	0	0	1281436
SUBTOTAL	HOME OFFICE LABOR			14,580	1,281,436	0	0	0	0	0	1,281,436
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			14,580	1,281,436	0	0	0	0	0	1,281,436
TOTAL WBS 111100 DEFINITIVE DESIGN				14,580	1,281,436	0	0	0	0	0	1,281,436

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	E & I DURING CONSTRUCTION 34% OF TOTAL CONSTRUCTION COSTS OF APPROX $763,000	000	2950 MHR	2950	259276	0	0	0	0	0	259276
SUBTOTAL	HOME OFFICE LABOR			2,950	259,276	0	0	0	0	0	259,276
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			2,950	259,276	0	0	0	0	0	259,276
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				2,950	259,276	0	0	0	0	0	259,276

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310011	A-FARM EXTEND CASING AND GROUT PAD										
310011.07	SITE IMPROVEMENTS										
310011.0701002	********** 241-A FARM- EXTEND CASING & GROUT PAD **********	460	53 EA	0	0	0	0	0	0	0	0
310011.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	587	100	0	0	0	0	687
310011.0701006	2 LABORER	460	1 LS	16	512	0	0	0	0	0	512
310011.0701008	1 TEAMSTER **********	460	1 LS	8	315	0	0	0	0	0	315
310011.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	53 EA	318	11671	2014	7950	0	0	0	21635
310011.0701104	2 LABORERS	460	53 EA	318	10170	0	0	0	0	0	10170
310011.0701106	1 TEAMSTER	460	53 EA	159	6252	0	0	0	0	0	6252
SUBTOTAL	SITE IMPROVEMENTS			835		2,114		0		0	
					29,507		7,950		0		39,571
	CONSUMABLES 3.50 %						1032				1032
	GENERAL FOREMAN 3.00 %			25	885						885
	GENERAL REQUIREMENTS 20.00 %			172	6078						6078
	SALES TAX 8.00 %						718		0		718
TOTAL	COST CODE 46007			1,032		2,114		0		0	
	WBS 310011 FDNW				36,470		9,701		0		48,286
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310011 A-FARM EXTEND CASING AND GROUT PAD				1,032		2,114		0		0	
					36,470		9,701		0		48,286

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310021	AX-FARM EXTEND CASING AND GROUT PAD										
310021.07	SITE IMPROVEMENTS										
310021.0701002	********** 241-AX FARM- EXTEND CASING & GROUT PAD **********	460	52 EA	0	0	0	0	0	0	0	0
310021.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	587	100	0	0	0	0	687
310021.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310021.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310021.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	52 EA	312	11709	1976	7800	0	0	0	21485
310021.0701104	2 LABORERS	460	52 EA	312	9822	0	0	0	0	0	9822
310021.0701106	1 TEAMSTER	460	52 EA	156	5873	0	0	0	0	0	5873
310021.0701108	3 LABORERS- LOCATE WELLS CUTOFF BELOW GRADE AND CAPPED	460	10 EA	120	3778	0	0	0	0	0	3778
310021.0701110	2 OPERATORS- CUTOFF WELL CAPS FOR EXTENSION	460	10 EA	10	375	0	0	0	0	0	375
SUBTOTAL	SITE IMPROVEMENTS			950		2,076		0		0	
					32,949		7,800		0		42,825
	CONSUMABLES 3.50 %						1153				1153
	GENERAL FOREMAN 3.00 %			29	988						988
	GENERAL REQUIREMENTS 20.00 %			196	6787						6787
	SALES TAX 8.00 %						716		0		716
TOTAL	COST CODE 46007			1,174		2,076		0		0	
	WBS 310021 FDNW				40,724		9,669		0		52,470
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021 AX-FARM EXTEND CASING AND GROUT PAD				1,174		2,076		0		0	
					40,724		9,669		0		52,470

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310031	B-FARM EXTEND CASING AND GROUT PAD										
310031.07	SITE IMPROVEMENTS										
310031.0701002	********** 241-B FARM- EXTEND CASING & GROUT PAD **********	460	48 EA	0	0	0	0	0	0	0	0
310031.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310031.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310031.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310031.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER, ASSUME 3 HOURS/WELL	460	48 EA	288	10809	1824	7200	0	0	0	19833
310031.0701104	2 LABORERS	460	48 EA	288	9066	0	0	0	0	0	9066
310031.0701106	1 TEAMSTER	460	48 EA	144	5422	0	0	0	0	0	5422
SUBTOTAL	SITE IMPROVEMENTS			760		1,924		0		0	
					26,702		7,200		0		35,826
	CONSUMABLES 3.50 %						934				934
	GENERAL FOREMAN 3.00 %			23	801						801
	GENERAL REQUIREMENTS 20.00 %			157	5500						5500
	SALES TAX 8.00 %						650		0		650
TOTAL	COST CODE 46007			939		1,924		0		0	
	WBS 310031 FDNW				33,003		8,785		0		43,713
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310031 B-FARM EXTEND CASING AND GROUT PAD				939		1,924		0		0	
					33,003		8,785		0		43,713

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BX-FARM EXTEND CASING AND GROUT PAD										
310041.07	SITE IMPROVEMENTS										
310041.0701002	********** 241-BX FARM- EXTEND CASING & GROUT PAD **********	460	82 EA	0	0	0	0	0	0	0	0
310041.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310041.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310041.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310041.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	82 EA	492	18465	3116	12300	0	0	0	33881
310041.0701104	2 LABORERS	460	82 EA	492	15488	0	0	0	0	0	15488
310041.0701106	1 TEAMSTER	460	82 EA	246	9262	0	0	0	0	0	9262
SUBTOTAL	SITE IMPROVEMENTS			1,270		3,216		0		0	
					44,620		12,300		0		60,136
	CONSUMABLES 3.50 %						1561				1561
	GENERAL FOREMAN 3.00 %			38	1338						1338
	GENERAL REQUIREMENTS 20.00 %			262	9191						9191
	SALES TAX 8.00 %						1108		0		1108
TOTAL	COST CODE 46007			1,569		3,216		0		0	
	WBS 310041 FDNW				55,150		14,970		0		73,336
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310041 BX-FARM EXTEND CASING AND GROUT PAD				1,569		3,216		0		0	
					55,150		14,970		0		73,336

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310051	BY-FARM EXTEND CASING AND GROUT PAD										
310051.07	SITE IMPROVEMENTS										
310051.0701002	********** 241-BY FARM- EXTEND CASING & GROUT PAD **********	460	71 EA	0	0	0	0	0	0	0	0
310051.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310051.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310051.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310051.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	71 EA	426	15988	2698	10650	0	0	0	29336
310051.0701104	2 LABORERS	460	71 EA	426	13410	0	0	0	0	0	13410
310051.0701106	1 TEAMSTER	460	71 EA	213	8019	0	0	0	0	0	8019
SUBTOTAL	SITE IMPROVEMENTS			1,105		2,798		0		0	
					38,822		10,650		0		52,270
	CONSUMABLES 3.50 %						1358				1358
	GENERAL FOREMAN 3.00 %			33	1164						1164
	GENERAL REQUIREMENTS 20.00 %			228	7997						7997
	SALES TAX 8.00 %						960		0		960
TOTAL	COST CODE 46007			1,365		2,798		0		0	
	WBS 310051 FDNW				47,983		12,969		0		63,751
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310051 BY-FARM EXTEND CASING AND GROUT PAD				1,365		2,798		0		0	
					47,983		12,969		0		63,751

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310061	C-FARM EXTEND CASING AND GROUT PAD										
310061.07	SITE IMPROVEMENTS										
310061.0701002	********** 241-C FARM- EXTEND CASING & GROUT PAD **********	460	70 EA	0	0	0	0	0	0	0	0
310061.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310061.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310061.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
310061.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	70 EA	420	15763	2660	10500	0	0	0	28923
310061.0701104	2 LABORERS	460	70 EA	420	13222	0	0	0	0	0	13222
310061.0701106	1 TEAMSTER	460	70 EA	210	7907	0	0	0	0	0	7907
SUBTOTAL	SITE IMPROVEMENTS			1,090	38,297	2,760	10,500	0	0	0	51,557
	CONSUMABLES 3.50 %						1340				1340
	GENERAL FOREMAN 3.00 %			33	1148						1148
	GENERAL REQUIREMENTS 20.00 %			225	7889						7889
	SALES TAX 8.00 %						947		0		947
TOTAL	COST CODE 46007 WBS 310061 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			1,347	47,335	2,760	12,787	0	0	0	62,882
TOTAL WBS 310061 C-FARM EXTEND CASING AND GROUT PAD				1,347	47,335	2,760	12,787	0	0	0	62,882

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310071	S-FARM EXTEND CASING AND GROUT PAD										
310071.07	SITE IMPROVEMENTS										
310071.0701002	********** 241-S FARM- EXTEND CASING & GROUT PAD **********	460	73 EA	0	0	0	0	0	0	0	0
310071.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310071.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310071.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310071.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	73 EA	438	16438	2774	10950	0	0	0	30162
310071.0701104	2 LABORERS	460	73 EA	438	13788	0	0	0	0	0	13788
310071.0701106	1 TEAMSTER	460	73 EA	219	8245	0	0	0	0	0	8245
310071.0701108	3 LABORERS-LOCATE WELLS CUTOFF BELOW GRADE AND EXCAVATE	460	1 EA	12	378	0	0	0	0	0	378
310071.0701110	2 OPERATORS- CUTOFF CAPS ON WELLS BELOW GRADE FOR EXTENSION	460	1 EA	1	38	0	0	0	0	0	38
SUBTOTAL	SITE IMPROVEMENTS			1,148		2,874		0		0	
					40,292		10,950		0		54,116
	CONSUMABLES 3.50 %						1410				1410
	GENERAL FOREMAN 3.00 %			34	1208						1208
	GENERAL REQUIREMENTS 20.00 %			236	8300						8300
	SALES TAX 8.00 %						988		0		988
TOTAL	COST CODE 46007			1,418		2,874		0		0	
	WBS 310071 FDNW				49,800		13,349		0		66,023
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310071 S-FARM EXTEND CASING AND GROUT PAD				1,418		2,874		0		0	
					49,800		13,349		0		66,023

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	SX-FARM EXTEND CASING AND GROUT PAD										
310081.07	SITE IMPROVEMENTS										
310081.0701002	**********	460	105 EA	0	0	0	0	0	0	0	0
	241-SX FARM- EXTEND CASING & GROUT PAD										
	**********										
310081.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310081.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310081.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310081.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	105 EA	630	23644	3990	15750	0	0	0	43384
310081.0701104	2 LABORERS	460	105 EA	630	19832	0	0	0	0	0	19832
310081.0701106	1 TEAMSTER	460	105 EA	315	11860	0	0	0	0	0	11860
310081.0701108	3 LABORERS-LOCATE WELLS CUTOFF BELOW GRADE AND EXCAVATE	460	1 EA	12	378	0	0	0	0	0	378
310081.0701110	2 OPERATORS- CUTOFF CAP ON WELLS BELOW GRADE FOR EXTENSION	460	1 EA	1	38	0	0	0	0	0	38
SUBTOTAL	SITE IMPROVEMENTS			1,628		4,090		0		0	
					57,157		15,750		0		76,997
	CONSUMABLES 3.50 %						2000				2000
	GENERAL FOREMAN 3.00 %			49	1714						1714
	GENERAL REQUIREMENTS 20.00 %			335	11774						11774
	SALES TAX 8.00 %						1420		0		1420
TOTAL	COST CODE 46007			2,012		4,090		0		0	
	WBS 310081 FDNW				70,646		19,170		0		93,906
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081 SX-FARM EXTEND CASING AND GROUT PAD				2,012		4,090		0		0	
					70,646		19,170		0		93,906

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310091	T-FARM EXTEND CASING AND GROUT PAD										
310091.07	SITE IMPROVEMENTS										
310091.0701002	********** 241-T FARM- EXTEND CASING & GROUT PAD **********	460	95 EA	0	0	0	0	0	0	0	0
310091.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310091.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310091.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310091.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	95 EA	570	21392	3610	14250	0	0	0	39252
310091.0701104	2 LABORERS	460	95 EA	570	17944	0	0	0	0	0	17944
310091.0701106	1 TEAMSTER	460	95 EA	285	10730	0	0	0	0	0	10730
SUBTOTAL	SITE IMPROVEMENTS			1,465		3,710		0		0	
					51,471		14,250		0		69,431
	CONSUMABLES 3.50 %						1801				1801
	GENERAL FOREMAN 3.00 %			44	1544						1544
	GENERAL REQUIREMENTS 20.00 %			302	10603						10603
	SALES TAX 8.00 %						1284		0		1284
TOTAL	COST CODE 46007			1,810		3,710		0		0	
	WBS 310091 FDNW				63,618		17,335		0		84,663
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091 T-FARM EXTEND CASING AND GROUT PAD				1,810		3,710		0		0	
					63,618		17,335		0		84,663

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310101	TX-FARM EXTEND CASING AND GROUT PAD										
310101.07	SITE IMPROVEMENTS										
310101.0701002	**********	460	102 EA	0	0	0	0	0	0	0	0
	241-TX FARM- EXTEND CASING & GROUT PAD										
	**********										
310101.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310101.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310101.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
	**********										
310101.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	102 EA	612	22968	3876	15300	0	0	0	42144
310101.0701104	2 LABORERS	460	102 EA	612	19266	0	0	0	0	0	19266
310101.0701106	1 TEAMSTER	460	102 EA	306	11521	0	0	0	0	0	11521
SUBTOTAL	SITE IMPROVEMENTS			1,570		3,976		0		0	
					55,160		15,300		0		74,436
	CONSUMABLES 3.50 %						1930				1930
	GENERAL FOREMAN 3.00 %			47	1654						1654
	GENERAL REQUIREMENTS 20.00 %			323	11362						11362
	SALES TAX 8.00 %						1378		0		1378
TOTAL	COST CODE 46007			1,940		3,976		0		0	
	WBS 310101 FDNW				68,177		18,609		0		90,762
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310101 TX-FARM EXTEND CASING AND GROUT PAD				1,940		3,976		0		0	
					68,177		18,609		0		90,762

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310111	TY-FARM EXTEND CASING AND GROUT PAD										
310111.07	SITE IMPROVEMENTS										
310111.0701002	********** 241-TY FARM- EXTEND CASING & GROUT PAD **********	460	31 EA	0	0	0	0	0	0	0	0
310111.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310111.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310111.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
310111.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	31 EA	186	6981	1178	4650	0	0	0	12809
310111.0701104	2 LABORERS	460	31 EA	186	5855	0	0	0	0	0	5855
310111.0701106	1 TEAMSTER	460	31 EA	93	3501	0	0	0	0	0	3501
SUBTOTAL	SITE IMPROVEMENTS			505		1,278		0		0	
					17,742		4,650		0		23,670
	CONSUMABLES 3.50 %						620				620
	GENERAL FOREMAN 3.00 %			15	532						532
	GENERAL REQUIREMENTS 20.00 %			104	3654						3654
	SALES TAX 8.00 %						421		0		421
TOTAL	COST CODE 46007			624		1,278		0		0	
	WBS 310111 FDNW				21,929		5,692		0		28,899
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310111 TY-FARM EXTEND CASING AND GROUT PAD				624		1,278		0		0	
					21,929		5,692		0		28,899

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM EXTEND CASING AND GROUT PAD										
310121.07	SITE IMPROVEMENTS										
310121.0701002	********** 241-U FARM- EXTEND CASING & GROUT PAD **********	460	60 EA	0	0	0	0	0	0	0	0
310121.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	0	0	700
310121.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310121.0701008	1 TEAMSTER **********	460	1 LS	8	301	0	0	0	0	0	301
310121.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	60 EA	360	13511	2280	9000	0	0	0	24791
310121.0701104	2 LABORERS	460	60 EA	360	11333	0	0	0	0	0	11333
310121.0701106	1 TEAMSTER	460	60 EA	180	6777	0	0	0	0	0	6777
SUBTOTAL	SITE IMPROVEMENTS			940		2,380		0		0	
					33,026		9,000		0		44,406
	CONSUMABLES 3.50 %						1155				1155
	GENERAL FOREMAN 3.00 %			28	990						990
	GENERAL REQUIREMENTS 20.00 %			194	6803						6803
	SALES TAX 8.00 %						812		0		812
TOTAL	COST CODE 46007			1,161		2,380		0		0	
	WBS 310121 FDNW				40,820		10,968		0		54,168
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121 U-FARM EXTEND CASING AND GROUT PAD				1,161		2,380		0		0	
					40,820		10,968		0		54,168

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COSTS	900	1 LS	0	0	0	0	228900	0	0	228900
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	228,900	0	0	228,900
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	228,900	0	0	228,900
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	228,900	0	0	228,900

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				33,926	2,116,372	33,196	154,009	228,900	0	0	2,532,477

APPENDIX F

INDEX

VADOSE ZONE CHARACTERIZATION REPORTS

TANK FARMS VADOSE ZONE CHARACTERIZATION REPORTS

EAST TANK FARM				WEST TANK FARM		
Report Name	Report No.	Alt. Report No.		Report Name	Report No.	Alt. Report No.
A-FARM	GJO-HAN-23	GJO-98-64-TAR		S-FARM	GJO-HAN-17	GJO-97-31-TAR
A-101	GJ-HAN-106			S-101	GJ-HAN-70	
A-102	GJ-HAN-107			S-102	GJ-HAN-71	
A-103	GJ-HAN-108			S-103	GJ-HAN-72	
A-104	GJ-HAN-109			S-104	GJ-HAN-73	
A-105	GJ-HAN-110			S-105	GJ-HAN-74	
A-106	GJ-HAN-111			S-106	GJ-HAN-75	
				S-107	GJ-HAN-76	
AX-FARM	GJO-HAN-12	GJO-97-14-TAR		S-108	GJ-HAN-77	
AX-101	GJ-HAN-49			S-109	GJ-HAN-78	
AX-102	GJ-HAN-50			S-110	GJ-HAN-79	
AX-103	GJ-HAN-51			S-111	GJ-HAN-80	
AX-104	GJ-HAN-52			S-112	GJ-HAN-81	
B-FARM	GJO-HAN-28	GJO-99-113-TAR		SX-FARM	GJPO-HAN-4	DOE/ID/12584
B-101	GJ-HAN-112			SX-101	GJ-HAN-005	
B-102	GJ-HAN-113			SX-102	GJ-HAN-006	
B-103	GJ-HAN-114			SX-103	GJ-HAN-004	
B-104	GJ-HAN-125			SX-104	GJ-HAN-003	
B-105	GJ-HAN-126			SX-105	GJ-HAN-007	
B-106	GJ-HAN-127			SX-106	GJ-HAN-008	
B-107	GJ-HAN-128			SX-107	GJ-HAN-009	
B-108	GJ-HAN-129			SX-108	GJ-HAN-010	
B-109	GJ-HAN-130			SX-109	GJ-HAN-011	
B-110	GJ-HAN-131			SX-110	GJ-HAN-012	
B-111	GJ-HAN-132			SX-111	GJ-HAN-013	
B-112	GJ-HAN-133			SX-112	GJ-HAN-014	
				SX-113	GJ-HAN-015	
BX-FARM	GJO-HAN-19	GJO-98-40-TAR		SX-114	GJ-HAN-016	
BX-101	GJ-HAN-95			SX-115	GJ-HAN-017	
BX-102	GJ-HAN-89					
BX-103	GJ-HAN-96			T-FARM	GJ-HAN-27	GJO-99-101-TAR
BX-104	GJ-HAN-97			T-101	GJ-HAN-115	
BX-105	GJ-HAN-98			T-102	GJ-HAN-116	
BX-106	GJ-HAN-99			T-103	GJ-HAN-117	
BX-107	GJ-HAN-100			T-104	GJ-HAN-118	
BX-108	GJ-HAN-101			T-105	GJ-HAN-119	
BX-109	GJ-HAN-102			T-106	GJ-HAN-120	
BX-110	GJ-HAN-103			T-107	GJ-HAN-002	
BX-111	GJ-HAN-104			T-108	GJ-HAN-121	
BX-112	GJ-HAN-105			T-109	GJ-HAN-122	
				T-110	GJ-HAN-001	
				T-111	GJ-HAN-123	
				T-112	GJ-HAN-114	

TANK FARMS VADOSE ZONE CHARACTERIZATION REPORTS						
EAST TANK FARM				WEST TANK FARM		
Report Name	Report No.	Alt. Report No.		Report Name	Report No.	Alt. Report No.
BY-FARM	GJO-HAN-6	GJO-96-2-TAR		TX-FARM	GJO-HAN-11	GJO-97-13-TAR
BY-101	GJ-HAN-101			TX-101	GJ-HAN-42	
BY-102	GJ-HAN-102			TX-102	GJ-HAN-43	
BY-103	GJ-HAN-103			TX-103	GJ-HAN-44	
BY-104	GJ-HAN-104			TX-104	GJ-HAN-45	
BY-105	GJ-HAN-105			TX-105	GJ-HAN-46	
BY-106	GJ-HAN-106			TX-106	GJ-HAN-47	
BY-107	GJ-HAN-107			TX-107	GJ-HAN-48	
BY-108	GJ-HAN-108			TX-108	GJ-HAN-53	
BY-109	GJ-HAN-109			TX-109	GJO-HAN-54	
BY-110	GJ-HAN-110			TX-110	GJO-HAN-55	
BY-111	GJ-HAN-111			TX-111	GJO-HAN-56	
BY-112	GJ-HAN-112			TX-112	GJO-HAN-57	
				TX-113	GJO-HAN-58	
C-FARM	GJO-HAN-18	GJO-98-39-TAR		TX-114	GJO-HAN-59	
C-101	GJ-HAN-85			TX-115	GJO-HAN-60	
C-102	GJ-HAN-86			TX-116	GJO-HAN-61	
C-103	GJ-HAN-82			TX-117	GJO-HAN-62	
C-104	GJ-HAN-87			TX-118	GJO-HAN-63	
C-105	GJ-HAN-83					
C-106	GJ-HAN-84			TY-FARM	GJO-HAN-16	GJO-97-30-TAR
C-107	GJ-HAN-88			TY-101	GJ-HAN-64	
C-108	GJ-HAN-90			TY-102	GJ-HAN-65	
C-109	GJ-HAN-91			TY-103	GJ-HAN-66	
C-110	GJ-HAN-92			TY-104	GJ-HAN-67	
C-111	GJ-HAN-93			TY-105	GJ-HAN-68	
C-112	GJ-HAN-94			TY-106	GJ-HAN-69	
				U-FARM	GJO-HAN-8	GJO-97-1-TAR
				U-101	GJ-HAN-030	
BASELINE	GJO-HAN-22	GJO-98-55-TAR		U-102	GJ-HAN-031	
				U-103	GJ-HAN-032	
				U-104	GJ-HAN-033	
				U-105	GJ-HAN-034	
				U-106	GJ-HAN-035	
				U-107	GJ-HAN-036	
				U-108	GJ-HAN-037	
				U-109	GJ-HAN-038	
				U-110	GJ-HAN-039	
				U-111	GJ-HAN-040	
				U-112	GJ-HAN-041	

APPENDIX G

GROUNDWATER WELLS AND VADOSE ZONE WELLS LISTING

241 - A - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS #	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)				m	DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled						HW-44355,0	HW-44355,4	HW-44255,2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
10-00-01	299-E25-057	241-A-4	A6046	41397	47565	136101.6	575394.8	8		8	8	8	8	150	151	150.3	150	45.7	6/8/55	D		E-Taped	X	X	X	X	XX	XX	XX	XX	XX	XX	XX
10-00-02	NA		NA	41357	47505	136089.5	575413.1						NA				NA		NA	NA														
10-00-04	299-E25-058	241-A-5	A6047	41160	47540	136029.4	575402.6	8	8	8	8	8	8	151	151	151	151	46.0	6/30/55	D	299-E25-16	(G) Depth = 146.7	X	X	XX	XX	XX	XX	XX	XX	XX	XX	XX
10-00-06	299-E25-015	299-E25-16 EMA-2522	A4763	41125	47650	136018.6	575369.2	4		4	6	4	4*6	340	343	296	343	104.5	8/14/69	B1	Perforated 270'-338',4" 0-265',Perf 0 - 20',Grouted 0 - 260',Perforated 90-260 ft (JAJ-908-1976)	4&6" Casing/Water Level = 284'					XX	XXC	XXCC	XXCC	XXCC	XXCC	XXCC
10-00-07	299-E25-016	299-E24-13 EMA-2364 299-E24-014	A6030, A4750	41125	47800	136018.5	575323.4	6			6	6	4*6	340	343	338	343	104.5	6/30/69	B1	Perforated 270' - 338',4" 0 - 265', Perf 0 - 209',Grouted 0 - 260', Backfilled 240-312 ft + 5 ft grout plug,90-200	4&6" Casing						XXC	XXCC	XXCC	XXCC	XXCC	XXCC
10-00-08	299-E24-013	EMA-2383	A4749	41187	47875	136037.3	575300.5	6	4	4	6	4	4*6	340	343	308	343	104.5	9/11/69	B1	Perforated 270' - 338' (JAJ-908,1976) Perforated 0-20' & 260-90', Grouted 0-260', Concrete Plug 308-313', Backfilled 313-340 ft.(JAJ-638-1),6/19/75	(G) Depth Recorded/ 4&6" Casing 4" 0-265					XXC	XXC	XXCC	XXCC	XXCC	XXCC	XXCC
10-01-01	299-E25-097		A6532	41247	47781	136055.7	575329.1	8	6	8	6	8	6	75	75		75	22.9	2/28/62	F	Deepened and Grouted 8/78	Well Completion Report,Depth = 125', Grouted T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-01-01	299-E25-097		A6532											130	130	125	130	39.6	8/30/78			E-Taped =124.3'											
10-01-03	299-E25-091		A6530	41213	47757	136045.4	575336.5	8		8	6	8	6	75	75		75	22.9	4/1/62	F					XX	XX	XX	XX	XX	XX	XX	XX	XX
10-01-04	299-E25-092		A6531	41172	47770	136032.9	575332.5	8	6	8	6	6	6	75	75		75	22.9	4/9/62	F	Deepened and Grouted 8/78	Grouted T&B, Well Completion Report,			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-01-04	299-E25-092		A6531						6					130	130		130	39.6	9/20/78			6" for 130', 8" for 18'											
10-01-05	299-E25-001	IBM-2330 241-A-1	A4759	41166	47759	136031.0	575335.9	8	4/8	8		8	4/8	322	322		322	98.1	2/25/55	B1	Perforated 280' - 310' 4" 0 - 275', Perf 0 - 209', Grouted	4&8" Casing,Grouted T&B, Well Completion Report,Well Constr. Details	XX	XX	XX	XX	XXC	XXC	XXCC	XXCC	XXCC	XXCC	XXCC
10-01-06	299-E24-070	299-E25-93	A5925	41157	47809	136028.3	575320.7	6	6	6		6	6	75			75		4/1/62	F	Deepened 9/78, Grouted	Grouted T&B, Well Completion Report						XX	XX	XXC	XXC	XXC	XXC
10-01-06	299-E24-070	299-E25-93	A5925											130	130		130	39.6	9/18/78														
10-01-08	299-E24-071	299-E25-94	A5926	41178	47845	136034.6	575309.7	8		6	6	6	6	75	75		75	22.9	2/13/62	F	Deepened 9/78, Grouted	Grouted T&B/ Well Completion						XX	XX	XXC	XXC	XXC	XXC
10-01-08	299-E24-071	299-E25-94	A5926					6						130	130		130	39.6	9/12/78														
10-01-09	NA		B8052								6	6	6			73.3	73.3	22.3	NA	F		E-Taped											
10-01-10	299-E24-072	299-E25-95	A5927	41224	47850	136048.6	575308.1	8	6	6	8	6	6	75	75		75	22.9	5/3/62	F	Deepened 9/78, Grouted							XX	XX	XXC	XXC	XXC	XXC
10-01-10	299-E24-072	299-E25-95	A5927					6						130	130	124.3	130	39.6	9/5/78			Well Completion Log/ 6" Casing/ E-Taped											
10-01-11	299-E24-073	299-E25-96	A5928	41250	47822	136056.6	575316.6	8	6	6	6	6	6	75				0.0	5/2/62	F	Deepened 9/78, Grouted	Well Completion Report						XX	XX	XXC	XXC	XXC	XXC
10-01-11	299-E24-073	299-E25-96	A5928					6						130	130	124.1	130	39.6	9/1/78			E-Taped											
10-01-16	299-E25-170	299-E25-14 & 299-E25-6A	A6585	41176.7	47774	136034.3	575331.3	6			4*6	6 welded	4*6	204	50	52.4	50	15.2	1/1/66	G	4" Liner Grouted	E-Taped, Well Completion Report, 4&6" Casing									XXC	XXC	XXC
10-01-28	299-E25-204		A6608	41187	47768	136037.4	575333.1	6	6	6	6	6	6	45	45	44	44	13.4	1/13/84	F	Grouted	E-Taped/Hole Grouted, Well Completion Report									XXC	XXC	XXC
10-01-39	299-E25-192		A6598	41179	47772	136035.0	575331.9	6	6		6	6 welded	6	46	46	45	45	13.7	3/1/82	F		E-Taped, Well Completion Report									XX	XX	XX
	299-E24-65	299-E25-52 & 216-A-216		41170	47819	136032.2	575317.6	8					8	40/80				50.0	12/1/52	F1	Deepened							XX	XX	XX	XX	XXC	XXC
	299-E25-148			41185	47769	136036.8	575332.8	?					?	42				42.0	2/1/81	H1	Backfilled and Sealed										XXC	XXC	XXC
	299-E25-149			41177	47776	136034.4	575330.7	?					?	43				43.0	2/1/81	H1	Backfilled and Sealed										XXC	XXC	XXC
	299-E25-152			41195	47765	136039.9	575334.0	?					?	42				42.0	2/1/81	H1	Backfilled and Sealed										XXC	XXC	XXC
	299-E25-171			41178	47777	136034.7	575330.4	?					?	15				15.0	12/1/80	H1	Backfilled and Sealed										XXC	XXC	XXC
	299-E25-172			41183	47777	136036.2	575330.4	?					?	15				15.0	12/1/80	H1	Backfilled and Sealed										XXC	XXC	XXC
10-02-01	299-E25-090		A6529	41240	47670	136053.7	575363.0	6	6	6	6	6	6	75	75		75	22.9	4/21/62	F	Deepened and Grouted 8/78	Grouted T&B/ 6&8" Casing(Pulled 8")			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-01	299-E25-090		A6529											130	130	124.5	130	39.6	7/11/78			E-Taped/ Well Completion Log(125')											
10-02-03	299-E25-083		A6522	41201	47652	136041.8	575368.5	6	6	6	6	6	6	75	75		75	22.9	4/20/62	F	Deepened and Grouted 8/78				XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-03	299-E25-083		A6522											130	130	123.9	130	39.6	5/30/78			E-Taped/ Well Completion Report/Grouted T&B											
10-02-05	299-E25-085		A6524	41166	47675	136031.1	575361.5	6	6	6	6	6	6	75	75		75	22.9	4/18/62	F	Deepened and Grouted 8/78	Grouted T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-05	299-E25-085		A6524											130	130	124.1	130	39.6	6/5/78			E-Taped/ Well Completion Report Depth =125'											
10-02-06	299-E25-086		A6525	41158	47714	136028.6	575349.6	8	6	8	6	6	6	75	75		75	22.9	4/17/62	F	Deepened and Grouted 8/78	Well Completion Report			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-06	299-E25-086		A6525											90	90	87.2	90	27.4	6/1/78			E-Taped											
10-02-08	299-E25-087		A6526	41184	47746	136036.5	575339.8	6	6	6	6	6	6	75	75		75	22.9	4/30/62	F	Deepened and Grouted 8/78	Well Completion Report			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-08	299-E25-087		A6526						6					130	130	127.1	130	39.6	6/15/78			E-Taped, 8" for 18', 6" for 130'											
10-02-10	299-E25-088		A6527	41226	47746	136049.3	575339.8	8	6	6	6	6	6	75	75		75	22.9	2/9/62	F	Deepened and Grouted 8/78	Grouted T&B/ 6&8" Casing			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-10	299-E25-088		A6527					6						130	130	124.5	130	39.6	6/20/78			E-Taped											
10-02-11	299-E25-089		A6528	41250	47720	136056.7	575347.7	6		6	6	6	6	75	75		75	22.9	4/1/62	F	Deepened and Grouted 8/78	Well Completion Report/ 6&8" Casing			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-02-11	299-E25-089		A6528											130	130	126.2	130	39.6	6/29/78			E-Taped											
																		0.0															
10-03-01	299-E25-078		A6517	41250	47583	136056.8	575389.5	8	6	8	6	6	6	75	75		75	22.9	5/1/62	F	Deepened and Grouted 8/78				XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-03-01	299-E25-078		A6517											130	130	125	130	39.6	9/22/78			Well Completion Report											
10-03-02	299-E25-079		A6518	41234	47553	136051.9	575398.6	6	6	6	6	6	6	75	75		75	22.9	4/30/62	F	Deepened and Grouted 8/78	6&8" Casing (Pulled 8")			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-03-02	299-E25-079		A6518											130	130	125	130	39.6	4/30/78			Well Completion Report											
10-03-04	299-E25-080		A6519	41180	47558	136035.5	575397.1	6	6	6	6	6	6	75	75		75	22.9	4/27/62	F	Deepened and Grouted 8/78	Well Completion Report/ Grouted T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-03-04	299-E25-080		A6519											130	130	125	130	39.6	5/5/78														
10-03-05	299-E25-081		A6520	41158	47591	136028.7	575387.1	6	6	6	6	6	6	75	75		75	22.9	4/26/62	F	Deepened and Grouted 8/78	Well Completion Report/ Grouted T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-03-05	299-E25-081		A6520											130	130	125	130	39.6	5/10/78														
10-03-07	299-E25-082		A6521	41168	47632	136031.8	575374.6	6		6	6	6	6	75	75		75	22.9	4/24/62	F	Deepened and Grouted 8/78	E-Taped/ Well Completion Report/ Grouted T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-03-07	299-E25-082		A6521											130	130	125	130	39.6	5/26/78														
10-03-10	299-E25-055	241-A-3	A6044	41223	47656	136048.5	575367.2	8		8	8	8	8	151	151	148.3	151	46.0	5/31/55	F1		E-Taped	X	X	X	X	X	XX	XX	XX	XX	XX	XX
10-03-11	299-E25-084		A6523	41250	47635	136056.7	575373.6	8		8	6	8	6	85	85	88	85	25.9	4/7/64	F		E-Taped			XX	XX	XX	XX	XX	XX	XX	XX	XX

241 - A - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS									
FARM #	SITE #	PREVIOUS #	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
10-04-01	299-E25-061		A6500	41345	47774	136085.6	575331.2	8		8	6	8	6	75			75	22.9	5/7/62	F	Deepened	E-Taped			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-04-01	299-E25-061		A6500											125	130	125.6	130	39.6	10/29/76															
10-04-04	299-E25-056	241-A-2	A6045	41283	47753	136066.7	575337.6	8		8	8	8	8	151	151	148.2	151	46.0	6/2/55	F1		E-Taped	X	X	XX	XX	XX	XX	XX	XX	XX	XX	XX
10-04-05	299-E25-063		A6502	41275	47768	136064.3	575333.1	8		8	6	8	6	75	75		75	22.9	4/16/62	F	Deepened 11/76 to 130 ft.	E-Taped			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-04-05	299-E25-063		A6502											130	130	123.1	130	39.6	11/2/76															
10-04-07	299-E24-066	299-E25-64	A5921	41262	47819	136060.2	575317.5	8		6	6	6	6	75	75		75	22.9	5/3/62	F	Deepened per Project #241-A,200E,CAC-928	E-Taped						XX	XXC	XXC	XXC	XXC	XXC
10-04-07	299-E24-066	299-E25-64	A5921					6						125	125	125	125	38.1	10/28/76		JAJ-989													
10-04-08	299-E24-067	299-E25-66 & 299-E24-63	A5922	41287	47849	136067.8	575308.4	8	8	6	6	6	8	75	75		75	22.9	6/28/56	F1	Deepened, PUREX TH-3	E-Taped						XX	XXC	XXC	XXC	XXC	XXC
10-04-08	299-E24-067	299-E25-66 & 299-E24-63	A5922					6						125	130	124.6	130	39.6	10/28/76		JAJ-989													
10-04-10	299-E24-068	299-E25-59	A5923	41328	47848	136080.3	575308.6	8		6	6	6	4*6	75	75		75	22.9	5/4/62	G	Deepened 11/72	Well Completion Report(122') / 4&6" Casing - Grouted Between Casings						XX	XXC	XXC	XXC	XXC	XXC
10-04-10	299-E24-068	299-E25-59	A5923					6						130	122	130	122	37.2	11/3/76															
10-04-12	299-E24-069	299-E25-60	A5924	41355	47815	136088.6	575318.7	8		6	6	6	6	75			75	22.9	5/31/62	F	Deepened	E-Taped/ 73.1' / Well Completion Report						XX	XXC	XXC	XXC	XXC	XXC
10-04-12	299-E24-069	299-E25-60	A5924					6						130	123	72.5	123	37.5	7/25/78															
10-05-02	299-E25-068	299-E25-59	A6507	41335	47663	136082.6	575365.0	4		4	4	4	4*6	75	75		75	22.9	5/8/62	G	Deepened and Grouted 8/78	E-Taped / 4&6" Casing			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-05-02	299-E25-068		A6507											130	122	119.8	122	37.2	7/25/78															
10-05-05	299-E25-070		A6509	41264	47679	136061.0	575360.2	8		8	6	8	6	75	75	74.7	75	22.9	4/5/62	F		E-Taped			XX	XX	XX	XX	XX	XX	XX	XX	XX
10-05-07	299-E25-071		A6510	41285	47721	136060.6	575347.4	8		8	6	8	6	75	75	75.7	75	22.9	4/12/62	F		E-Taped			XX	XX	XX	XX	XX	XX	XX	XX	XX
10-05-08	299-E25-098		A6533	41274	47739	136064.0	575341.9	6		6	6	6	6	56	30	55.3	30	9.1	1/26/66	F		E-Taped				X	X	XX	XX	XX	XX	XX	XX
10-05-09	299-E25-062		A6501	41304	47753	136073.1	575337.6	8		8	6	8	6	75	75	76.8	75	22.9	4/24/62	F	Deepened, May have hit water in 1962, Anal. Results. Deepened Later	E-Taped			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-05-09	299-E25-062		A6501											125	75	125	125	38.1	4/24/62															
10-05-10	299-E25-066		A6505	41339	47738	136083.8	575342.1	6	6	6		6	6	75	75		75	22.9	4/26/62	F	Deepened and Grouted 8/78	Grouted T&B, Well Completion Report/ 6&8" Casing,8" Pulled			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-05-10	299-E25-066		A6505											130	130		130	39.6	5/22/78															
10-05-12	299-E25-067		A6506	41335	47697	136082.6	575354.6	8		8	6	8	6	75	75	75.9	75	22.9	4/12/62	F	Deepened	E-Taped			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-05-12	299-E25-067		A6506											125		125	125	38.1																
10-06-02	299-E25-074		A6513	41337	47562	136083.3	575395.8	8	6	8	6	6	6	75	75		75	22.9	5/2/62	F	Deepened and Grouted 8/78	E-Taped/ Well Completion Log/ Drilled 8" Hole Around 6"			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-06-02	299-E25-074		A6513											130	130	123.3	130	39.6	8/2/78															
10-06-04	299-E25-075		A6514	41296	47552	136070.8	575398.9	8		8	6	6	6	75			75	22.9	5/1/62	F	Deepened and Grouted 8/78	E-Taped, GROUTED T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-06-04	299-E25-075		A6514											130	130	123.7	130	39.6	8/8/78															
10-06-05	299-E25-076		A6515	41264	47576	136061.1	575391.6	8		8	6	6	6	75	75	74.9	75	22.9	4/30/62	F		E-Taped			XX	XX	XX	XX	XX	XX	XX	XX	XX
10-06-07	299-E25-077		A6516	41264	47622	136061.0	575377.6	6	6	6	6	6	6	75	70		75	22.9	2/1/62	F	Deepened and Grouted 8/78	E-Taped, Well Completion Report			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-06-07	299-E25-077		A6516						6					130	130	124.0	130	39.6	7/18/78			8" for 18', 6" for 130'												
10-06-09	299-E25-069		A6508	41304	47651	136073.2	575368.7	6	6	6	6	6	6	75	75		75	22.9	4/8/64	F	Deepened and Grouted 8/78	E-Taped/ Well Completion Report(6" Bore)/ Grouted T&B,Pulled 8" After Grouting			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-06-09	299-E25-069		A6508											130	130	123.2	130	39.6	7/12/78															
10-06-10	299-E25-072		A6511	41338	47637	136083.6	575372.9	6	6	6	6	6	6	75	75		75	22.9	4/10/62	F	Deepened and Grouted 8/78	E-Taped/ Well Completion Report/ Grouted T&B			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-06-10	299-E25-072		A6511											130	130	124.7	130	39.6	7/17/78															
10-06-12	299-E25-073		A6512	41356	47598	136089.1	575384.8	6	6	6	4	4	4*6	75	75		75	22.9	5/8/62	G	Deepened and Grouted 8/78	E-Taped/ Well Completion Report/ 4&6' Casing			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC
10-06-12	299-E25-073		A6512											110	110	104.3	110	33.5	7/25/78															
NA	299-E25-051	216-A-1	A6040	41357	47505	136089.5	575413.1	8	8				8	80	80		80	24.4	12/8/52	F1	Log on File, Casing Removed		XXC	XXC	XX	XX	XXC	****	****	****	XXC	XXC	XXC

241 - AX - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355.0	HW-44353.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
11-01-01	299-E25-099		A6534	41776	47453	136217.2	575428.6	6	6	6	6	6	6	100	100	100	100	30.5	11/26/74	F				O	O	O	O	X	XX	XX	XX	XX	XX
11-01-02	299-E25-100		A6535	41753	47429	136210.2	575436.0	6		6	6	6	6	100	100	100	100	30.5	12/2/74	F								X	XX	XX	XX	XX	XX
11-01-04	299-E25-101		A6537	41710	47429	136197.1	575436.0	6		6	6	6	6	100	100	100	100	30.5	1/15/75	F								X	XX	XX	XX	XX	XX
11-01-05	299-E25-102		A6538	41682	47458	136188.6	575427.2	6		6	6	6	6	100	100	100	100	30.5	1/17/75	F								X	XX	XX	XX	XX	XX
11-01-07	299-E25-103		A6539	41692	47500	136191.6	575414.4	6		6	6	6	6	100	100	100	100	30.5	1/23/75	F								X	XX	XX	XX	XX	XX
11-01-09	299-E25-104		A6540	41726	47520	136201.9	575408.2	6		6	6	6	6	100	100	100	100	30.5	12/23/74	F								X	XX	XX	XX	XX	XX
11-01-11	299-E25-105		A6541	41773	47495	136216.3	575415.8	6		6	6	6	6	100	100	100	100	30.5	12/19/74	F								X	XX	XX	XX	XX	XX
11-02-02	299-E25-106		A6542	41648	47429	136178.2	575436.0	6		6	6	6	6	100	100	100	100	30.5	1/4/75	F								X	XX	XX	XX	XX	XX
11-02-04	299-E25-107		A6543	41600	47428	136163.6	575436.4	6		6	6	6	6	100	100	100	100	30.5	2/21/75	F								X	XX	XX	XX	XX	XX
11-02-05	299-E25-108		A6544	41585	47455	136159.0	575428.2	6		6	6	6	6	100	100	100	100	30.5	2/3/75	F								X	XX	XX	XX	XX	XX
11-02-07	299-E25-109		A6545	41585	47495	136159.0	575416.0	6		6	6	6	6	100	100	100	100	30.5	2/12/75	F								X	XX	XX	XX	XX	XX
11-02-08	299-E25-110		A6546	41595	47520	136162.0	575408.4	6		6		6	6	100	100	100	100	30.5	2/14/75	H	Capped Below Grade and Encasement, Ref. Drw H-2-36935, rev. 4	Drill Log (Bore Size Unknown),WELL ABANDONED per Gamma Log Data							X	XXC	XXC	XXC	XXC	XXC
11-02-10	299-E25-111		A6547	41644	47519	136176.9	575408.6	6		6	6	6	6	100	100	100	100	30.5	2/18/75	F								X	XX	XX	XX	XX	XX
11-02-11	299-E25-112		A6548	41669	47499	136184.6	575414.7	6		6	6	6	6	100	100	100	100	30.5	1/21/75	F								X	XX	XX	XX	XX	XX
11-03-02	299-E25-113		A6549	41764	47532	136213.5	575404.6	6		6	6	6	6	100	100	100	100	30.5	1/30/75	F								X	XX	XX	XX	XX	XX
11-03-05	299-E25-114		A6550	41691	47540	136191.2	575402.2	6		6	6	6	6	100	100	100	100	30.5	12/24/74	F								X	XX	XX	XX	XX	XX
11-03-07	299-E25-115		A6551	41691	47589	136191.2	575387.2	6		6		6	6	100	100		100	30.5	2/25/75	F								X	XX	XX	XX	XX	XX
11-03-09	299-E25-116		A6552	41720	47610	136200.0	575380.8	6		6	6	6	6	120	120	120	120	36.6	1/27/75	F								X	XX	XX	XX	XX	XX
11-03-10	299-E25-117		A6553	41761	47602	136212.5	575383.2	6		6	6	6	6	100	100	100	100	30.5	1/3/75	F								X	XX	XX	XX	XX	XX
11-03-12	299-E25-118		A6554	41776	47569	136217.1	575393.3	6		6	6	6	6	100	100	100	100	30.5	12/13/74	F								X	XX	XX	XX	XX	XX
11-04-01	299-E25-119		A6555	41672	47547	136185.4	575400.1	6		6	6	6	6	100	100	100	100	30.5	12/30/74	F								X	XX	XX	XX	XX	XX
11-04-05	299-E25-120		A6556	41583	47544	136158.3	575401.1	6		6	6	6	6	100	100	100	100	30.5	2/20/75	F								X	XX	XX	XX	XX	XX
11-04-07	299-E25-121		A6557	41588	47586	136159.8	575388.3	6		6	6	6	6	95.8	95.8	96	95.8	29.2	3/5/75	F								X	XX	XX	XX	XX	XX
11-04-08	299-E25-122		A6558	41605	47604	136165.0	575382.8	6		6	6	6	6	100	100	100	100	30.5	2/28/75	F								X	XX	XX	XX	XX	XX
11-04-10	299-E25-123		A6559	41650	47612	136178.7	575380.3	6		6	6	6	6	100	100	100	100	30.5	3/4/75	F								X	XX	XX	XX	XX	XX
11-04-11	299-E25-124		A6560	41672	47581	136185.4	575389.7	6	6	6	6	6	6	100	100	125	100	30.5	1/24/75	F	Deepened and Grouted 4/78	Well Completion Report, Grouted T&B							X	XX	XXC	XXC	XXC	XXC
11-04-11	299-E25-124		A6560	41672	47581	136185.4	575389.7							130	130	125	130	39.6	4/1/78														
11-02-22	299-E25-127		A6561	41670	47508	136184.9	575412.0	6	6	6	6	N/F	6	71	71	NA	71	21.6	5/29/75	F	Deepened and Grouted 4/22/78	Drill Log/ Well Comp Report/ Grout T&B								XX	XXC	XXC	XXC	XXC
11-02-22	299-E25-127		A6561	41670	47508	136184.9	575412.0							130	120	125	120	36.6	4/27/78														
11-02-12	299-E25-128		B2899	41675	47485	136186.4	575419.0				6	6	6		54	52	54	16.5	5/25/75	F		Hit Cement @ 54 ft(Drill Log)											
11-02-23	NA		A6562	41675	47485	136186.4	575419.0	6		6	not on list	N/F	6	54	54	54	54	16.5	5/25/75	F		Hit Cement @ 54 ft(Drill Log), DUPLICATE w/ 11-02-12								XX	XX	XX	XX	XX
11-01-10	299-E25-131		B2896	41763	47511	136213.2	575392.7				6	6	6			73	73		NA	F														
11-02-01	299-E25-132		A6563	41668	47499	136184.3	575414.7	6	6		6	6	6	130	130	125	130	39.6	4/4/78	F	Grouted (top&bot.)	8" for 16', 6" for 130', Well Completion Report									XC	XC	XC	XC
11-02-03	299-E25-133		B2898	41629	41728	136177.3	577173.5				6	6	6			75	75		1/1/78	F														
NA	299-E25-137		NA	41587.5	47522.5	136159.7	575407.6	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4	Approximate coordinates. Loactions were given based on distance from other wells.														
NA	299-E25-138		NA	41586	47701	136159.1	575353.2	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4	Approximate coordinates. Loactions were given based on distance from other wells.														
NA	299-E25-139		NA	41580	47695	136157.3	575355.0	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4	Approximate coordinates. Loactions were given based on distance from other wells.														
NA	299-E25-140		NA	41584	47699	136158.5	575353.8	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4	Approximate coordinates. Loactions were given based on distance from other wells.														
NA	299-E25-141		NA	41593	47491	136161.4	575417.2	4					4	52.5			52.5	16.0	12/31/60	H	Fill Well. Perforated Bottom 2' of casing. Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4														
NA	299-E25-142		NA	41589	47493	136160.2	575416.6	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4														
NA	299-E25-143		NA	41582	47697	136157.9	575354.4	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4														
NA	299-E25-144		NA	41580	47691	136157.3	575356.3	4					4	80			80	24.4	12/31/60	H	Cutoff well casing 1 foot below grade & weld cover on casing. Ref. Dwg H-2-36935, rev. 4	Approximate coordinates. Loactions were given based on distance from other wells.														
NA	299-E25-145		NA	6' from E25-109	NA	NA	NA	2					2	80			80	24.4	12/31/60	H	Top 60 feet is plastic pipe, lower 20 feet is steel pipe. Cement plastic cap. Cutoff well casing 1 foot below grade. Ref. Dwg H-2-36935, rev. 4														
11-04-19	299-E25-147		A6565	41591	47588	136160.716	575387.64	6		6	6	6	6	130	130	125	130	39.6	3/1/78	F	Grouted	Well Completion Report									XXC	XXC	XXC	XXC
NA	299-E25-013		A4762	41522	47670	136139.6	575362.7	8					8	317			317		10/1/63	B														
NA	299-E25-040		A4789	41760	47335	136212.4	575464.6	4					4	274			274		9/1/89	B														
NA	299-E25-041		A4790	41542	47330	136146.0	575466.3	4					4	279			279		9/1/89	B														
NA	299-E25-173		A6588	41655	47650	136180.2	575368.7	6					6	19			19		7/1/81	F														
NA	299-E25-174		A6589	41605	47650	136164.9	575368.7	6					6	18			18		7/1/81	F														
NA	299-E25-179		A6590	41480	47650	136126.8	575368.8	6					6	16			16		7/1/81	F														
NA	299-E25-182		A6592	41687	47689	136189.9	575356.8	6					6	12			12		8/1/81	F														
NA	299-E25-183		A6593	41696	47687	136192.6	575357.4	6					6	12			12		7/1/81	F														
NA	299-E25-185		A6595	41676	47650	136186.57	575368.67	6					6	15			15		8/1/81	F														

241 - B - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilled	Report	Drill	Gamma	Recon-cilled	m					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-3397	PNL-4907	PNL-8800
20-00-01	299-E33-053	241-B-132	A6861	45508	52615	137350.2	573852.2	12	12/10	12	10	10	12/10	152	151		151	46.0	12/7/44	C	Perforated 50' - 149'	1/2 sack of cement in bottom	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
20-00-02	299-E33-051	241-B-130	A6859	45375	52488	137309.7	573891.0	12	12/10	12	10	10	12/10	150	151		151	46.0	11/30/44	C	Perforated 49' - 149'	1/2 sack of cement in bottom	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
20-00-05	299-E33-052	241-B-131	A6860	45177	52552	137249.3	573871.7	12	12/10	12	10	10	12/10	153	154		154	46.9	11/28/44	C	Perforated 52' - 152'	1/2 sack of cement in bottom	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
20-00-07	299-E33-056	241-B-135	A6862	45177	52853	137249.1	573780.0	12	12/10	12	10	10	12/10	150	150	76.7	150	45.7	12/6/44	C	Perforated 48' - 148'	E-Taped/ 10&12" Casing, 1/2 sack of cement in bottom	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
20-00-09	299-E33-057	241-B-136	A6865	45300	52928	137286.5	573757.0	12	12/10	12	10	10	12/10	150	150	122.7	150	45.7	12/7/44	C	Perforated 49' - 149'	E-Taped/ 10&12" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
20-00-11	299-E33-055	241-B-134	A6863	45508	52815	137350.0	573791.2	12	12/10	12	10	10	12/10	159	159	151.9	159	48.5	12/15/44	C	Perforated 50' - 150'	E-Taped/ 10&12" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
20-00-12	NA			45550	52775	137362.8	573803.4			12			NA	100				0.0	NA	NA													
20-00-23	NA			NA	NA	NA	NA				6	6	6					0.0	NA	NA													
20-01-01	299-E33-261		A7068	45270	52520	137277.7	573881.4	6		6		6	6	100	100		100	30.5	6/7/74	F								X	XX	XX	XX	XX	XX
20-01-03	299-E33-220		A7027	45237	52502	137267.7	573886.9	6		6		6	6	135	135		135	41.1	5/16/73	F							X	XX	XX	XX	XX	XX	XX
20-01-05	299-E33-262		A7069	45195	52521	137254.8	573881.1	6		6		6	6	100	100		100	30.5	6/4/74	F								X	XX	XX	XX	XX	XX
20-01-06	299-E33-274		A7074	45197	52540	137255.4	573875.3	6	6	6		6	6	105	105		60	18.3	5/20/75	F		20' of 8", 105' of 6"							XX	XX	XX	XX	XX
20-01-07	299-E33-263		A7070	45195	52582	137254.8	573862.5	6		6		6	6	100	100		100	30.5	5/30/74	F								X	XX	XX	XX	XX	XX
20-01-11	299-E33-264		A7071	45270	52582	137277.6	573862.5	6		6		6	6	100	100		100	30.5	6/3/74	F								X	XX	XX	XX	XX	XX
20-02-03	299-E33-179		A6987	45337	52508	137298.1	573885.0	6		6		6	6	100	100			0.0	2/25/72	F							XX	XX	XX	XX	XX	XX	XX
20-02-05	299-E33-180		A6988	45296	52543	137285.6	573874.3	6		6		6	6	140	100		100	30.5	3/9/72	F							XX	XX	XX	XX	XX	XX	XXC
20-02-05	299-E33-180		A6988												140		140	42.7	5/2/73		Deepened 5/73													
20-02-07	299-E33-181		A6989	45300	52575	137286.8	573864.6	6		6		6	6	100	100		100	30.5	3/7/72	F							XX	XX	XX	XX	XX	XX	XX
20-02-09	299-E33-182		A6990	45337.5	52597	137298.2	573857.8	6		6		6	6	100	100		100	30.5	2/15/72	F							XX	XX	XX	XX	XX	XX	XX
20-02-11	299-E33-183		A6991	45378	52573	137310.6	573865.1	6		6		6	6	100	100		100	30.5	2/17/71	F							XX	XX	XX	XX	XX	XX	XX
20-03-02	299-E33-184		A6992	45469	52521	137338.3	573880.9	6		6	6	6	6	100	100		100	30.5	2/10/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XXC
20-03-02	299-E33-184		A6992											115	115	111.8	115	35.1	4/27/73		Deepened 4/73													
20-03-03	299-E33-185		A6993	45430	52507	137326.5	573885.2	6		6	6	6	6	100	100	99.3	100	30.5	2/29/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-03-06	299-E33-186		A6994	45392	52557	137315.2	573870.0	6		6	6	6	6	100	100		100	30.5	2/22/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XXC
20-03-06	299-E33-186		A6994											135	135	133.9	135	41.1	4/18/73		Deepened 4/73	E-Taped												
20-03-09	299-E33-187		A6995	45430	52596	137326.4	573858.1	6		6	6	6	6	100	100	100.0	100	30.5	1/18/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-03-11	299-E33-188		A6996	45478	52571	137341.0	573865.6	6		6	6	6	6	100	100	101.0	100	30.5	2/8/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-04-03	299-E33-219		A7026	45237	52608	137267.6	573854.6	6		6	6	6	6	100	100	99.1	100	30.5	5/7/73	F		E-Taped					X	XX	XX	XX	XX	XX	XX
20-04-06	299-E33-221		A7028	45187	52652	137252.3	573841.2	6		6	6	6	6	135	135	133.7	135	41.1	6/5/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-05-06	299-E33-218		A7025	45290	52655	137283.7	573840.2	6		6	6	6	6	120	120	120.1	120	36.6	5/22/73	F		E-Taped					X	XX	XX	XX	XX	XX	XX
20-06-02	299-E33-189		A6997	45469	52621	137338.3	573850.4	6		6	6	6	6	100	100	99.7	100	30.5	2/1/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-06-03	299-E33-190		A6998	45429	52609		573854.1	6		6	6	6	6	140	140	139.6	140	42.7	3/3/72	F	Deepened 4/25/73	E-Taped					XX	XX	XX	XX	XX	XX	XXC
20-06-06	299-E33-191		A6999	45393	52648	137315.1	573842.2	6		6	6	6	6	100	100	99.4	100	30.5	3/1/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-06-11	299-E33-192		A7000	45491	52663			6		6	6	6	6	125	125	125.4	125	38.1	1/13/72	F	Deepened 4/19/73	E-Taped					XX	XX	XX	XX	XX	XX	XXC
20-07-02	299-E33-212		A7019	45257	52715	137273.6	573821.9	6		6	6	6	6	100	100	100.6	100	30.5	8/22/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-07-05	299-E33-149	B-3	A6957	45195	52734	137254.7		6		6	6	6	6	100	100	97.4	100	30.5	4/14/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-07-08	299-E33-148	B-2	A6956	45220	52795	137262.2	573797.6	6		6	6	6	6	135	135	133.0	135	41.1	4/16/73	F	100' 4/16/70, Deepened in 4/13/73	E-Taped					XX	XX	XX	XX	XX	XX	XX
20-07-11	299-E33-147	B-1	A6955	45280	52770	137280.5	573805.2	6		6	6	6	6	100	100	100.0	100	30.5	4/20/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-08-02	299-E33-054	241-B-133	A6862	45375	52415	137309.8	573913.3	12	12/10		10	6	12/10	170	170	106.1	170	51.8	12/18/44	C	Perforated 50' - 150'	E-Taped, 1/2 sack of cement in bottom	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
20-08-03	299-E33-193		A7001	45330	52707	137295.8	573824.3	6		6	6	6	6	135	135	133.9	135	41.1	3/13/72	F	Deepened 4/17/73	E-Taped					XX	XX	XX	XX	XX	XX	XXC
20-08-05	299-E33-194		A7002	45296	52737	137285.4	573815.2	6		6	6	6	6	100	100	98.6	100	30.5	3/15/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-08-07	299-E33-195		A7003	45306	52784	137288.4	573800.9	6		6	6	6	6	100	100	99.8	100	30.5	3/17/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-08-09	299-E33-196		A7004	45338	52798	137298.2	573796.6	6		6	6	6	6	130	103	131.5	103	31.4	2/7/72	F	Deepened 4/13/73	E-Taped					XX	XX	XX	XX	XX	XX	XXC
20-09-02	299-E33-197		A7005	45467	52719	137337.6	573820.5	6		6	6	6	6	100	100	101.4	100	30.5	1/18/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-09-06	299-E33-198		A7006	45394	52748	137315.3	573811.8	6		6	6	6	6	100	100	101.8	100	30.5	2/8/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-09-11	299-E33-200		A7008	45472	52775	137339.0	573803.5	6		6	6	6	6	100	100	100.3	100	30.5	1/12/72	F	Deepened 4/16/73	E-Taped					XX	XX	XX	XX	XX	XX	XX
															130		130																	
20-10-02	299-E33-213		A7020	45257	52815	137273.5	573791.5	6		6	6	6	6	100	100	98.3	100	30.5	8/10/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-10-07	299-E33-216		A7023	45200	52877	137256.1	573772.6	6		6	6	6	6	100	100	98.9	100	30.5	9/17/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-10-09	299-E33-215		A7022	45238	52895	137267.6	573767.1	6		6	6	6	6	135	135	134.6	135	41.1	9/20/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-10-12	299-E33-214		A7021	45280	52855	137280.5	573779.3	6	6	6	6	6	6	120	100	120.8	120	36.6	8/3/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-10-24	299-E33-273		A7073	45277	52855	137279.5	573779.3		6				6	26	26		24	7.3	5/22/75	H	Perforated Bottom 3' of pipe	Drillers log indicates abandoned and capped (LAG)									XX	XX	XX	XX
20-11-09	299-E33-217		A7024	45337	52902	137297.8	573764.9	6	6	6	6	6	6	120	120	119.7	120	36.6	5/30/73	F		E-Taped						XX	XX	XX	XX	XX	XX
20-12-02	299-E33-201		A7009	45469	52821	137338.1	573789.5	6		6	6	6	6	100	100		100	30.5	1/7/72	F							XX	XX	XX	XX	XX	XX	XXC
20-12-02	299-E33-201		A7009											125	125	124.9	125	38.1	4/20/73		Deepened 4/73	E-Taped												
20-12-03	299-E33-199		A7007	45438	52800	137328.7	573795.9	6		6	6	6	6	100	100	99.8	100	30.5	2/3/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-12-06	299-E33-202		A7010	45398	52848	137316.4	573781.3	6		6	6	6	6	100	100	102.4	100	30.5	1/10/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-12-07	299-E33-203		A7011	45401	52884	137317.3	573770.3	6		6	6	6	6	100	100	99.8	100	30.5	1/12/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
20-12-11	299-E33-204		A7012	45469	52884	137338.0	573770.3	6		6	6	6	6	100	100	99.5	100	30.5	1/20/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX

241 - BX - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS									
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)				DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-3397	PNL-6907	PNL-8800
21-00-01	299-E33-063	241-BX-132	A6871	45670	53312	137398.9	573639.6	8		8	8	8	8	150	150	143.8	150	45.7	3/4/48	D	Perf. 40 - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XX	XXC	XXC
21-00-02	299-E33-142	BX-15	A6950	45570	53160	137368.6	573686.0	6	6	6	6	6	6	100	100	97.6	100	30.5	7/1/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-00-03	299-E33-140	BX-13	A6948	45411	53140	137320.1	573692.3		6				6	100	100		100	30.5	5/27/70	I		Well Completion Report/ Well Removed/ Grouted											
21-00-05	299-E33-062	241-BX-131	A6870	45339	53250	137298.1	573658.8	8		8	8	8	8	150	150	134.0	135	41.1	3/5/48	D	Perf. 40 - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XX	XXC	XXC
21-00-07	299-E33-077	241-BX-135	A6885	45339	53550	137297.8	573567.4	8		8	8	8	8	150		87.5	150	45.7	2/28/48	D	Perf. 40 - 100'	E-Taped (Not 150 ft)	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XX	XXC	XXC
21-00-09	299-E33-092		A6900	45462	53623	137305.3	573545.0	6		6	6	6	6	75	75	74.1	75	22.9	4/14/67	F		E-Taped					X	X	X	XX	XX	XX	XX	XX
21-00-11	299-E33-065	241-BX-134	A6873	45670	53512	137398.8	573578.7	8		8	8	8	8	150	150	132.8	150	45.7	11/21/47	D	Perf. 46 - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XX	XXC	XXC
21-00-21	299-E33-078	241-BX-136	A6886	45462	53625	137305.3	573544.4	8		8	8	8	8	150	150	144.1	150	45.7	3/1/48	D	Perf. 40 - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
21-00-22	299-E33-093		A6901	45464	53651	137305.85	573536.5	6		6	6	6	6	75	75	72.8	75	22.9	6/26/67	F		E-Taped				X	X	X	XX	XX	XX	XX	XX
21-01-01	299-E33-144	BX-17	A6952	45430	53220	137325.9	573667.9	6		6	6	6	6	100	100	99.5	100	30.5	8/4/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-01-02	299-E33-135	BX-8	A6943	45410	53185	137319.8	573678.6	6		6	6	6	6	100	100	99.5	100	30.5	5/18/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-02-01	299-E33-129	BX-1	A6937	45530	53220	137356.3	573667.8	6		6	6	6	6	100	100	101.1	100	30.5	4/27/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-02-03	299-E33-145	BX-18	A6953	45500	53208	137347.2	573671.5	6		6	6	6	6	100	100	99.5	100	30.5	8/6/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-02-04	299-E33-027		A4851	45470	53220	137338.1	573667.9	6	6	4	4	4	6	255	255/265	231.3	265	80.8	7/23/70	GI	4" 0 - 241', Perf 0 - 20' & 90 - 236', Grouted	E-Taped/ 4" -255 ft to 265 ft/ Deepened 10/6/76/ Well Completion Report w/ Well Details						x	XXC	XXC	XX	XXC	XXC
21-02-06	299-E33-143	BX-16	A6951	45450	53240	137331.9	573661.8	6		6	6	6	6	100	100	99.7	100	30.5	7/31/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-02-07	299-E33-130	BX-3	A6938	45463	53272	137335.9	573652.0	6		6	6	6	6	100	100	99.1	100	30.5	4/22/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-02-11	299-E33-131	BX-4	A6939	45537	53271	137358.4	573652.2	6		6	6	6	6	100	100	97.6	100	30.5	4/23/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-03-03	299-E33-239		A7046	45600	53204	137377.7	573672.6	6		6	6	6	6	100	100	98.9	100	30.5	10/16/73	F		E-Taped							XX	XX	XX	XX	XX
21-03-05	299-E33-229		A7036	45559	53230	137365.2	573664.7	6		6	6	6	6	100	100	99.3	100	30.5	11/2/73	F		E-Taped							XX	XX	XX	XX	XX
21-03-07	299-E33-282		A7081	45559	53276	137365.1	573650.7		6"ø		6	6	6	100	105	96.3	105	32.0	1/2/76	F	grouted.	E-Taped, 6" for 105', 8" for 20'										XX	XX
21-03-11	299-E33-275		A7075	45631	53282	137387.1	573648.8				6	6	6	100		98.7	100	30.5	1/7/76	F		E-Taped, 6" & 8" casing											
21-03-12	299-E33-238		A7045	45646	53252	137391.7	573657.9	6		6	6	6	6	100	100	99.2	100	30.5	10/25/73	F		E-Taped							XX	XX	XX	XX	XX
21-04-01	299-E33-281		A7080	45435	53320	137327.3	573637.4				6	6	6	100	25	99.4	100	30.5	4/5/77	F		E-Taped											
21-04-03	299-E33-226		A7033	45398	53304	137316.0	573642.3	6		6	6	6	6	100	100	99.6	100	30.5	10/3/73	F		E-Taped							XX	XX	XX	XX	XX
21-04-04	299-E33-277	See Note	A7076	45370	53310	137307.5	573640.5		6				6		105		105		4/12/77	F(H)	grouted.	6" for 105', 8" for 20'(removed)							XX	XX	XX	XX	XX
21-04-04	299-E33-278	See Note	A7077	45370	53320	137307.5	573637.5		6"ø		6	6	6	100	105	96.5	105	32.0	5/2/77	F	grouted.	E-Taped, 6" for 105', 8" for 20'											
21-04-06	299-E33-224		A7031	45350	53350	137301.4	573628.3	6		6	6	6	6	100	100	101.8	100	30.5	10/1/73	F		E-Taped							XX	XX	XX	XX	XX
21-04-08	299-E33-279		A7078	45370	53404	137307.4	573611.9		6"ø		6	6	6	100	105	100.4	100	30.5	4/25/77	F	grouted.	E-Taped, 6" for 105', 8" for 20'											
21-04-11	299-E33-280		A7079	45435	53380	137327.2	573619.1		6		6	6	6	100	105	97.8	100	30.5	4/14/77	F	grouted.	E-Taped, 6" for 105', 8" for 20'											
21-05-02	299-E33-158		A6966	45531	53319	137356.6	573637.6	6		6	6	6	6	100	100	100.3	100	30.5	11/30/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-05-03	299-E33-159		A6967	45500	53304	137347.1	573642.2	6		6	6	6	6	100	100	99.9	100	30.5	11/24/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-05-05	299-E33-160		A6968	45469	53319	137337.7	573637.7	6		6	6	6	6	100	100	99.3	100	30.5	11/18/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-05-06	299-E33-161		A6969	45453	53346	137332.8	573629.5	6		6	6	6	6	100	100	100.0	100	30.5	11/22/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-05-10	299-E33-162		A6970	45522	53386	137353.8	573617.2	6		6	6	6	6	100	100	97.9	100	30.5	12/15/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-05-12	299-E33-157		A6965	45547	53346	137361.4	573629.4	6		6	6	6	6	100	100	99.5	100	30.5	12/10/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-06-01	299-E33-163		A6971	45644	53346	137391.0	573629.3	6		6	6	6	6	100	100	99.3	100	30.5	12/7/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-06-02	299-E33-164		A6972	45631	53319	137387.0	573637.5	6		6	6	6	6	100	100	99.7	100	30.5	12/3/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-06-05	299-E33-165		A6973	45569	53319	137368.1	573637.6	6		6	6	6	6	100	100	99.9	100	30.5	12/1/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-06-10	299-E33-166		A6974	45622	53386	137384.2	573617.1	6		6	6	6	6	100	100	103.2	100	30.5	12/9/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-07-03	299-E33-225		A7032	45398	53404	137315.9	573611.8	6		6	6	6	6	100	100	100.3	100	30.5	9/27/73	F		E-Taped							XX	XX	XX	XX	XX
21-07-06	299-E33-222		A7029	45355	53450	137302.8	573597.9	6		6	6	6	6	100	100	101.9	100	30.5	9/27/73	F		E-Taped							XX	XX	XX	XX	XX
21-08-02	299-E33-064	241-BX-133	A6872	45537	53412	137358.3	573609.3	8		8	8	8	8	150	150	129.5	150	45.7	11/20/47	D	Perf. 40 - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XX	XXC	XXC
21-08-04	299-E33-234		A7041	45482	53406	137341.5	573611.8	6		6	6	6	6	100	100	100.3	100	30.5	9/19/73	F		E-Taped							XX	XX	XX	XX	XX
21-08-05	299-E33-235		A7042	45460	53425	137334.8	573605.4	6		6	6	6	6	100	100	100	100	30.5	9/26/73	F									XX	XX	XX	XX	XX
21-08-06	299-E33-151		A6959	45456	53454	137333.6	573596.5	6		6	6	6	6	100	100	99.7	100	30.5	1/6/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-08-07	299-E33-152		A6960	45478	53484	137340.3	573587.4	6		6	6	6	6	100	100	100.2	100	30.5	1/5/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-08-10	299-E33-236		A7043	45531	53484	137356.4	573587.3	6		6	6	6	6	100	100	100.9	100	30.5	10/5/73	F		E-Taped							XX	XX	XX	XX	XX
21-08-12	299-E33-150		A6958	45549	53454	137361.9	573596.5	6		6	6	6	6	100	100	103.5	100	30.5	1/30/72	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-09-02	299-E33-257		A7064	45603	53416	137387.6	573608.0	6		6	6	6	6	100	100	97.9	100	30.5	12/17/73	F		E-Taped							XX	XX	XX	XX	XX
21-09-04	299-E33-233		A7040	45575	53413	137369.9	573608.9	6		6	6	6	6	100	100	100.4	100	30.5	10/9/73	F		E-Taped							XX	XX	XX	XX	XX
21-09-08	299-E33-258		A7065	45572	53486	137368.9	573586.7	6		6	6	6	6	100	100	98.2	100	30.5	12/18/73	F		E-Taped							XX	XX	XX	XX	XX
21-09-12	299-E33-231		A7028	45645	53452	137391.2	573597.0	6		6	6	6	6	100	100	97.8	100	30.5	10/12/73	F		E-Taped							XX	XX	XX	XX	XX
21-10-01	299-E33-167		A6975	45432	53519	137326.2	573576.8	6		6	6	6	6	100	100	99.4	100	30.5	9/9/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-10-03	299-E33-223		A7030	45400	53505	137316.5	573581.1	6		6	6	6	6	100	80	99.6	100	30.5	9/24/73	F		E-Taped							XX	XX	XX	XX	XX
21-10-05	299-E33-168		A6976	45369	53519	137307.0	573576.8	6		6	6	6	6	100	100	98.3	100	30.5	9/13/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-10-07	299-E33-169		A6977	45369	53581	137307.0	573557.9	6		6	6	6	6	100	100	98.7	100	30.5	9/15/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-10-11	299-E33-170		A6978	45431	53581	137325.9	573557.9	6		6	6	6	6	100	100	100	100	30.5	9/17/71	F								x	XX	XX	XX	XX	XX
21-11-03	299-E33-237		A7044	45500	53502	137347.0	573581.9	6		6	6	6	6	100	100	100	100	30.5	10/2/73	F									XX	XX	XX	XX	XX
21-11-04	299-E33-173		A6981	45478	53512	137340.2	573578.9	6		6	6	6	6	100	100	97.9	100	30.5	8/31/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-11-05	299-E33-171		A6979	45469	53519	137337.5	573576.7	6		6	6	6	6	100	100	98.4	100	30.5	9/7/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-11-07	299-E33-172		A6980	45461	53572	137335.0	573560.6	6		6	6	6	6	100	100	98.7	100	30.5	8/26/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-11-10	299-E33-174		A6982	45522	53588	137353.6	573553.6	6		6	6	6	6	100	100	99.5	100	30.5	8/24/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-11-11	299-E33-175		A6983	45532	53581	137356.6	573557.8	6		6	6	6	6	100	100	101.2	100	30.5	8/20/71	F		E-Taped						x	XX	XX	XX	XX	XX
21-12-02	299-E33-153		A6961	45616	53503	137382.3	573581.5	6		6	6	6	6	100	100	99.3	100	30.5	12/21/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-12-05	299-E33-154		A6962	45562	53528	137365.8	573573.9	6		6	6	6	6	100	100	99.6	100	30.5	12/28/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-12-07	299-E33-155		A6963	45569	53581	137367.9	573557.7	6		6	6	6	6	100	100	99.6	100	30.5	1/4/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-12-10	299-E33-156		A6964	45631	53581	137386.8	573557.7	6		6	6	6	6	100	100	100.0	100	30.5	12/30/71	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
21-12-12	299-E33-232		A7039	45645	53552	137391.1	573566.5	6		6	6	6	6	100	100	99.6	100	30.5	10/31/73	F		E-Taped							XX	XX	XX	XX	XX
21-27-01	299-E33-141	BX-14	A6949	45550	53120	137362.5	573698.3	6	6	6	6	6	6	100	100	99.4	100	30.5	6/26/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-27-02	299-E33-138	BX-11	A6946	45510	53120	137350.3	573698.3	6	6	6	6	6	6	100	100	96.3	100	30.5	5/18/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-27-06	299-E33-139	BX-12	A6947	45470	53120	137338.1	573698.3	6	6	6	6	6	6	100	100	100.0	100	30.5	5/22/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-27-07	299-E33-134	BX-07	A6942	45450	53160	137332.0	573686.2	6		6	6	6	6	100	150	138.8	150	45.7	7/29/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-27-08	299-E33-146	BX-19	A6954	45470	53195	137338.1	573675.5	6		6	6	6	6	150	150	148.5	150	45.7	8/12/70	F							XX	XX	XX	XX	XX	XX	XX
21-27-09	299-E33-133	BX-06	A6941	45490	53160	137344.2	573686.1	6		6	6	6	6	100	150	149.0	150	45.7	7/26/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-27-10	299-E33-132	BX-05	A6940	45524	53183	137354.5	573679.1	6		6	6	6	6	150	150	149.0	150	45.7	7/24/70	F		E-Taped					X	X	XX	XX	XX	XX	XX
21-27-11	299-E33-061	241-BX-130	A6869	45537	53145	137358.5	573690.6	8		8	8	8	8	150	150	138.1	150	45.7	3/4/48	D	Perf. 40 - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XX	XXC	XXC
NA	299-E33-041		A4867	45573	53091	137369.55	573707.07				0	6	6		254		254		NA	B1	Well protection report												X
NA	299-E33-136	BX-09	A6944	45490	53220	137344.1	573667.8						NA	14	14		14	4.3	6/5/70	H		Hand Auger used to Drill					XX	XX	XX	XX	XX	XX	XX
NA	299-E33-137	BX-10	A6945	45470	53240	137338.0	573661.8		8				8	14	14		14	4.3	5/28/70	H		Hand Auger used to Drill					XX	XX	XX	XX	XX	XX	XX
NA	299-E33-230		A7037	NA	NA	NA	NA	6					6	30	39		30	9.1	10/18/73	I/H	Casing Pulled												
NA	299-E33-228		A7035	45605	53204	137379.2	573672.6						6		100		100		10/16/73	F													
NA	299-E33-227		A7034	46015	53203	137504.2	573672.6						6		100		100		7/27/73	F													

NOTE:- There is conflicting data in the reference documents and drawings. Both wells 299-E33-277 and 278 are referenced to 21-04-04.
A reference document FCN-25747 could not be found to clarify. According to coordinates for the well they are approximately
10 ft east/west of each other. Drawing H-2-36939, rev 4 shows E33-277 as 21-04-04, while rev. 5 shows E33-278 as 21-04-04.
Futher detailed research would be required to resolve conflict.

241 - BY - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES														COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m	Installed				HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
22-00-01	299-E33-085	241-BY-4	A6893	46141	53298	137542.5	573643.5	8		8	8	8	8	150	150	133.4	150	45.7	8/2/49	D	Perf. 40' - 100'	E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
22-00-02	299-E33-240		A7047	46072	53195	137521.5	573674.9	6		6	6.125	6	6	100	100	99.0	100	30.5	12/7/73	F								X	XX		XX	XX	XX
22-00-03	299-E33-084	241-BY-3	A6892	46058	53198	137517.3	573674.0	8		8	8	8	8	150	150	146.0	150	45.7	7/21/49	D	Perf. 40' - 100'		XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
22-00-04	299-E33-241		A7048	46038	53202	137511.2	573672.8	6		6	6	6	6	100	100	99.0	100	30.5	12/12/73	F								X	XX	XX	XX	XX	XX
22-00-05	299-E33-083	241-BY-1	A6891	45854	53298	137455.0	573643.7	8		8	8	8	8	150	150	150.0	150	45.7	7/11/49	D	Perf. 40' - 100'	Not Found, May Be Covered By Gravel Berm	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
22-00-10	299-E33-088	241-BY-7	A6896	46051	53592	137514.8	573554.0	8		8	8	8	8	150	150	98.5	150	45.7	8/17/49	D	Perf. 40' - 100'		XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
22-01-01	299-E33-176		A6984	45929	53218	137477.9	573668.1	6		6	6	6	6	100	100	98.5	100	30.5	12/22/71	F							XX	XX	XX	XX	XX	XX	XX
22-01-03	299-E33-245		A7052	45900	53202	137469.1	573673.0	6		6	6.125	6	6	100	100	97.5	100	30.5	5/16/74	F								X	XX	XX	XX	XX	XX
22-01-04	299-E33-177		A6985	45860	53225	137456.9	573666.0	6		6	6.125	6	6	100	100	97.5	100	30.5	12/26/71	F							XX	XX	XX	XX	XX	XX	XX
22-01-07	299-E33-178		A6986	45867	53278	137459.0	573649.8	6		6	6	6	6	100	100	99.5	100	30.5	12/16/71	F							XX	XX	XX	XX	XX	XX	XX
22-01-10	299-E33-246		A7053	45911	53292	137472.4	573645.5	6		6	6	6	6	100	100	99.0	100	30.5	5/7/74	F								X	XX	XX	XX	XX	XX
22-02-01	299-E33-101	Tank 102, # 1	A6909	46038	53225	137511.2	573665.8	6		6	6	6	6	100	100	98.9	100	30.5	7/10/70	F							XX	XX	XX	XX	XX	XX	XX
22-02-02	299-E33-227		A7034	46035	53203	137504.2	573672.6	6		6	6	6	6	100	100	99.0	100	30.5	7/27/73	F								X	XX	XX	XX	XX	XX
22-02-05	299-E33-228		A7035	45961	53222	137487.7	573666.8	6		6	6	6	6	100	100	99.0	100	30.5	10/16/73	F								X	XX	XX	XX	XX	XX
22-02-07	299-E33-009	241-BY-2 IBM-2299 EMA-2299	A4873	45960	53285	137487.3	573647.6	8 to 4	4*8	4	8	4	4*8	275	275	260.8	275	83.8	7/21/49	B1	Perf. 252 - 262, 4 in., liner to 234', grouted	E-Taped/ 4&8" Casing/ Grouted/ Well Completion Log(299-E33-9), Construction As-Built	XX	XX	XX	XXC	XXC	XXC	XXC	XXCC	XXCC	XXCC	XXCC
22-02-09	299-E33-102	Tank 102, # 3	A6910	46005	53291	137501.0	573645.7	6		6	6	6	6	100	100	100.2	100	30.5	9/2/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
22-03-01	299-E33-104	Tank 103, # 1	A6912	46140	53225	137542.2	573665.7	6	6		6	6	6	100	100	95.5	100	30.5	8/7/70	F							XX	XX	XX	XX	XX	XX	XX
22-03-04	299-E33-211		A7018	46081	53207	137524.3	573671.3	6	6	6	6.25	6	6	100	100	101.0	100	30.5	12/5/72	F							XX	X	XX	XX	XX	XX	XX
22-03-05	299-E33-103	Tank 103, # 2	A6911	46064	53225	137519.1	573665.8	6	6	6	6	6	6	100	100	99.8	100	30.5	8/12/70	F							XX	XX	XX	XX	XX	XX	XX
22-03-06	299-E33-210		A7017	46056	53244	137516.6	573660.0	6	6	6	6	6	6	100	100	100.6	100	30.5	12/22/72	F		E-Taped					XX	X	XX	XX	XX	XX	XX
22-03-07	299-E33-242		A7049	46055	53265	137516.3	573653.6	6		6	6	6	6	100	100	99.0	100	30.5	12/14/73	F								X	XX	XX	XX	XX	XX
22-03-08	299-E33-244		A7051	46070	53282	137520.9	573648.4	6		6	6	6	6	100	100	99.5	100	30.5	12/6/73	F		Drill Hole Log						X	XX	XX	XX	XX	XX
22-03-09	299-E33-105	Tank 103, # 3	A6913	46102	53291	137530.6	573645.7	6		6	6	6	6	100	100	98.1	100	30.5	8/6/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
22-03-10	299-E33-243		A7050	46130	53289	137539.1	573646.3	6		6	6	6	6	100	100	86.0	100	30.5	12/7/73	F								X	XX	XX	XX	XX	XX
22-04-01	299-E33-106	Tank 104, # 1	A6914	45936	53327	137480.0	573634.8	6	6	6	6	6	6	100	100	99.3	100	30.5	9/2/70	F							XX	XX	XX	XX	XX	XX	XX
22-04-05	299-E33-107	Tank 104, # 2	A6915	45859	53326	137456.5	573635.2	6		6	6	6	6	100	100	97.5	100	30.5	7/21/70	F							XX	XX	XX	XX	XX	XX	XX
22-04-07	299-E33-248		A7055	45865	53379	137458.3	573619.1	6		6	6	6	6	100	100	100.0	100	30.5	5/13/74	F								X	XX	XX	XX	XX	XX
22-04-09	299-E33-108	Tank 104, # 3	A6916	45907	53392	137471.1	573615.1	6	6	6	6	6	6	100	100		100	30.5	8/28/70	F	Deepened to 125' 7/83	Well Completion Log					XX	XX	XX	XX	XXC	XX	XXC
	299-E33-108	Tank 104, # 3	A6916											125	125	124.5	125	38.1	7/12/83	F							XX						
22-04-11	299-E33-249		A7056	45940	53365	137481.2	573623.3	6		6	6	6	6	100	100	100.0	100	30.5	5/1/74	F								X	XX	XX	XX	XX	XX
22-05-01	299-E33-109	Tank 105, # 1	A6917	46038	53327	137511.1	573634.7	6	6	6	6	6	6	100	100	98.0	100	30.5	7/9/70	F							XX	XX	XX	XX	XX	XX	XX
22-05-05	299-E33-110	Tank 105, # 2	A6918	45962	53327	137487.9	573634.8	6		6	6	6	6	100	55	97.0	100	30.5	7/14/70	F							XX	XX	XX	XX	XX	XX	XX
22-05-09	299-E33-111	Tank 105, # 3	A6919	46000	53393	137499.4	573614.7	6		6	6	6	6	100	100	98.0	100	30.5	7/27/70	F							XX	XX	XX	XX	XX	XX	XX
22-06-01	299-E33-112	Tank 106, # 1	A6920	46140	53327	137542.2	573634.7	6	6	6	6	6	6	100	100	98.5	100	30.5	8/3/70	F							XX	XX	XX	XX	XX	XX	XX
22-06-05	299-E33-113	Tank 106, # 2	A6921	46064	53327	137519.0	573634.7	6	6	6	6	6	6	100	100	98.4	100	30.5	7/14/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
22-06-07	299-E33-086	241-BY-05	A6894	46058	53390	137517.1	573615.5	8		8	7.625	8	8	150	150	131.5	150	45.7	8/4/49	D	Perf. 40' - 100'		XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
22-06-09	299-E33-114	Tank 106, # 3	A6922	46102	53392	137530.5	573614.9	6	6	6	6	6	6	100	100	97.0	100	30.5	7/30/70	F							XX	XX	XX	XX	XX	XX	XX
22-06-11	299-E33-250		A7057	46140	53375	137542.1	573620.0	6		6	6.125	6	6	100	100	98.0	100	30.5	5/3/74	F								X	XX	XX	XX	XX	XX
22-07-01	299-E33-115	Tank 107, # 1	A6923	45936	53429	137479.9	573603.8	6		6	6	6	6	100	100	98.5	100	30.5	8/25/70	F							XX	XX	XX	XX	XX	XX	XX
22-07-02	299-E33-206		A7013	45920	53412	137475.0	573608.9	6		6	6	6	6	100	100	100.5	100	30.5	1/4/73	F							XX	X	XX	XX	XX	XX	XX
22-07-05	299-E33-116	Tank 107, # 2	A6924	45860	53429	137456.7	573603.8	6		6	6	6	6	100	100	97.2	100	30.5	7/23/70	F							XX	XX	XX	XX	XX	XX	XX
22-07-07	299-E33-251		A7058	45860	53481	137456.7	573588.0	6		6	6	6	6	100	100	99.5	100	30.5	5/9/74	F								X	XX	XX	XX	XX	XX
22-07-09	299-E33-117	Tank 107, # 3	A6925	45898	53495	137468.3	573583.7	6		6	6	6	6	100	100	99.5	100	30.5	8/25/70	F							XX	XX	XX	XX	XX	XX	XX
22-07-10	299-E33-252		A7059	45932	53497	137478.6	573583.0	6		6	6	6	6	100	100	97.6	100	30.5	5/9/74	F										XX	XX	XX	XX
22-08-01	299-E33-118	Tank 108, # 2	A6926	46038	53429	137511.0	573603.7	6		6	6	6	6	100	100	99.0	100	30.5	7/22/70	F							XX	XX	XX	XX	XX	XX	XX
22-08-02	299-E33-208		A7015	46022	53411	137506.1	573609.2	6	6	6	6	6	6	100	100	103.0	100	30.5	1/19/73	F							XX	X	XX	XX	XX	XX	XX
22-08-05	299-E33-119	Tank 108, # 1	A6927	45962	53429	137487.8	573603.7	6		6	6	6	6	100	100	98.4	100	30.5	7/28/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
22-08-06	299-E33-207		A7014	45954	53449	137485.4	573597.6	6	6	6	6	6	6	100	100	99.3	100	30.5	1/2/73	F		E-Taped					XX	X	XX	XX	XX	XX	XX
22-08-07	299-E33-087	241-BY-06	A6895	45956	53492	137485.9	573584.5	8		8	8	8	8	150	150	131.5	150	45.7	8/15/49	D	Perf. 49' - 100'		XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
22-08-09	299-E33-120	Tank 108, # 3	A6928	46008	53495	137501.8	573583.6	6		6	6	6	6	100	100	99.3	100	30.5	8/4/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
22-08-12	299-E33-209		A7016	46049	53447	137514.3	573598.2	6		6	6	6	6	100	100	104.0	100	30.5	1/26/73	F							XX	X	XX	XX	XX	XX	XX
22-09-01	299-E33-123	BY # 3	A6931	46144	53446	137543.3	573598.4	6		6	6	6	6	100	100	97.0	100	30.5	2/24/70	F							X	X	XX	XX	XX	XX	XX
22-09-02	299-E33-259		A7066	46128	53412	137538.4	573608.8	6		6	6.125	6	6	100	100	99.0	100	30.5	6/10/74	F								X	XX	XX	XX	XX	XX
22-09-05	299-E33-122	BY # 2	A6930	46069	53424	137520.4	573605.2	6		6	6	6	6	100	100	97.5	100	30.5	2/20/70	F							X	X	XX	XX	XX	XX	XX
22-09-07	299-E33-260		A7067	46060	53466	137517.7	573592.4	6		6	6.125	6	6	100	100	97.0	100	30.5	6/6/74	F								X	XX	XX	XX	XX	XX
22-09-08	299-E33-121	BY # 1	A6929	46088	53491	137526.2	573584.7	6		6	6.125	6	6	100	100	98.0	100	30.5	2/17/70	F							X	X	XX	XX	XX	XX	XX
22-09-11	299-E33-253		A7060	46137	53477	137541.1	573588.9	6		6	6	6	6	100	100	99.0	100	30.5	5/2/74	F								X	XX	XX	XX	XX	XX
22-10-05	299-E33-124	Tank 110, # 2	A6932	45860	53531	137456.6	573572.7	6		6	6.125	6	6	100	100	98.8	100	30.5	8/21/70	F							XX	XX	XX	XX	XX	XX	XX
22-10-07	299-E33-254		A7061	45860	53577	137456.6	573558.7	6		6	6	6	6	100	100	97.3	100	30.5	5/7/74	F		E-Taped						X	XX	XX	XX	XX	XX
22-10-09	299-E33-255		A7062	45888	53604	137465.1	573550.5	6		6	6.125	6	6	100	100	98.9	100	30.5	5/3/74	F								X	XX	XX	XX	XX	XX
22-10-10	299-E33-125	Tank 110, # 3	A6933	45922	53590	137475.5	573554.7	6		6	6	6	6	100	100	98.5	100	30.5	8/19/70	F							XX	XX	XX	XX	XX	XX	XX
22-11-01	299-E33-126	Tank 111, # 1	A6934	46040	53531	137511.5	573572.6	6		6	6	6	6	100	100	101.4	100	30.5	8/20/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
22-11-05	299-E33-127	Tank 111, # 2	A6935	45957	53542	137486.2	573569.3	6		6	6	6	6	100	100	97.5	100	30.5	8/17/70	F							XX	XX	XX	XX	XX	XX	XX
22-11-08	299-E33-256	241-B-135	A6864	45970	53585	137490.1	573556.2	12	10	12	6.125	12	6	150	151	98.0	151	46.0	12/31/44	C	Perforated 48 to 148'	12" for 50', 10"for 150'						X	XX	XX	XX	XX	XX
22-11-09	299-E33-128	Tank 111, # 3	A6936	46013	53595	137503.2	573553.1	6		6	6.125	6	6	100	100	99.8	100	30.5	8/13/70	F							XX	XX	XX	XX	XX	XX	XX
22-12-01	299-E33-100		A6908	46138	53526	137541.4	573574.0	6		6	6	6	6	100	100	100.0	100	30.5	11/30/67	F						x	X	X	XX	XX	XX	XX	XX
22-12-03	299-E33-094		A6902	46104	53507	137531.0	573579.8	6		6	6.125	6	6	100	100	99.5	100	30.5	11/15/67	F						x	X	X	XX	XX	XX	XX	XX
22-12-05	299-E33-095		A6903	46061	53532	137517.9	573572.3	6		6	6	6	6	100	100	99.5	100	30.5	11/22/67	F						x	X	X	XX	XX	XX	XX	XX
22-12-06	299-E33-096		A6904	46058	53563	137517.0	573562.8	6		6	6	6	6	100	100	100.0	100	30.5	12/1/67	F						x	X	X	XX	XX	XX	XX	XX
22-12-07	299-E33-097		A6905	46072	53588	137521.2	573555.2	6		6	6.125	6	6	100	100	101.5	100	30.5	11/29/67	F						x	X	X	XX	XX	XX	XX	XX
22-12-09	299-E33-098		A6906	46101	53599	137530.0	573551.8	6		6	6	6	6	100	100	100.5	100	30.5	12/6/67	F						x	X	X	XX	XX	XX	XX	XX
22-12-10	299-E33-099	6-BY	A6907	46142	53591	137542.5	573554.2	6		6	6	6	6	100	100	99.5	100	30.5	12/5/67	F						x	X	X	XX	XX	XX	XX	XX

241 - C - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilled	Report	Drill	Gamma	Recon-cilled	m	Installed				HW-44353.0	HW-44353.1	HW-44353.2	HNWL-928	HNWL-1739	HNWL-1961	HNWL-2294	PNL-2894	PNL-5397	PNL-6907	PNL-8888
30-00-01	299-E27-056	241-C-132	A6681	42954	48191	136575.6	575202.7	12	12/8	12	8	10	12/8	145	146	146.0	146	44.5	12/27/44	C1	Cement on bottom, Perforated 43' - 143'	E-Taped/ 8&12" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-00-03	299-E27-054	241-C-130	A6679	42771	48149	136519.9	575215.6	12	12/8	12	12	10	12/8	155	155	118.8	155	47.2	01/04/45	C1	Cement on bottom, Perforated 54' - 154'	E-Taped/ 8&12" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-00-06	299-E27-055	241-C-131	A6680	42677	48370	136491.0	575148.4	12	12/10	12	8	10	12/10	154	154	111.2	154	46.9	12/30/44	C	Cement on bottom, Perforated 53' - 153'	10&12" Casing, E-Taped	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-00-09	299-E27-057	241-C-135	A6682	42889	48583	136555.4	575083.3	12	12/8	12	8	10	12/10	150	154	150.0	150	45.7	12/31/44	C	Cement on bottom, Perforated 51' - 151'	Gamma Log to 111.0 ft, 8"&12" casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-00-10	299-E27-053	241-C-136	A6678	43029	48549	136598.1	575093.5	12	12/8	12	6	10	12/8	150	150	150.0	150	45.7	12/14/44	C1	Perforated 48' - 148'	Gamma Log to 52.2 ft/ 8&12" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-00-11	299-E27-121		A6741	42840	48780	136540.3	575023.3	6	6"8	6	6	N/F	6	60	65	58.8	60	18.3	03/31/77	F	Grouted	E-Taped							X	XC	XC	XC	XC
30-00-12	299-E27-052	241-C-134	A6677	43096	48322	136618.8	575162.6	12	12/8	12	8	10	12/8	150	150	136.6	150	45.7	12/22/44	C1	Cement on bottom, Perforated 50' - 148'	E-Taped/12&8" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-00-13	299-E27-124		A6744	43150	48500	136635.1	575108.3	6	6"8	6	6	10	6	60	65	55.3	55	16.8	03/28/77	F	Grouted	E-Taped							X	XC	XC	XC	XC
30-00-22	299-E27-120		A6740	42770	48760	136519.0	575029.4	6		6	6	N/F	6	60	60	54.6	55	16.8	03/18/77	F	Grouted	E-Taped							X	XC	XC	XC	XC
30-00-24	299-E27-122		A6742	42840	48650	136540.5	575062.9	6		6	6	10	6	60		58.6	59	18.0	03/31/77	F	Grouted	E-Taped							X	XC	XC	XC	XC
30-01-01	299-E27-060	C-4	A6685	42747	48295	136512.4	575171.2	6		6	6	6	6	100	100	98.2	100	30.5	03/20/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
30-01-06	299-E27-059	C-1	A6684	42676	48328	136490.7	575161.2	6		6	6	6	6	100	100	98.8	100	30.5	02/02/69	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
30-01-09	299-E27-058	C-3	A6683	42719	48373	136503.8	575147.4	6		6	6	6	6	100	100	98.0	100	30.5	11/08/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
30-01-12	299-E27-061	C-3	A6686	42762	48339	136517.0	575157.8	6	6	6	6	6	6	100	100	100.0	100	30.5	03/16/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
30-02-01	NOT DRILLED																																
30-02-03	NOT DRILLED																																
30-02-05	NOT DRILLED																																
30-02-09	NOT DRILLED																																
30-03-01	299-E27-074		A6699	42901	48168	136559.5	575209.7	6	6	6	6	6	6	100	100		100	30.5	06/28/74	F	Deepened to 125' 7-83, Grouted	Well Completion Log						X	x	x	XXC	XXC	XXC
30-03-01	299-E27-074		A6699	NA	NA	NA	NA			6				125	125	124.6	125	38.1	07/06/83	F		E-Taped											
30-03-03	299-E27-075		A6700	42861	48140	136547.3	575218.3	6		6	6	6	6	100	100	98.6	100	30.5	07/02/74	F		E-Taped						X	x	x	XX	XX	XX
30-03-05	299-E27-076		A6701	42820	48165	136534.8	575210.7	6		6	6	6	6	100	100	100.2	100	30.5	07/31/74	F		E-Taped						X	x	x	XX	XX	XX
30-03-07	299-E27-077		A6702	42820	48212	136534.7	575196.4	6		6	6	6	6	100	100	96.9	100	30.5	09/19/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-03-09	299-E27-078		A6703	42861	48231	136547.2	575190.6	6		6	6	6	6	100	100	99.1	100	30.5	06/25/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-04-01	299-E27-115		A6735	42829	48378	136537.3	575145.8	6		6	6	6	6	50	50	49.8	50	15.2	07/09/74	F		E-Taped, 6&8" Casing, Pulled 8" Casing, Casing even w/Grade						X	XX	XX	XX	XX	XX
30-04-02	299-E27-067		A6692	42826	48366	136536.4	575149.5	6		6	6	6	6	130	135	134.8	135	41.1	12/04/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-04-03	299-E27-116		A6736	42817	48365	136533.7	575149.8	6		6	6	6	6	50	50	49.7	50	15.2	07/10/74	F		E-Taped, 6&8" Casing, Pulled 8" Casing, Casing even w/Grade						X	XX	XX	XX	XX	XX
30-04-04	299-E27-079		A6704	42790	48352	136525.5	575153.8	6		6	6	6	6	100	80	98.8	100	30.5	06/19/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-04-05	299-E27-080		A6705	42747	48377	136512.3	575146.2	6		6	6	6	6	100	100	99.3	100	30.5	07/22/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-04-08	299-E27-066		A6691	42759	48437	136516.0	575127.9	6		6	6	6	6	145	145	143.2	145	44.2	11/30/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-04-12	299-E27-065		A6690	42835	48405	136539.1	575137.6	6		6	6	6	6	135	135	135.5	135	41.1	12/20/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-05-02	299-E27-070		A6695	42893	48290	136556.9	575172.6	6		6	6	6	6	130	130	128.1	130	39.6	11/20/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-05-03	299-E27-081		A6706	42861	48282	136547.2	575175.0	6		6	6	6	6	100	100	98.8	100	30.5	09/18/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-05-04	299-E27-069		A6694	42825	48294	136536.2	575171.4	6		6	6	6	6	120	120	118.5	120	36.6	12/22/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-05-05	299-E27-082		A6707	42813	48327	136532.5	575161.4	6		6	6	6	6	100	100	98.9	100	30.5	06/21/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-05-06	299-E27-119		A6739	42814	48353	136532.8	575153.4	6		6	6	6	6	60	60	58.1	60	18.3	07/30/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-05-07	299-E27-118		A6738	42826	48353	136536.4	575153.4	6		6	6	6	6	70	70	67.3	70	21.3	07/12/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-05-08	299-E27-117		A6737	42838	48367	136540.1	575149.2	6		6	6	6	6	50	50	49.3	50	15.2	07/15/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-05-09	299-E27-083		A6708	42861	48375	136547.1	575146.7	6		6	6	6	6	100	100	101.2	100	30.5	06/18/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-05-10	299-E27-068		A6693	42893	48366	136556.9	575149.4	6		6	6	6	6	135	135	135.8	135	41.1	11/27/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-06-02	299-E27-072		A6697	42967	48224	136579.5	575192.6	6		6	6	6	6	125	125	122.8	125	38.1	11/10/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-06-03	299-E27-084		A6709	42932	48209	136568.9	575197.2	6		6	6	6	6	100	100	98.9	100	30.5	06/27/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-06-04	299-E27-073		A6698	42897	48228	136558.2	575191.5	6		6	6	6	6	130	130	129.8	130	39.6	11/08/72	F		E-Taped					X	X	XX	x	XX	XX	XX
30-06-09	299-E27-085		A6710	42932	48302	136568.8	575168.9	6		6	6	6	6	100	100	99.0	100	30.5	07/08/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-06-10	299-E27-071		A6696	42963	48291	136578.2	575172.2	6		6	6	6	6	130	130	129.3	130	39.6	11/16/72	F		E-Taped					X	X	XX	XX	XX	XX	XX
30-06-12	299-E27-086		A6711	42976	48260	136582.2	575181.6	6		6	6	6	6	100	100	99.6	100	30.5	08/05/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-01	299-E27-087		A6712	42911	48448	136562.3	575124.4	6		6	6	6	6	100	100	100.4	100	30.5	09/11/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-02	299-E27-088		A6713	42883	48419	136553.8	575133.3	6		6	6	6	6	100	100	99.1	100	30.5	09/10/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-05	299-E27-089		A6714	42823	48447	136535.4	575124.8	6		6	6	6	6	100	100	99.7	100	30.5	10/01/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-07	299-E27-090		A6715	42815	48485	136533.0	575113.2	6		6	6	6	6	100	100	98.8	100	30.5	10/03/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-08	299-E27-091		A6716	42842	48512	136541.2	575105.0	6		6	6	6	6	100		99.2	100	30.5	10/31/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-10	299-E27-092		A6717	42879	48515	136552.5	575104.0	6		6	6	6	6	100	100	98.8	100	30.5	09/06/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-07-11	299-E27-093		A6718	42904	48489	136560.1	575111.9	6		6	6	6	6	100	100	98.0	100	30.5	07/18/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-08-02	299-E27-094		A6719	42965	48363	136578.8	575150.3	6		6	6	6	6	100	100	99.7	100	30.5	09/20/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-08-03	299-E27-051	241-C-133	A6676	42932	48345	136568.8	575155.8	12	12/8	12	8	12	12/8	150	150	150.0	150	45.7	12/20/44	C1	Cement on bottom, Perforated 48' - 148'	E-Taped/12&8" Casing	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
30-08-12	299-E27-095		A6720	42978	48398	136582.7	575139.6	6		6	6	6	6	100	100	99.0	100	30.5	09/13/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-09-01	299-E27-096		A6721	43048	48313	136604.1	575165.4	6		6	6	6	6	100	100	99.3	100	30.5	07/29/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-09-02	299-E27-097		A6722	43023	48285	136596.5	575174.0	6		6	6	6	6	100	100	100.4	100	30.5	06/14/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-09-06	299-E27-098		A6723	42956	48327	136576.1	575161.2	6		6	6	6	6	100	100	98.5	100	30.5	09/16/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-09-07	299-E27-135		A6754	42965	48342	136578.8	575156.7	6		6	6	6	6	125	125	124.5	125	38.1	03/31/82	F	Grouted	E-Taped, Well Completion Report, 6&8" Casing, Pulled 8" Casing, Casing even w/Grade									XXC	XXC	XXC
30-09-10	299-E27-099		A6724	43024	48378	136596.8	575145.6	6		6	6	6	6	100	100	98.3	100	30.5	07/17/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-09-11	299-E27-100		A6725	43045	48349	136603.2	575154.5	6		6	6	6	6	100	100	98.8	100	30.5	07/25/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-10-01	299-E27-101		A6726	42979	48528	136582.9	575100.0	6		6	6	6	6	100	100	100.2	100	30.5	09/24/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-10-02	299-E27-102		A6727	42945	48494	136572.6	575110.4	6		6	6	6	6	100	100	99.2	100	30.5	09/04/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-10-09	299-E27-103		A6728	42926	48585	136566.7	575082.6	6	6	6	6	6	6	100	100	97.8	100	30.5	09/30/74	F		E-Taped						X	XX	XX	XX	XX	XX
30-10-11	299-E27-104		A6729	42967	48570	136579.2	575087.2	6	6	6	6	6	6	100	100	98.8	100	30.5	04/24/75	F		E-Taped						X	XX	XX	XX	XX	XX
30-11-01	299-E27-063	C-2	A6688	43036	48441	136600.4	575126.4	6		6	6	6	6	100	100	98.6	100	30.5	02/09/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
30-11-05	299-E27-105		A6730	42964	48438	136578.4	575127.4	6		6	6	6	6	100	100	100.1	100	30.5	04/21/75	F		E-Taped						XX	XX	XX	XX	XX	XX
30-11-06	299-E27-064	C-3	A6689	42957	48469	136576.3	575118.0	6		6	6	6	6	100	36	99.3	100	30.5	02/25/70	F		E-Taped, Hit Tank Footing, Moved 1 Foot					XX	XX	XX	XX	XX	XX	XX
30-11-09	299-E27-062	C-1	A6687	43002	48514	136589.9	575104.2	6		6	6	6	6	100	100	99.8	100	30.5	04/03/70	F		E-Taped					XX	XX	XX	XX	XX	XX	XX
30-11-11	299-E27-106		A6731	43043	48495	136602.5	575110.0	6	6	6	6	6	6	100	100	100.0	100	30.5	04/16/75	F		E-Taped						X	XX	XX	XX	XX	XX
30-12-01	299-E27-107		A6732	43120	48380	136626.0	575144.9	6	6	6	6	6	6	100	100	99.8	100	30.5	04/10/75	F		E-Taped						X	XX	XX	XX	XX	XX
30-12-03	299-E27-108		A6733	43088	48352	136616.3	575153.5	6	6	6	6	6	6	100	100	98.7	100	30.5	04/07/75	F		E-Taped						X	XX	XX	XX	XX	XX
30-12-09	299-E27-109		A6734	43074	48446	136611.9	575124.9	6	6	6	6	6	6	100	100	100.4	100	30.5	04/14/75	F		E-Taped, 6&8" Casing, Pulled 8" Casing, Casing even w/Grade						X	XX	XX	XX	XX	XX
30-12-11	NOT DRILLED																																
30-12-13	299-E27-125		A6745	43116	48387	136624.8	575142.8	6	6	6	6	6	6	130	130	120.7	130	39.6	04/25/78	F	Grouted	E-Taped, Well Completion Report, 6&8" Casing, Pulled 8" Casing, Casing even w/Grade								XXC	XXC	XXC	XXC

241 - S - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. SL #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)				m	DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled						HW-44355.0	HW-44355.1	HW-44355.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
40-00-02	299-W23-051	241-S-1	A7887	36175	75615	134487.2	566850.1	6		6	6	6	6	150	150	136.9	150	45.7	03/07/52	D	MIN-MAX PERFORATED DEPTH 40-100 FT / MAY HAVE HIT PERCHED ZONE, ANAL. RESULTS, PERFORATED ZONE.	E-TAPED	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXCC
40-00-04	299-W23-001	241-S-6 IBM 2898	A4979	35970	75615	134424.8	566850.3	4	6	4	4*6	4	4*6	262	262	219.0	262	79.9	06/04/52	B1	(IBM-2898, MIN. MAX. DEPTH OF PERFORATIONS 195-260 Obs.@ 175') (MIN-MAX PERFORATED DEPTH 150-260 FT, 5.6 SCREEN 180-235) (5.6 SCREEN 178-234) (4" TO 175 ft., D/BOTTOM AT 214')	4&6" CASING, PIPE IS 20" ABOVE GRADE	XX	XX	XX	XX	XXC	XXC	XXCCC	XXCCC	XXCCC	XXCCC	XXCCC
40-00-06	299-W23-056	241-S-7	A7892	35875	75722	134395.7	566817.7	6	6	6	6	5	6	175	150	151.0	150	45.7	04/25/52	D	MIN-MAX PERFORATED DEPTH 40-100 FT	E-TAPED, RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
40-01-01	299-W23-145		A7981	36266	75642	134515.0	566841.8	6	6	6	6	6	6	100	100	NA	100	30.5	09/29/71	F	DEEPENED 5/73	RESOURCE PROTECTION WELL REPORT					XX	XX	XXC	XXC	XXC	XXC	XXC
														130	130	129.0	130	39.6	05/25/73	F													
40-01-04	299-W23-179		A8015	36214	75620	134499.1	566848.6	6	6	6	6	6	6	100	100	100.0	100	30.5	03/05/74	F								X	XX	XX	XX	XX	XX
40-01-06	299-W23-146		A7982	36180	75665	134488.7	566834.9	6	6	6	6	6	6	100	100	100.0	100	30.5	09/29/71	F		RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-01-08	299-W23-147		A7983	36207	75707	134496.9	566822.1	6	6	6	6	6	6	100	100	100.0	100	30.5	10/01/71	F		RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-01-10	299-W23-180		A8016	36266	75695	134514.9	566825.7	6		6	6	6	6	100	100	98.0	100	30.5	03/21/74	F								X	XX	XX	XX	XX	XX
40-02-01	299-W23-148		A7984	36266	75744	134514.9	566810.7	6	6	6	6	6	6	100	100		100	30.5	09/01/71	F	DEEPENED 5/73	RESOURCE PROTECTION WELL REPORT					XX	XX	XXC	XXC	XXC	XXC	XXC
														130	130	128.0	130	39.6	05/29/73	F													
40-02-02	NA		NA	NA	NA	NA	NA	6	6	6	6	6	6	100	100	100.0	100		02/27/74	H	ABANDONED,CASING CUT OFF BELOW GRADE	(G) ABANDONED,NOT GAMMA LOGGED						X	XXC	XXC	XXC	XXC	XXC
40-02-03	299-W23-188		A8024	36249	75726	134509.7	566816.2	6	6	4	6	5	6	100	150	145.0	150	45.7	03/18/52	D	MIN-MAX PERFORATED DEPTH 40-100 FT	RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
40-02-04	299-W23-052	241-S-2	A7888	36186	75722	134490.5	566817.5	6			5	5	5	150		144.0	144	43.9	03/01/52	F		E-TAPED	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
40-02-05	299-W23-181		A8017	36183	75753	134489.6	566808.1	6		6	6	6	6	100	100	98.3	100	30.5	03/27/74	F		E-TAPED						X	XX	XX	XX	XX	XX
40-02-07	299-W23-149		A7985	36183	75783	134489.6	566798.9	6	6	6	6	6	6	100	100	95.9	100	30.5	09/30/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-02-08	299-W23-189		A8025	36204	75815	134495.9	566789.2	6	6	6	6	6	6	100	100	100.3	100	30.5	02/19/74	F		E-TAPED						X	XX	XX	XX	XX	XX
40-02-10	299-W23-150		A7986	36242	75810	134507.5	566790.6	6	6	6	6	6	6	100	100	100.4	100	30.5	10/04/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-02-11	299-W23-182		A8018	36271	75786	134516.4	566797.9	6		6	6	6	6	100	100	100.0	100	30.5	03/21/74	F								X	XX	XX	XX	XX	XX
40-03-01	299-W23-151		A7987	36266	75846	134514.8	566779.7	6	6	6	6	6	6	100	100	99.1	100	30.5	10/06/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-03-03	299-W23-212		A8046	36228	75823	134503.2	566786.7	6	6	6	6	6	6		130	125.0	130		06/06/78	F	GROUTED	GROUTED TB								XXC	XXC	XXC	XXC
40-03-05	299-W23-053	241-S-3	A7889	36186	75827	134490.4	566785.5	6	6	6	6	6	6	150	150	148.1	150	45.7	03/01/52	D	MIN-MAX PERFORATED DEPTH 40-100 FT	E-TAPED, WELL CASING 19" ABOVE GRADE, RESOURCE PROTECTION WELL	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
40-03-06	299-W23-152		A7988	36183	75885	134489.5	566767.8	6	6	6	6	6	6	100	100	99.0	100	30.5	10/04/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-03-08	299-W23-183		A8019	36200	75910	134494.6	566760.2	6		6	6	6	6	100	100	96.4	100	30.5	03/18/74	F		E-TAPED						X	XX	XX	XX	XX	XX
40-03-09	299-W23-153		A7989	36242	75912	134507.4	566759.6	6	6	6	6	6	6	100	100	130.0	100		10/06/71	F	DEEPENED 5/73	RESOURCE PROTECTION WELL REPORT, E-TAPED					XX	XX	XX	XXC	XXC	XXC	XXC
														130	130	130.0	130	39.6	05/16/73			E-TAPED											
40-03-11	299-W23-184		A8020	36271	75885	134516.3	566767.8	6		6	6	6	6	100	100	99.1	100	30.5	03/25/74	F		E-TAPED						X	XX	XX	XX	XX	XX
40-04-01	299-W23-123	241-S-2	A7959	36161	75636	134483.0	566843.7	6	6	6	6	6	6	100	100	98.3	100	30.5	06/05/70	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-04-05	299-W23-124	241-S-3	A7960	36090	75631	134461.3	566845.3	6		6	6	6	6	100	100		100	30.5	05/28/70	F	DEEPENED 5/73	RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XXC
														135	135	134.2	135	41.1	05/24/73			E-TAPED											
40-04-07	299-W23-122	241-S-1	A7958	36087	75694	134460.4	566826.1	6	6	6	6	6	6	100	100	97.0	100	30.5	06/10/70	F		RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-04-08	299-W23-177		A8013	36091	75698	134461.6	566825.0	6		6	6	6	6	50		47.0	50	15.2	NA	F								XX	XX	XX	XX	XX	XX
40-05-03	299-W23-154		A7990	36140	75724	134476.5	566816.9	6	6*8	6	5	5 DUP	6*8	100	100	100.0	100	30.5	10/14/71	F		6&8" CASINGS, WELL 6", RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-05-05	299-W23-054	241-S-4	A7890	36082	75722	134458.8	566817.6	6		6	5	5 DUP	5	150	150	145.8	150	45.7	04/17/52	D	MIN-MAX PERFORATED DEPTH 40-100 FT	E-TAPED	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
40-05-07	299-W23-155		A7991	36081	75783	134458.5	566799.0	6	6	6	6	6	6	100	100	97.0	100	30.5	10/22/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-05-08	299-W23-199		A8035	36111	75819	134467.6	566788.0	6	6	6	6	6	6	100	105	98.9	105	32.0	03/11/76	F		E-TAPED							XX	XX	XX	XX	XX
40-05-10	299-W23-156		A7992	36140	75810	134476.4	566790.7	6	6*8	6	6	6	6*8	100	105	89.8	105	32.0	04/13/71	F	GROUTED	6&8" CASINGS, WELL 6", RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX

241 - S - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. St. #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)				m	DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Reconciled	Report	Drill	Gamma	Reconciled						HW-44355.0	HW-44355.1	HW-44355.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8900
40-06-02	299-W23-157		A1993	36156	75837	134481.3	566782.5	6			6	6	6	100	100	100.1	100	30.5	10/22/71	F							XX	XX	XX	XX	XX	XX	XX
40-06-04	299-W23-213		A8047	36101	75829			6	6	6	6	6	6	130	130	123.0	130	39.6	06/01/78	F	GROUTED	WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
40-06-05	299-W23-055	241-S-5	A7891	36082	75827	134458.7	566785.6	6		6	6	6	6	150	150	140.7	150	45.7	04/01/52	D	MIN-MAX PERFORATED DEPTH 40-100 FT	E-TAPED	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
40-06-06	299-W23-158		A7994	36081	75885	134458.4	566767.9	6	6	6	6	6	6	100	100	97.0	100	30.5	11/25/71	F		WELL COMPLETION REPORT, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-06-08	299-W23-201		A8037	36102	75910	134464.8	566760.3	6	6	6	6	6	6	100	105	97.7	105	32.0	03/01/76	F		E-TAPED							XX	XX	XX	XX	XX
40-06-09	299-W23-159		A7995	36140	75912	134476.4	566759.6	6	6	6	6	6	6	100	100	99.6	100	30.5	10/25/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-07-01	299-W23-160		A7996	36062	75642	134452.8	566842.0	6	6	6	6	6	6	100	100	99.3	100	30.5	10/14/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-07-04	299-W23-185		A8021	36012	75620	134437.6	566848.7	6		6	6	6	6	100	100	102.3	100	30.5	03/25/74	F		E-TAPED						XX	XX	XX	XX	XX	XX
40-07-06	299-W23-161		A7997	35972	75663	134425.3	566835.7	6	6	6	6	6	6	100	100	98.6	100	30.5	10/08/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-07-08	299-W23-186		A8022	36000	75709	134433.8	566821.6	6		6	6	6	6	100	100	97.0	100	30.5	03/27/74	F								XX	XX	XX	XX	XX	XX
40-07-10	299-W23-162		A7998	36045	75705	134447.6	566822.8	6	6	6	6	6	6	100	100	98.5	100	30.5	10/08/71	F		RESOURCE PROTECTION WELL REPORT					XX	XX	XX	XX	XX	XX	XX
40-07-11	299-W23-187		A8023	36068	75678	134454.6	566831.0	6		6	6	6	6	100	100	98.1	100	30.5	04/03/74	F		E-TAPED						XX	XX	XX	XX	XX	XX
40-08-01	299-W23-178		A8014	36072	75747	134455.8	566810.0	6	6	6	6	6	6	100	105	97.5	105	32.0	03/06/76	F	(CHANGED TO W23-12) (MAY HAVE HIT PERCHED ZONE, ANAL. RESULTS)	E-TAPED						XX	XXC	XXC	XXC	XX	XXC
40-08-06	299-W23-163		A7999	35979	75767	134427.4	566804.0	6	6	6	6	6	6	100	100	99.7	100	30.5	11/04/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					XX	XX	XXC	XX	XX	XX	XX
40-08-08	299-W23-202		A8038	35990	75799	134430.7	566794.2	6	6	6	6	6	6	100	105	98.1	105	32.0	02/28/76	F		E-TAPED							XXC	XX	XX	XX	XX
40-08-09	299-W23-164		A8000	36026	75813	134441.7	566789.9	6		6	6	6	6	100	100	95.3	100	30.5	10/18/71	F		E-TAPED					XX	XX	XX	XX	XX	XX	XX
40-08-12	299-W23-216		A8048	36070	75767	134455.1	566803.9	6	6	6	6	6	6	130	130	123.8	130	39.6	06/20/71	F	GROUTED	E-TAPED/ WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
40-09-01	299-W23-200		A8036	36072	75859	134455.7	566775.8	6	6	6	6	6	6	100	105	96.5	105	32.0	03/15/76	F		E-TAPED							XX	XX	XX	XX	XX
40-09-02	299-W23-165		A8001	36054	75837	134450.2	566782.6	6		6	6	6	6	100	100	98.2	100	30.5	10/20/71	F		E-TAPED					XX	XX	XX	XX	XX	XX	XX
40-09-05	299-W23-057	241-S-8	A7893	35980	75827	134427.7	566785.7	6		6	6	6	6	175	150	141.7	150	45.7	04/09/52	D	(MIN-MAX PERFORATED DEPTH 40-100 FT) (MAY HAVE HIT PERCHED ZONE, ANAL. RESULTS, PERFORATED ZONE)	E-TAPED, RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXCC
40-09-06	299-W23-166		A8002	35977	75877	134426.7	566770.4	6		6	6	6	6	100	100	98.5	100	30.5	10/26/71	F		E-TAPED					XX	XX	XX	XX	XX	XX	XX
40-09-08	299-W23-203		A8039	35995	75907	134432.2	566761.3	6	6	6	6	6	6	100	100	97.9	100	30.5	03/11/76	F		E-TAPED							XX	XX	XX	XX	XX
40-09-09	299-W23-167		A8003	36038	75912	134445.3	566759.7	6		6	6	6	6	100	100		100	30.5	10/27/71	F	DEEPENED 5/73	E-TAPED					XX	XX	XXC	XXC	XXC	XXC	XXC
														140	140	138.2	140	42.7	05/14/73															
40-10-01	299-W23-012		A4981 Perforated 0-20', 90-175', 185 189'	35969.1	75625.1	134424.5	566847.2	6	4*6	4	6	4	4*6	265	265	209.7	265	80.8	10/01/70	B1	(SEE W23-178) (4 IN 0-175 PERF 0-20 90-170) (GROUTED/ PERF 0-209, GROUTED 0-170) BACKFILLED 232-218'	E-TAPED/ 4&6" CASING, (G) 4" CASING, PROBLEM TO GAMMA LOG WELL W/ 4" CASING, TOOL HANGS UP ON CASING							XXCC	XXCC	XXCCC	XXCCC	XXCCC
40-10-03	299-W23-168		A8004	35924	75619	134410.8	566849.1	6		6	6	6	6	100	100	98.0	100	30.5	11/16/71	F		E-TAPED					XX	XX	XX	XX	XX	XX	XX
40-10-05	299-W23-204		A8040	35880	75632	134397.3	566845.2	6	6	6	6	6	6	100	105	97.8	105	32.0	03/18/76	F		E-TAPED							XX	XX	XX	XX	XX
40-10-06	299-W23-169		A8005	35874	75665	134395.5	566835.1	6		6	6	6	6	100	100		100	30.5	11/10/71	F	DEEPENED 5/73	E-TAPED					XX	XX	XXC	XXC	XXC	XXC	XXC
														145	140	144.3	140	42.7	05/22/73															
40-10-08	299-W23-205		A8041	35882	75687	134397.9	566828.4	6	6	6	6	6	6	100	105	100.1	105	32.0	03/23/76	F		E-TAPED							XX	XX	XX	XX	XX
40-10-09	299-W23-170		A8006	35924	75711	134410.7	566821.1	6		6	5	5	5	100	100	100.0	100	30.5	11/11/71	F							XX	XX	XX	XX	XX	XX	XX
40-10-13	299-W23-218		A8049	35959	75642	134421.4	566842.1	6	6	6	6	6	6	130	130	124.3	130	39.6	07/01/78	F	GROUTED	E-TAPED/ WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
40-11-01	299-W23-171		A8007	35960	75744	134421.6	566811.0	6		6	6	6	6	100	100		100	30.5	11/09/71	F	DEEPENED 5/73	E-TAPED					XX	XX	XXC	XXC	XXC	XXC	XXC
														145	145	145.2	145	44.2	05/18/73															
40-11-05	299-W23-206		A8042	35875	75747	134395.7	566810.1	6	6	6	6	6	6	100	105	98.5	105	32.0	02/27/76	F		E-TAPED							XX	XX	XX	XX	XX
40-11-07	299-W23-172		B2900	35877	75783	134396.3	566799.2	6			6	6	6	100	100		100	30.5	11/08/71	F							XX	XX	XX	XX	XX	XX	XX
40-11-08	299-W23-207		A8043	35900	75815	134403.3	566789.4	6	6	6	6	6	6	100	105		105	32.0	03/02/76	F									XX	XX	XX	XX	XX
40-11-09	299-W23-173		A8008	35936	75810	134414.3	566790.9	6		6	6	6	6	100	100	99.2	100	30.5	10/29/71	F		E-TAPED					XX	XX	XX	XX	XX	XX	XX
40-12-02	299-W23-174		A8009	35952	75837	134419.1	566782.6	6		6	6	6	6	100	100	99.5	100	30.5	10/28/71	F							XX	XX	XX	XX	XX	XX	XX
40-12-04	299-W23-220		A8050	35897	75869	134402.3	566772.9	6		6	6	6	6	130	130	126.0	130	39.6	06/28/78	F	GROUTED	WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
40-12-06	299-W23-175		A8010	35874	75869	134395.3	566772.9	6		6	6	6	6	100	100		100	30.5	11/03/71	F	DEEPENED 5/73						XX	XX	XXC	XXC	XXC	XXC	XXC
														145	145	143.0	145	44.2	05/18/73															
40-12-07	299-W23-208		A8044	35885	75901	134398.7	566763.2	6	6	6	6	6	6	100	105	98.5	105	32.0	03/06/76	F									XX	XX	XX	XX	XX
40-12-09	299-W23-176		A8011	35924	75915	134410.5	566758.9	6		6	6	6	6	100	100	99.0	100	30.5	11/29/71	F							XX	XX	XX	XX	XX	XX	XX

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WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355,0	HW-44355,1	HW-44355,2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
41-00-02	299-W23-061	241-SX-4	A7897	35520	75600	134287.6	566855.2	6		6	8.125		8	102	102	97.2	102	31.1	09/23/54	E	MIN. & MAX.PERFORATED DEPTH, 10-99 ft	E-TAPED,RESOURSE PROTECTION WELL REPORT (DEPTH=98.2 FT)	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
41-00-03	299-W23-002	241-SX-5, IBM-2910, EMA-2910	A4985	35425	75605	134258.7	566854.1	4	4*8	4	8		4*8	236	236	223.1	236	71.9	09/09/54	BI	MIN. & MAX.PERFORATED DEPTH,184-235 ft 4 IN, 0-175 ft, PERF 0-20 90-170, GROUTED (PERF 0-209, GROUTED 0-170)	E-TAPED, WL=190 (6/6/75), WELL CONSTR. DETAILS, 4&8" CASING (8" WELL), WELL COMPLETION ASBUILT,RESOURCE PROTECTION WELL	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXCC	XXCC	XXC
41-00-04	299-W23-005		A4988	35200	75550	134190.2	566870.7	4	4*8	4	4/8	4*8	4*8	250	253	200.1	250	76.2	10/02/69	BI	MIN. & MAX.PERFORATED DEPTH,170-245 ft 4 IN 0-165 ft PERF 0-20 90-160, GROUTED (PERF 0-209 GROUTED 0-160)	E-TAPED, WELL COMPLETION ASBUILT, 4&8" CASING (8" WELL), RESOURCE PROTECTION WELL.					XXC	XXC	XXC	XXC	XXCC	XXCC	XXC
41-00-05	299-W23-003	241-SX-12, IBM 2911 EMA-2911	A4986	35110	75615	134162.7	566851.2	4	4*8	4	10	4*8	4*8	232	232	215.0	232	70.7	02/28/56	BI	MIN. & MAX.PERFORATED DEPTH,176-228 ft 4 IN 0-170 ft PERF 0-20 90-165, GROUTED (PERF 0-209 GROUTED 0-165	E-TAPED, WELL COMPLETION ASBUILT, 4&8" CASING (8" WELL), RESOURCE PROTECTION WELL.	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXCC	XXCC	XX
41-00-06	299-W23-232		NA	34983	75803	134123.8	566793.7		6*12		6*12	5	6*12			68	68	20.7	08/08/96	F		6&12" CASING,(G) WELL LOCATED APPROX. 21 FT SOUTH OF 299-W23-15											
41-00-08	299-W23-065	241-SX-8	A7901 -	35007	75923	134219.4	566756.9	8	8	8	8	8	8	125	125	124.4	125	38.1	03/14/56	FI		E-TAPED	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
41-01-01	299-W23-132		A7968	35590	75643	134308.9	566842.0	6		6	6	5	6	100	100	N/A	100	30.5	03/21/72	FI	DEEPENED 5/73						XX	XX	XXC	XXC	XXC	XXC	XXC
														140	140	140.0	140	42.7	05/03/73			(G) CHAIN DEPTH											
41-01-04	299-W23-190		A8026	35527	75628	134289.8	566846.7	6		6	6.25	6	6	100	100	101.0	100	30.5	11/01/74	F		E-TAPED						x	XX	XX	XX	XX	XX
41-01-06	299-W23-133		A7969	35508	75665	134283.9	566835.4	6		6	6.125	6	6	100	100	96.9	100	30.5	12/27/71	F		E-TAPED,RESOURCE PROTECTION REPORT					XX	XX	XX	XX	XX	XX	XX
41-01-07	299-W23-060	241-SX-3	A7896	35520	75717	134287.6	566819.5	8	8	8	8	8	8	101	101	100.0	101	30.8	09/21/54	E	MIN. & MAX.PERFORATED DEPTH, 10-99 ft	E-TAPED,RESOURCE PROTECTION REPORT	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
41-01-08	299-W23-134		A7970	35534	75705	134291.8	566823.2	6		6	6.125	6	6	100	100	100.8	100	30.5	01/03/72	F		RESOURCE PROTECTION WELL/ DEPTH MEASURED					XX	XX	XX	XX	XX	XX	XX
41-01-10	299-W23-191		A8027	35567	75711	134301.9	566821.3	6	6*8	6	6.125	6	6*8	100	100	100.3	100	30.5	11/20/74	F		E-TAPED,6&8" CASING						x	XX	XX	XX	XX	XX
41-01-11	299-W23-192		A8028	35592	75680	134309.5	566830.8	6	6	6	6.125	6	6	100	100	100.3	100	30.5	11/18/74	F		E-TAPED,RESOURCE PROTECTION REPORT						x	XX	XX	XX	XX	XX
41-02-02	299-W23-135		A7971	35590	75745	134308.9	566811.0	6	6	6	6.125	6	6	100	100		100	30.5	01/14/72	F	DEEPENED 5/73	E-TAPED,RESOURCE PROTECTION REPORT					XX	XX	XXC	XXC	XXC	XXC	XXC
														140	140	139.6	140	42.7	05/07/73														
41-02-05	299-W23-223		A8051	35509	75747	134284.2	566810.4	6	6	6	6.125	6	6	130	130	125.2	130	39.6	07/31/78	F	GROUTED, CEMENT PLUG 125-130 ft, 0-18 ft	E-TAPED,GROUTED, WELL COMPLETION REPORT,RESOURCE PROTECTION REPORT								XXC	XXC	XXC	XXC
41-02-07	299-W23-059	241-SX-2	A7895	35520	75808	134287.5	566791.8	8	8	8	8	6	8	101	101	99.2	101	30.8	09/16/54	E	MIN. & MAX.PERFORATED DEPTH, 10-99 ft	RESOURCE PROTECTION REPORT, DEPTH MEASURED	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
41-02-08	299-W23-136		A7972	35548	75811	134296.0	566790.9	6	6	6	6	6	6	100	100	98.6	100	30.5	01/18/72	F		E-TAPED,RESOURCE PROTECTION WELL, DEPTH MEASURED					XX	XX	XX	XX	XX	XX	XX
41-02-11	299-W23-193		A8029	35590	75795	134308.8	566795.7	6		6	6.125	6	6	100	100	94.9	100	30.5	10/28/74	F		RESOURCE PROTECTION REPORT, DEPTH MEASURED						x	XX	XX	XX	XX	XX
41-03-02	299-W23-194		A8030	35578	75832	134305.1	566784.4	6	6	6	6	6	6	100	100	98.8	100	30.5	10/30/74	F		RESOURCE PROTECTION REPORT, DEPTH MEASURED						x	XX	XX	XX	XX	XX
41-03-05	299-W23-195		A8031	35520	75833	134287.5	566784.2	6	6	6	6.25	6	6	100	100	100.2	100	30.5	11/25/74	F		E-TAPED,RESOURCE PROTECTION REPORT						x	XX	XX	XX	XX	XX
41-03-06	299-W23-138		A7974	35508	75869	134283.8	566773.2	6	6	6	6.25	6	6	100	100	99.1	100	30.5	02/17/72	F		E-TAPED,RESOURCE PROTECTION REPORT					XX	XX	XX	XX	XX	XX	XX
41-03-09	299-W23-139		A7975	35548	75913	134295.9	566759.8	6	6	6	6	6	6	100	100	99.1	100	30.5	02/11/72	F		E-TAPED,RESOURCE PROTECTION REPORT					XX	XX	XX	XX	XX	XX	XX
41-03-10	299-W23-196		A8032	35582	75900	134306.3	566763.7	6	6	6	6	6	6	100	100		100	30.5	10/25/74	F		E-TAPED,RESOURCE PROTECTION REPORT						x	XX	XX	XX	XX	XX
41-03-12	299-W23-137		A7973	35596	75869	134310.6	566773.2	6	6	6		6	6	100	100		100	30.5	01/24/72	F	DEEPENED 5/73	RESOURCE PROTECTION REPORT					XX	XX	XXC	XXC	XXC	XXC	XXC
														140	140		140	42.7	05/01/73														
41-04-01	299-W23-140		A7976	35488	75641	134277.9	566842.7	6	6	6	6	6	6	100	100	99.0	100	30.5	03/15/72	F		E-TAPED,RESOURCE PROTECTION REPORT					XX	XX	XX	XX	XX	XX	XX
41-04-03	299-W23-197		A8033	35452	75616	134266.9	566850.4	6	6	6	6.125	6	6	100	100	100.0	100	30.5	11/12/74	F		E-TAPED,RESOURCE PROTECTION REPORT						x	XX	XX	XX	XX	XX
41-04-05	299-W23-198		A8034	35412	75639	134254.7	566843.4	6	6	6	6	6	6	100	100	100.5	100	30.5	11/14/74	F		E-TAPED,RESOURCE PROTECTION REPORT						x	XX	XX	XX	XX	XX
41-04-07	299-W23-062	241-SX-6	A7898	35405	75695	134252.5	566826.3	6	6	6	8	6	6	101	101	99.3	101	30.8	09/29/54	E	MIN. & MAX.PERFORATED DEPTH, 10-99 ft	E-TAPED,RESOURCE PROTECTION REPORT	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
41-04-08	299-W23-225		A8052	35427	75704	134259.2	566823.6	6	6	6	6	6	6	130	130	123.5	130	39.6	04/04/78	F	GROUTED	E-TAPED,RESOURCE PROTECTION REPORT									XXC	XXC	XXC
41-04-11	299-W23-141		A7977	35486	75689	134277.2	566828.2	6	6	6	6	6	6	100	100	102.4	100	30.5	03/09/72	F		E-TAPED,RESOURCE PROTECTION REPORT					XX	XX	XX	XX	XX	XX	XX
41-05-02	299-W23-130		A7966	35475	75726	134273.8	566816.8	6	6	6	6	6	6	75			75	22.9	02/01/62	F	DEEPENED AND GROUTED 9/78	(G) GROUT T&B, WELL COMPLETION REPORT					x	x	XX	XXC	XXC	XXC	XXC
														130	130	130.0	130	39.6	09/20/78														

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WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8900
41-05-03	299-W23-131		A7967	35440	75720	134263.2	566818.7	6	8	6	6	6	6	75	75		75	22.9	02/01/62	F	DEEPENED AND GROUTED 9/78	E-TAPED, (G) GROUT T&B, WELL COMPLETION REPORT					x	x	XX	XXC	XXC	XXC	XXC
														130	130	123.2	130	39.6	09/18/78															
41-05-05	299-W23-125		A7961	35405	75750	134252.5	566809.6	6		6	6.25	6	6	75	75	75.0	75	22.9	03/30/70	F	DEEPENED 4/73						x	x	XXC	XXC	XXC	XXC	XXC
														135	135	132.2	135	41.1	04/03/73															
41-05-07	299-W23-126	-	A7962	35410	75792	134254.0	566796.8	6	6	6	6	6	6	75	75		75	22.9	02/01/62	F	DEEPENED AND GROUTED 8/78	GROUTED T&B, WELL COMPLETION REPORT					x	x	XX	XXC	XXC	XXC	XXC
														130	130	126.0	130	39.6	08/03/78															
41-05-08	299-W23-127		A7963	35444	75817	134264.3	566789.1	6	6	6	6	6	6	75			75	22.9	02/01/62	F	DEEPENED AND GROUTED 8/78	E-TAPED, GROUT T&B, WELL COMPLETION REPORT					x	x	XX	XXC	XXC	XXC	XXC
														130	130	124.7	130	39.6	08/30/78			HIT BOTTOM @ 124.3												
41-05-10	299-W23-128		A7964	35475	75809	134273.8	566791.5	6	6	6	6.125	6	6	75	75		75	22.9	02/01/62	F	DEEPENED AND GROUTED 9/78	E-TAPED, GROUT T&B, WELL COMPLETION REPORT					x	x	XX	XXC	XXC	XXC	XXC
														130	130	124.5	130	39.6	09/01/78															
41-05-12	299-W23-129		A7965	35498	75760	134280.8	566806.5	6	6	6	6	6	6	75	75		75	22.9	02/01/62	F	DEEPENED AND GROUTED 9/78	E-TAPED, GROUT T&B, WELL COMPLETION REPORT					x	x	XX	XXC	XXC	XXC	XXC
														130	130	124.2	130	39.6	09/22/78	F														
41-06-02	299-W23-142		A7978	35488	75847	134277.7	566779.9	6	6	6	6	6	6	100	100	99.8	100	30.5	03/02/72	F		E-TAPED					X	XX	XX	XX	XX	XX	XX
41-06-05	299-W23-143		A7979 -	35449	75838	134256.7	566782.7	6		6	6.1875	6	6	100	100		100	30.5	03/21/72	F	DEEPENED 3/73	GROUT T&B					X	XX	XX	XX	XX	XX	XXC
														140	140	138.0	140	42.7	03/29/73															
41-06-06	299-W23-226		A8053	35404	75869	134252.1	566773.3	6	6	6	6.125	6	6	130	130	122.6	130	39.6	04/18/78	F	GROUTED	E-TAPED, GROUT T&B, WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
41-06-09	299-W23-144		A7980	35446	75913	134264.9	566759.9	6		6	6.125	6	6	100	100	97.1	100	30.5	03/24/72	F		E-TAPED					X	XX	XX	XX	XX	XX	XX
41-06-11	299-W23-058	241-SX-1	A7894	35501	75900	134281.6	566763.8	8		8	8	8	8	101	101	101.0	101	30.8	09/13/54	E	MIN. & MAX.PERFORATED DEPTH, 10-99 ft		XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC
41-06-23	299-W23-227		A8054	35489	75891	134277.97	566766.54	6	6	6	6	6	6	130	130	124.5	130	39.6	05/02/78	F	GROUTED	E-TAPED, GROUT T&B, WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
41-07-02	299-W23-074		A7910	35383	75631	134245.9	566845.9	8		8	6	8	6	75	75	76.5	75	22.9	02/19/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-07-03	299-W23-075		A7911	35344	75617	134234.0	566850.2	8		8	6	8	6	75	75	75.0	75	22.9	02/20/62	F					XX	XX	XX	XX	XX	XX	XX	XX	XX
41-07-05	299-W23-076		A7912	35308	75639	134223.0	566843.5	8		8	8	8	6	75	63	77.0	63	19.2	02/19/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-07-07	299-W23-077		A7913	35302	75681	134221.1	566830.7	8	6	8	6	8	6	75	75	74.5	75	22.9	02/20/62	F					XX	XX	XX	XX	XX	XX	XX		XX
41-07-08	299-W23-078		A7914	35332	75711	134230.3	566821.5	8		8	6	8	6	75	75	77.0	75	22.9	02/22/62	F					XX	XX	XX	XX	XX	XX	XX		XX
41-07-10	299-W23-079		A7915	35374	75706	134243.1	566823.0	8		8	8	8	6	75	75	75.0	75	22.9	02/23/62	F					XX	XX	XX	XX	XX	XX	XX		XX
41-07-12	299-W23-073		A7909	35397	75668	134250.1	566834.6	8	4*6	8	6	8	4*6	75	75		75	22.9	02/15/62	G1	DEEPENED AND GROUTED 9/78, 4" CASING TO 88 FT	4&6" CASING, GROUT T&B, WELL COMPLETION REPORT			XX	XX	XX	XX	XX	XXC	XXC	XXC	XXCC
														90	90	88.0	90	27.4	09/23/78															
41-08-02	299-W23-102		A7938	35390	75744	134247.9	566811.4	8		8	8	8	8	75	75	75.0	75	22.9	03/16/62	F1						XX	XX	XX	XX	XX	XX	XX	XX
41-08-03	299-W23-103		A7939	35355	75719	134237.3	566819.1	8		8	6.125	8	6	75	75	74.5	75	22.9	03/16/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-08-04	299-W23-098		A7934	35316	75731	134225.4	566815.4	8		8	6	8	6	75	75	76.8	75	22.9	03/14/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-08-06	299-W23-099		A7935	35300	75767	134220.5	566804.5	8		8	6	8	6	75	135	133.4	135	41.1	03/12/62	F	DEEPENED 4/73	E-TAPED				XX	XX	XX	XX	XX	XX	XXC	XXC
41-08-07	299-W23-100		A7936	35318	75804	134225.9	566793.2	8			6	N/F	6	75	75	73.8	75	22.9	03/16/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-08-11	299-W23-101		A7937	35391	75789	134243.2	566797.7	8		8	6.125	8	6	75	75	75.3	75	22.9	03/15/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-09-02	299-W23-110		A7946	35391	75847	134248.1	566780.0	8		8	6	8	6	75	75	73.5	75	22.9	03/23/62	F						XX	XX	XX	XX	XX	XX	XX	XX
41-09-03	299-W23-104		A7940	35356	75821	134237.5	566788.0	8		8	6	8	6	75	75	73.9	75	22.9	03/19/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-09-04	299-W23-105		A7941	35317	75833	134225.6	566784.3	8		8	6	8	6	100	105	105.0	105	32.0	03/21/62	F	DEEPENED TO 105 FT. 2/1/73					XX	XX	XX	XX	XX	XX	XX	XX
41-09-06	299-W23-106		A7942	35297	75872	134219.5	566772.5	8		8	6.125	8	6	75	75	75.0	75	22.9	03/20/62	F						XX	XX	XX	XX	XX	XX	XX	XX
41-09-07	299-W23-107		A7943	35319	75907	134226.2	566761.8	8		8	6	8	6	75	75	75.0	75	22.9	03/22/62	F						XX	XX	XX	XX	XX	XX	XX	XX
41-09-09	299-W23-108		A7944	35360	75915	134238.6	566759.3	8		8	6	8	6	75	75		75	22.9	03/22/62	F	DEEPENED 3/73					XX	XX	XX	XXC	XXC	XXC	XXC	XXC
														130	130	126.7	130	39.6	03/27/73			E-TAPED												
41-09-11	299-W23-109		A7945	35392	75889	134248.4	566767.2	8		8	6	8	6	75	75	73.9	75	22.9	03/23/62	F						XX	XX	XX	XX	XX	XX	XX	XX
41-09-39	299-W23-234		B2828	35319	75828	134226.2	566785.9				12	12	12				225	68.6	06/01/96	1		BACKFILLED & DECOMMISIONED PER (ECN-628819)												
41-10-01	299-W23-080		A7916	35290	75645	134217.5	566841.7	8		8	6.125	8	6	75	75		75	22.9	02/23/62	F	DEEPENED 4/73				XX	XX	XX	XX	XXC	XXC	XXC		XXC
														135	135	135.0	135	41.1	04/25/73															
41-10-02	299-W23-066	241-SX-9	A7902	35271	75614	134211.7	566851.1	8	8	8	8	8	8	126	126	126.0	126	38.4	03/01/56	F1			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
41-10-03	299-W23-081		A7917	35242	75617	134202.9	566850.2	8		8	6	8	6	75	75	75.0	75	22.9	02/23/62	F					XX	XX	XX	XX	XX	XX	XX		XX
41-10-05	299-W23-082		A7918	35206	75638	134191.9	566843.9	8		8	6.125	8	6	75	75	74.9	75	22.9	02/26/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-10-06	299-W23-083		A7919	35199	75675	134189.8	566832.6	8		8	6	8	6	75	75	75.0	75	22.9	02/27/62	F					XX	XX	XX	XX	XX	XX	XX		XX
41-10-08	299-W23-084		A7920	35227	75709	134198.3	566822.2	8		8	6	8	6	75	75	74.1	75	22.9	02/27/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-10-10	299-W23-067	241-SX-10	A7903	35273	75710	134212.3	566821.9	8	8	8	8	8	8	125	126	124.5	126	38.4	03/16/56	F1		E-TAPED	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
41-10-11	299-W23-085		A7921	35287	75690	134216.6	566827.9	8		8	6.125	8	6	75	75	75.5	75	22.9	03/01/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX		XX
41-11-02	299-W23-096		A7932	35286	75741	134216.2	566812.4	8		8	6	8	6	75	75	75.5	75	22.9	03/14/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-11-03	299-W23-097		A7933	35253	75719	134206.2	566819.1	8		8	6	8	6	75	75	75.0	75	22.9	03/15/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-11-05	299-W23-092		A7928	35209	75736	134192.8	566814.0	8		8	6	8	6	75	75		75	22.9	03/08/62	F	DEEPENED 4/73	E-TAPED			XX	XX	XX	XX	XX	XX	XX	XXC	XXC
														135	135	135.0	135	41.1	04/19/73															
41-11-06	299-W23-093		A7929	35194	75767	134188.2	566804.6	8		8	6	8	6	75	75	75.4	75	22.9	03/08/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-11-08	299-W23-094		A7930	35217	75805	134195.1	566793.0	8		8	8	8	8	75	75		75	22.9	03/09/62	F1	DEEPENED 4/73	E-TAPED			XX	XX	XX	XX	XX	XX	XX	XXC	XXC
														135	135	134.5	135	41.1	04/11/73															
41-11-09	299-W23-095		A7931	35253	75814	134206.1	566790.2	8		8	6	8	6	75	75	75.6	75	22.9	03/12/62	F		E-TAPED				XX	XX	XX	XX	XX	XX	XX	XX
41-11-10	299-W23-064	241-SX-7	A7900	35287	75810	134216.5	566791.4	8	8	8	8	8	8	125	125	124.3	125	38.1	03/07/56	F1		E-TAPED	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

241 - SX - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS	Wa. STATE #	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
41-12-01	299-W23-233		B2827	35289	75838	134217.1	566782.8	6	7*12	6	7	N/F	7*12		126	126.0	126	38.4	08/12/96	F		WA. WATER WELL REPORT, 7&12" CASING											
41-12-02	299-W23-111		A7947	35277	75832	134213.4	566784.7	8		8	6	8	6	120	75		75	22.9	03/26/62	F	Deepend 1/72				XX	XX	XX	XX	XX	XX	XX	XX	XX
															125	125.0	125	38.1	01/25/72														
41-12-03	299-W23-112		A7948	35229	75824	134198.8	566787.2	8		8	6	8	6	75	75	75.0	75	22.9	03/26/62	F					XX	XX	XX	XX	XX	XX	XX	XX	XX
41-12-04	299-W23-068	241-SX-11	A7904	35206	75829	134191.8	566785.6	8	8	8	8	8	8	125	125	123.3	125	38.1	03/10/56	F1		E-TAPED	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
41-12-06	299-W23-113		A7949	35195	75865	134188.4	566774.7	8		8	6	8	6	75	75	73.3	75	22.9	03/27/62	F					XX	XX	XX	XX	XX	XX	XX	XX	XX
41-12-07	299-W23-114		A7950	35206	75895	134191.7	566765.5	8		8	6	8	6	75	75	73.4	75	22.9	04/04/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-12-09	299-W23-115		A7951	35234	75915	134200.2	566759.4	8		8	6	8	6	75	75	75.7	75	22.9	03/27/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-12-10	299-W23-116		A7952	35272	75909	134211.8	566761.2	8		8	6	8	6	75	75	75.0	75	22.9	03/29/62	F					XX	XX	XX	XX	XX	XX	XX	XX	XX
41-12-1A	NA		NA	NA	NA						6	N/F	6			20.3	20.3	6.2	NA	H		ABANDONED, SEE 41-12-01											
41-13-10	299-W23-072		A7908	35176.9	75705.1	134183.0	566823.4	8	6	8	6	8	6	100	100	97.7	100	30.5	10/06/58	F		E-TAPED			XX	X	X	X	XX	XX	XX	XX	XX
41-14-02	299-W23-091		A7927	35175	75730	134182.4	566815.8	8		8	6	8	6	75	75	76.7	75	22.9	03/09/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-14-03	299-W23-086		A7922	35131	75720	134169.0	566818.9	8		8	6	8	6	75	75	75.0	75	22.9	03/01/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX		XX
41-14-04	299-W23-069	241-SX-13	A7905	35102	75737	134160.1	566813.8	8	8	8	8	8	8	125	125	123.7	125	38.1	03/20/56	F1	MAY HAVE HIT PERCHED ZONE, ANAL. RESULTS 241-SX-13	E-TAPED		XX	XX	XX	XX	XX	XX	XX	XX	XX	XXC
41-14-06	299-W23-087		A7923	35096	75773	134158.3	566802.8	8			6	6	6	75	75	76.0	75	22.9	03/02/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX		XX
41-14-08	299-W23-088		A7924	35112	75803	134163.1	566793.6	8		8	6	8	6	75	60	74.0	60	18.3	03/02/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-14-09	299-W23-089		A7925	35151	75815	134175.0	566790.0	8		8	6	8	6	75	75	75.0	75	22.9	03/06/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-14-11	299-W23-090		A7926 -	35182	75796	134184.5	566795.7	8		8	6	8	6	75	75	75.0	75	22.9	03/06/62	F					XX	XX	XX	XX	XX	XX	XX	XX	XX
41-15-02	299-W23-117		A7953	35168	75827	134180.2	566786.3	8		8	6	8	6	75	75	74.4	75	22.9	03/29/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-15-03	299-W23-118		A7954	35126	75824	134167.4	566787.2	8		8	6	8	6	75	75	75.5	75	22.9	04/02/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-15-05	299-W23-119		A7955	35098	75854	134158.8	566778.1	8		8	6	8	6	75	75	73.8	75	22.9	03/30/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-15-07	299-W23-070	241-SX-14	A7906	35099	75894	134159.1	566765.9	8		8	8	8	8	125	125	124.4	125	38.1	03/27/56	F1		E-TAPED		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
41-15-09	299-W23-120		A7956	35134	75916	134169.8	566759.2	8		8	6	8	6	75	75	74.5	75	22.9	04/03/62	F		E-TAPED			XX	XX	XX	XX	XX	XX	XX	XX	XX
41-15-10	299-W23-121		A7957	35177	75904	134182.9	566762.8	8		8	6	8	6	75	75		75	22.9	04/03/62	F	DEEPENED 4/73	E-TAPED			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
														125	125	124.5	125	38.1	04/30/73															
W23-7	299-W23-007		A4990	35700	75550	134342.54	566870.3	6	4*6		6	6	4*6	250	250		250	76.2	11/01/69	B	MIN. & MAX.PERFORATED DEPTH,170-248 ft 4 IN 0-165 ft PERF 0-20 90-160, GROUTED (PERF 0-209 GROUTED 0-160)	WELL COMPLETION ASBUILT, 4&8" CASING (8" WELL), RESOURCE PROTECTION WELL,					XXC	XXC	XXC	XXC	XXCC	XXCC	XXCC
NA	NA		B8809	35124	75916	134166.72	566759.2						NA				225		NA	B		REFERENCE ECN 654124											

241 - T - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilled	Report	Drill	Gamma	Recon-cilled	m					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1951	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8900
	299-W10-003	221-T-15	A4897	43348	75980	136673.01	566733.4		6*8		8		6*8		75		75		9/26/47		Deepend 10/51												
															239	229.9	239		11/1/51	B	(6" SCREEN,181-234 FT),(MIN-MAX PERF DEPTH,FT ,194-230)	E-TAPED, 6&8" CASING, RESOURCES PROTECTION REPORT, WELL CONSTR. ASBUILT	XX									XXCC	
50-00-01	299-W10-008	2997	A4899	43800	75600	136811.1	566848.9	6	6		6	N/F	6	251	251	246.2	251	76.5	06/25/73	B	(SCREEN 211-251 FT),(MIN-MAX PERF DEPTH,FT ,205-251)	RESOURCE PROTECTION WELL/ E-TAPED/ WELL DETAILS						XXCC	XXCC	XXCC	XXCC	XXCC	XXCC
50-00-02	299-W11-023		A4905	43766	75416	136801.1	566905.3	6	6		6	N/F	6	240	252	252.0	252	76.8	07/15/73	B	MIN-MAX PERF. 200-240 FT	RESOURCE PROTECTION WELL/ WELL DETAILS						XX	XX	XX	XX	XXC	XX
50-00-03	299-W11-051	241-T-131, T-133,10-51	A7291	43648	75577	136764.7	566856.0	6	12/10/8/6	6	4	4	12/10/8/6	150	148	139.5	148	45.1	09/13/44	A	MIN-MAX PERF. 50-150 FT	E-TAPED, 6,8,10,12" CASINGS	XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
50-00-05	299-W11-053	241-T-135	A7294	43348	75577	136673.3	566856.2	6	12/10/8/6	6	4	6	12/10/8/6	150	150	137.9	150	45.7	09/21/44	A	MIN-MAX PERF. 50-150 FT	E-TAPED, 6,10,12" CASINGS	XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
50-00-06	299-W10-055	241-T-136	A7145	43272	75700	136631.8	566818.8	6	6	5	5	5	5*12/6	150	150	147.7	150	45.7	09/29/44	A	MIN-MAX PERF. 50-150 FT	E-TAPED	XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
50-00-08	299-W10-052	241-T-134	A7142	43385	75908	136684.3	566755.3	6	12/10/06		4	4	12/10/06	150	150		150	45.7	10/06/44	A	MIN-MAX PERF. 50-150 FT, 1/2 sack of cement in bottom	RESOURCE PROTECTION WELL REPORT	XX	X	X		X	XX	XX	XX	XX	XXC	XX
50-00-09	299-W10-168		A7251	43514	75908	136723.7	566755.2	6		4	4	4	4	122	122	120.2	122	37.2	02/15/77	F		E-TAPED								X	X	XX	X
50-00-10	299-W10-054	241-T-132	A7144	43585	75908	136745.3	566755.2	6	6	5	5	5	12/10/06	150	150	137.6	150	45.7	10/14/44	A	MIN-MAX PERF. 50-150 FT	E-TAPED, 6,10,12" CASINGS	XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
50-00-12	299-W10-053	241-T-130	A7143	43712	75775	136784.1	566795.6	6	6	4	4	4	12/10/06	151	151	142.8	151	46.0	10/11/44	A	MIN-MAX PERF. 50-150 FT	E-TAPED, 6,10,12" CASINGS	XX	X	X		X	XX	XX	XX	XX	XXC	XX
50-01-02	299-W10-101		A7191	43671	75597	136771.7	566849.9	6	4*6	6	4	4	4*6	94	94	88.5	94	28.7	07/27/73	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-01-04	299-W10-102		A7192	43632	75595	136759.9	566850.5	6	4*6	6	4	4	4*6	87	75/123	122.9	123	37.5	08/01/73	GI	DEEPENED TO 123, 3/4/81, 4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-01-06	299-W10-103		A7193	43593	75637	136747.9	566837.7	6	4*6	6	4	4	4*6	94	94	88.4	94	28.7	08/07/73	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-01-09	299-W10-104		A7194	43685	75680	136765.0	566824.6	6	4*6	6	4	4	4*6	96	96	92.6	96	29.3	08/31/73	GI	4" CASING-GROUTED	E-TAPED/ 4&6"CASING,WELL COMPLETION REPORT, RESOURCE PROTECTION WELL REPORT						X	X	X	XXC	XXC	XXC
50-01-12	299-W10-105		A7195	43692	75637	136778.1	566837.7	6	4*6	6	4	4	4*6	92	92	92.0	92	28.0	07/31/73	GI	4" CASING-GROUTED	E-TAPED/ 4&6"CASING,WELL COMPLETION REPORT, RESOURCE PROTECTION WELL REPORT						X	X	X	XXC	XXC	XXC
50-02-02	299-W10-122		A7212	43680	75702	136774.4	566817.9	6	4*6	6	4	4	4*6	91	91	86.6	91	27.7	02/26/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-02-05	299-W10-123		A7213	43596	75723	136749.1	566811.8	6	4*6	6	4	4	4*6	93	91	86.1	91	27.7	03/06/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-02-08	299-W10-116		A7206	43627	75787	136758.2	566792.0	6	4*6	4	4	4	4*6	87	87	85.7	87	26.5	07/17/73	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-02-09	299-W10-119		A7209	43630	75780	136759.4	566794.4	6	4*6	4	4	4	4*6	91	91	88.0	91	27.7	08/02/73	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-02-10	299-W10-124		A7214	43668	75786	136770.7	566792.3	6	4*6	4	4	4	4*6	91	91	84.8	91	27.7	03/01/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-02-12	299-W10-125		A7215	43693	75744	136778.3	566805.7	6	4*6	6	4	4	4*6	92	92	87.4	92	28.0	02/25/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-03-01	299-W10-126		A7216	43693	75818	136778.3	566782.8	6	4*6	4	4	4	4*6	92	92	87.8	92	28.0	02/22/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-03-04	299-W10-118		A7208	43630	75796	136759.4	566789.3	6	4*6	4	4	4	4*6	87	87		87	26.5	07/30/73	GI	DEEPENED TO 123 4-81, 4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
														123	123	121.4	123	37.5	04/06/81			E-TAPED											
50-03-05	299-W10-117		A7207	43604	75796	136751.2	566789.3	6	4*6	4	4	4	4*6	91	91		91	27.7	08/09/73	GI	DEEPENED TO 123 3-81, 4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
														123	123	122.9	123	37.5	03/30/81														
50-03-06	299-W10-145		A7235	43603	75847	136750.8	566773.7	6	4*6	4	4	4	4*6	99	99		99	30.2	01/15/75	GI	DEEPENED 3-77	E-TAPED/ 4&6" CASING							XXC	XXC	XXC	XXC	XXC
														123	124.5	123.0	125	38.1	03/28/77														
50-03-08	299-W10-127		A7217	43634	75880	136760.6	566763.7	6	4*6	4	4	4	4*6	91	91	87.4	91	27.7	02/20/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT							X	X	XXC	XXC	XXC
50-03-10	299-W10-128		A7218	43678	75870	136773.7	566766.7	6	4*6	4	4	4	4*6	93	93	90.8	93	28.3	02/14/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT							X	X	XXC	XXC	XXC
50-04-03	299-W10-146		A7236	43552	75592	136735.5	566851.5	6	4*6	6	4	6	4*6	92	92	87.1	92	28.0	02/14/75	GI	4" CASING-GROUTED	E-TAPED, WELL COMPLETION REPORT							X	X	XXC	XXC	XXC

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WELL NUMBER				COORDINATES				WELLS/BOREHOLES														COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilied	Report	Drill	Gamma	Recon-cilied	m					HW-44355.6	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
50-04-05	299-W10-129		A7219	43500	75620	136719.6	566843.0	6	4*6	6	4	6	4*6	94	94	88.7	94	28.7	03/06/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING,WELL COMPLETION REPORT							X	X	XXC	XXC	XXC
50-04-07	299-W10-147		A7237	43501	75657	136719.9	566831.7	6	4*6	6	4	6	4*6	100	100	0.0	100	30.5	02/03/75	GI	4" CASING-GROUTED, PERFORATED 95' to 93' & 20' to 0'	4&6" CASINGS, WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-04-08	299-W10-148		A7238	43527	75685	136727.8	566823.2	6	4*6	6	4	4	4*6	100	100	96.0	100	30.5	01/22/75	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS,WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-04-10	299-W10-130		A7220	43567	75687	136740.0	566822.5	6	4*6	6	4	4	4*6	93	93	87.8	93	28.3	03/07/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS,WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-05-06	299-W10-113		A7203	43502	75742	136720.1	566805.8	6	4*6	6	4	4	4*6	87	87		87	26.5	07/20/73	GI	DEEPENED 5-77, PERFORATED 70' to 120'	4&6" CASINGS, WELL COMPLETION REPORT						X	XXC	XXC	XXC	XXC	XXC
														121	122		122	37.2	05/12/77			RESOURCE PROTECTION WELL REPORT											
50-05-07	299-W10-165		A7248	43510	75762	136722.5	566799.7	6	10*8*6	6	10	6	10/8/06	85, 120	120		91	27.7	08/08/75	A1	GROUTED	10,8,6" CASINGS,PULLED 32 FEET OF 6" CASING,RESOURCE PROTECTION WELL REPORT							X	X	X	X	X
50-05-11	299-W10-121		A7211	43592	75761	136747.5	566800.0	6	4*6	6	4	4	4*6	92	92		92	28.0	08/16/73	GI	DEEPENED TO 123 3-81, 4" CASING-GROUTED	E-TAPED, 4&6" CASINGS,WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
														123	123	122.7	123	37.5	03/24/81														
50-06-02	299-W10-108		A7198	43581	75805	136744.0	566786.6	6	4*6	4	4	4	4*6	92	92		92	28.0	07/07/73	GI	DEEPENED 5-77	E-TAPED/ 4&6" CASING						X	XXC	XXC	XXC	XXC	XXC
														125	125	122.9	125	38.1	05/19/77			PERFORATED 0 TO 20 FT, 82 TO 110 FT, 115 TO 125 FT											
50-06-03	299-W10-107		A7197	43535	75792	136733.8	566790.5	6	4*6	4	4	4	4*6	100	100		100	30.5	06/27/73	GI	DEEPENED 3-77	E-TAPED/ 4&6" CASING						X	XXC	XXC	XXC	XXC	XXC
														122	122	118.5	122	37.2	03/25/77														
50-06-04	299-W10-110		A7200	43531	75780	136728.9	566789.3	6		4	6	4	6	93	93	93.2	93	28.3	7/191973	F		E-TAPED						X	X	X	X	X	X
50-06-05	299-W10-111		A7201	43511	75809	136722.8	566786.0	6	4*6	4	4	4	4*6	94	94		94	28.7	08/23/73	GI	DEEPENED 6-77	E-TAPED/ 4&6" CASING						X	XXC	XXC	XXC	XXC	XXC
														122	122	118.8	122	37.2	06/09/77														
50-06-06	299-W10-106		A7196	43502	75837	136720.1	566776.9	6	4*6	4	4	4	4*6	100	100		100	30.5	07/03/73	GI	DEEPENED 3-77	E-TAPED/ 4&6" CASING						X	XXC	XXC	XXC	XXC	XXC
														123	123	120.3	123	37.5	03/18/77														
50-06-08	299-W10-109		A7199	43514	75870	136723.7	566766.8	6	4*6	4	6	6	4*6	92	92		92	28.0	07/10/73	GI	DEEPENED 3-77, PERFORATED 123' to 82' & 20' to 0'	RESOURCE PROTECTION WELL REPORT						X	XXC	XXC	XXC	XXC	XXC
														123	123		123	37.5	03/04/77														
50-06-11	299-W10-115		A7205	43580	75870	136743.8	566766.7	6	4*6	4	4	4	4*6	87	87	83.0	87	26.5	07/13/73	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASINGS, WELL COMPLETION REPORT, WELL PERFORATED						X	X	X	XXC	XXC	XXC
50-06-16	299-W10-167		A7250	43520	75799	136725.6	566788.4	6	10*8*6	4	6	6	10/8/06	85/126	126	86.4	94	28.7	07/10/75	A1		E-TAPED.10,8&6" CASINGS.PULLED 35 FEET OF 6" CASING AND GROUTED BOTTOM.GROUTED BETWEEN 6" AND 8" CASINGS.RESOURCE PROTECTION WELL REPORT.							X	X	X	X	X
50-06-17	299-W10-162		A7246	43504	75820	136720.7	566782.0	6	10*6	4	6	6	6-Oct	85, 122	122	86.8	91	27.7	07/10/75	F		E-TAPED, 6& 10" CASINGS,PULLED 31 FEET OF 6" CASING & GROUTED. RESOURCE PROTECTION WELL REPORT							X	X	X	X	X
50-06-18	299-W10-196		A7274	43517	75802	136724.6	566787.5		10*8*6		10	?	10/8/06			175.9	176	53.6	04/13/93	A		E-TAPED/6,8& 10"CASINGS											
50-07-03	299-W10-149		A7239	43447	75594	136703.5	566851.0	6	4*6	6	4	4	4*6	92	92	92	92	28.0	03/10/75	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-07-07	299-W10-142		A7232	43397	75657	136688.2	566831.8	6	4*6	6	6.25	4	4*6	94	94	89.8	94	28.7	03/14/74	GI	4" CASING-GROUTED, PERFORATED 91' to 89' & 20' to 0'	E-TAPED, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-07-08	299-W10-150		A7240	43427	75685	136697.3	566823.2	6	4*6	6	4	6	4*6	94	94		94	28.7	02/25/75	GI	4" CASING-GROUTED	4&6" CASING						x	X	X	XXC	XXC	XXC
50-08-05	299-W10-143		A7233	43400	75716	136688.1	566813.5	6	4*6	6	4	6	4*6	93	94	90.6	94	28.7	03/18/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-08-07	299-W10-133		A7223	43397	75761	136688.7	566800.1	6	4*6	6	4	4	4*6	94	94		94	28.7	02/28/74	GI	DEEPENED TO 120 FT 3-81, 4" CASING-GROUTED	E-TAPED, WELL COMPLETION REPORT						X	X	X	X	XXC	XXC
														120	120	119.5	120	36.6	03/12/81	GI													
50-08-08	299-W10-176		A7255	43432	75777	136698.6	566795.1	6	6	6	6	6	6	100	103	97.4	103	31.4	04/25/78	F	GROUTED	E-TAPED, GROUTED T&B,WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
50-08-09	299-W10-112		A7202	43452	75787	136704.9	566792.4	6	4*6	6	4	4	4*6	87	87		87	26.5	07/15/73	GI	DEEPENED 4-77	E-TAPED, 4&6" CASING, GROUTED T&B, WELL COMPLETION REPORT						X	XXC	XXC	XXC	XXC	XXC
														121	121	119.2	121	36.9	04/01/77	GI													

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WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
50-08-11	299-W10-051	241-T-133, 241-T-131	A7141	43485	75776	136714.9	566795.5		6		4	4	6	148	150	135.8	150	45.7	10/05/44	F		E-TAPED	XX	X	X		X	XX	XX	XX	XX	XX	XX
50-08-19	299-W10-178		A7257	43408	75759	136691.5	566800.7	6	8*6	4	6	4	6	95	95	86.4	95	29.0	08/02/79	F	GROUTED	E-TAPED,GROUTED T&B,WELL COMPLETION REPORT,RESOURCE PROTECTION WELL REPORT									X	XXC	XXC
50-09-01	299-W10-164		A7247	43493	75785	136717.3	566792.7	6	6	6	6	6	6	150	150	86.5	150	45.7	09/30/75	F	GROUTED	E-TAPED							X	X	X	X	X
50-09-02	299-W10-166		A7249	43461	75789	136707.6	566791.5	6	8*6	6	6	6	8*6	122	122	86.3	122	37.2	06/30/75	F	GROUTED/PERFORATED	E-TAPED 6&8" CASING,122 FT OF 6" CASING							X	X	X	X	X
50-09-05	299-W10-134		A7224	43397	75812	136688.1	566784.6	6	4*6	6	4	6	4*6	94	94		94	28.7	03/13/74	GI	4" CASING-GROUTED, PERFORATED	4&6" CASING, GROUTED TOP,WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-09-07	299-W10-144		A7234	43397	75857	136688.0	566770.8	6	4*6	6	6	6	4*6	94	94	90.7	94	28.7	03/15/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-09-09	299-W10-120		A7210	43447	75882	136703.3	566763.2	6	4*6	6	6	6	4*6	121	121	118.3	121	36.9	05/05/77	GI	DEEPENED 4-77	E-TAPED/ 4&6" CASING						X	XXC	XXC	XXC	XXC	XXC
50-09-10	299-W10-114		A7204	43480	75870	136713.3	566766.8	6	4*6	6	6	6	4*6	121	121	119.9	121	36.9	07/25/73	GI	DEEPENED 4/12/77	E-TAPED/ 4&6" CASING						X	XXC	XXC	XXC	XXC	XXC
50-10-05	299-W10-135		A7225	43305	75617	136660.2	566844.1	6	4*6	6	0	6	4*6	95	95		95	29.0	02/19/74	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-10-07	299-W10-136		A7226	43306	75657	136660.2	566831.9	6	4*6	6	0	6	4*6	94	94		94	28.7	02/14/74	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-10-08	299-W10-151		A7241	43327	75684	136666.8	566823.6	6	4*6	6	4	6	4*6	93	93		93	28.3	03/04/75	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-10-10	299-W10-137		A7227	43367	75684	136679.0	566823.6	6	4*6	6	6.25	6	4*6	94	94		94	28.7	02/21/74	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-11-05	299-W10-138		A7228	43305	75717	136660.1	566813.6	6	4*6	6	4	6	4*6	93	93		93	28.3	02/12/74	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-11-07	299-W10-152		A7242	43305	75757	136660.1	566801.4	6	4*6	6	4	6	4*6	94	94		94	28.7	02/27/75	GI	4" CASING-GROUTED	4&6" CASING, WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-11-08	299-W10-139		A7229	43327	75787	136666.8	566792.2	6	4*6	6	4	6	4*6	94	94	93.2	94	28.7	02/25/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-11-10	299-W10-153		A7243	43369	75789	136679.6	566791.6	6	4*6	6	4	6	4*6	100	100	97.5	100	30.5	01/08/75	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING, WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-11-11	299-W10-177		A7256	43387	75759	136685.1	566800.7	6	8*6	6	6	4	8*6	95	92	85.6	92	28.0	07/26/79	F	GROUTED	E-TAPED, 6&8" CASING, RESOURCE PROTECTION WELL REPORT									XXC	XXC	XXC
50-12-05	299-W10-154		A7244	43305	75817	136660.0	566783.1	6	4*6	6	6	4	4*6	100	100	98.3	100	30.5	01/02/75	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING, WELL COMPLETION REPORT						x	X	X	XXC	XXC	XXC
50-12-07	299-W10-140		A7230	43305	75855	136660.0	566771.5	6	4*6	6	6	4	4*6	94	94	91.8	94	28.7	03/05/74	GI	4" CASING-GROUTED	E-TAPED, 4&6" CASING, WELL COMPLETION REPORT						X	X	X	XXC	XXC	XXC
50-12-10	299-W10-141		A7231	43360	75880	136676.7	566763.9	6	4*6	6	6	4	4*6	94	94		94	28.7	03/01/74	GI	DEEPENED 2-77	E-TAPED, 4&6" CASING,						X	XXC	XXC	XXC	XXC	XXC
														121	121	119.6	121	36.9	02/17/77														
	299-W10-131		A7221	NA	NA								NA				NA		NA	NA	NOT DRILLED PER DRAWING H-2-236942, REV.11							x	x	x	x	X	X
	299-W10-132		A7222	NA	NA								NA				NA		NA	NA	NOT DRILLED PER DRAWING H-2-236942, REV.11							x	x	x	x	X	X
216-T-32	299-W10-056	224-T-1	A7146	43434	76023	136699.2	566720.2	8	8		8	8	8	150	150		150	45.7	06/17/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-32	299-W10-057	224-T-2	A7147	43449	75994	136703.8	566729.1	8	8		8	8	8	150	148		148	45.1	06/16/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-32	299-W10-058	224-T-3	A7148	43418	75994	136694.3	566729.1	8	8		8	8	8	150	150		150	45.7	07/03/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-059	221-T-2, 241-T-2	A7149	43298	76012	136657.8	566723.7	8	8		8	8	8	150	150		150	45.7	07/21/47	D	MIN-MAX PERFORATED DEPTH (FT),33-38	RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
216-T-7	299-W10-060	221-T-3, 241-T-3	A7150	43298	75998	136657.8	566728.0	8	8		8	8	8	150	150		150	45.7	07/22/47	D	MIN-MAX PERFORATED DEPTH (FT),31-36	RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
216-T-7	299-W10-061	221-T-5, 241-T-5	A7151	43272	76012	136649.8	566723.7	8	8		8	8	8	150	150		150	45.7	07/22/47	D	MIN-MAX PERFORATED DEPTH (FT),32-37	RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
216-T-7	299-W10-062	221-T-6, 241-T-6	A7152	43305	76020	136659.9	566721.2	8	8		8	8	8	150	150		150	45.7	07/30/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-063	221-T-8, 241-T-8	A7153	43265	75980	136647.7	566733.5	8	8		8	8	8	150	150		150	45.7	07/17/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-32	299-W10-064	224-T-5	A7154	43410	75991	136691.9	566730.0	8	8		8	8	8	75	75		75	22.9	07/11/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-32	299-W10-065	224-T-6	A7155	43392	75980	136686.4	566733.4	8			8	8	8	75	75		75	22.9	08/13/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-066	221-T-4, 241-T-4	A7156	43272	75988	136649.8	566731.0	8	8		8	8	8	125	125		125	38.1	07/15/47	D	MIN-MAX PERFORATED DEPTH (FT),31-36	RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
216-T-7	299-W10-067	221-T-7, 241-T-7	A7157	43305	75980	136659.9	566733.4	8	8		8	8	8	150	150		150	45.7	08/01/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-068	221-T-9, 241-T-9	A7158	43265	76020	136647.7	566721.3	8	8		8	8	8	150	150		150	45.7	07/30/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

241 - T - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m					HW-44355.0	HW-44355.1	HW-44355.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
216-T-7	299-W10-069	221-T-10 241-T-10	A7159	43320	76110	136664.4	566693.8	8	8		8	8	8	150	150		150	45.7	08/01/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-073	221-T-14, 241-T-14	A7163	43364	76082	136677.8	566702.3	8	8		8	8	8	75	75		75	22.9	09/22/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-074	221-T-1, 241-T-1	A7164	43285	76000	136653.8	566727.4	8	8		8	8	8	49	49		49	14.9	10/14/47	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-32	299-W10-075	224-T-7	A7165	43431	75980	136698.3	566733.3	8			8	8	8	75	75		75	22.9	10/08/47	F1			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-32	299-W10-076	224-T-8	A7166	43405	76120	136690.3	566690.7	8	8		8	8	8	75	75		75	22.9	10/24/47	F1	BURIED, TOP OF CASING FLUSH AT GRADE (1/9/92)	RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XXC	XXC	XXC	XX	XX
216-T-7	299-W10-077	224-TSW-1	A7167	43315	76111	136662.9	566693.5	8	8		8	8	8	23			23	7.0	12/01/48	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
216-T-7	299-W10-080	224-T-9	A7170	43220	76078	136633.92	566703.63	8			8	8	8	115	115		115	35.1	09/27/51	F1	MIN-MAX PERFORATED DEPTH (FT),77-83	BACKFILLED BOREHOLE FROM 115 TO 109 FEET, CEMENTED FROM 109 FEET TO 106 FEET	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC
216-T-7	299-W10-081	224-TSW-2, 241-TSW-2	A7171	43270	76096	136649.2	566698.1	8	8		8	8	8	23			23	7.0	11/01/51	F1		RESOURCE PROTECTION WELL REPORT	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

241 - TX - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m	Installed				HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
51-00-03	299-W15-067	241-TX-6	A7368	41803	75690	136202.4	566823.0	8	8	6	8	6	8	150	150	150.3	150	45.7	01/27/49	D	MIN-MAX PERF. 38-98 FT	RESOURCE PROTECTION WELL REPORT	XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-00-05	299-W15-070	241-TX-3	A7371	41590	75700	136137.5	566820.1	8		6	8	N/F	8	150	150		150	45.7	01/31/49	D	MIN-MAX PERF. 40-100 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-00-06	299-W15-069	241-TX-2	A7370	41590	75903	136137.3	566758.2	8	12*10	8	8	8	8	150	150	143	150	45.7	02/09/49	D	MIN-MAX PERF. 40-100 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-00-07	299-W15-073	241-TX-1	A7374	41590	76106	136137.1	566696.3	8		8	8	8	8	150	150		150	45.7	03/04/49	D	MIN-MAX PERF. 40-100 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-00-09	299-W15-074	241-TX-5	A7375	41803	76126	136202.0	566690.1	8		8	8	8	8	150	150		150	45.7	03/03/49	D	MIN-MAX PERF. 40-100 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-00-10	299-W15-075	241-TX-8	A7376	42007	76056	136264.3	566711.3	8	8	8	8	8	8	150	150		150	45.7	03/04/49	D	MIN-MAX PERF. 40-100 FT	RESOURCE PROTECTION WELL REPORT	XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-01-02	299-W15-166		A7464	41680	75710	136164.9	566817.0	6		6	6	6	6	112	112	108.2	112	34.1	01/22/74	F		E-TAPED						x	X	X	X	XX	X
51-01-04	299-W15-167		A7465	41630	75708	136149.6	566817.6	6		6	6	6	6	115	115		115	35.1	12/21/73	F								x	X	X	X	XX	X
51-01-06	299-W15-168		A7466	41603	75750	136141.4	566804.8	6		6	6	6	6	100	100		100	30.5	04/19/74	F								x	X	X	X	XX	X
51-01-08	299-W15-169		A7467	41615	75780	136145.0	566795.7	6		6	6	6	6	100	100		100	30.5	04/18/74	F								x	X	X	X	XX	X
51-01-09	299-W15-155		A7453	41655	75800	136157.2	566789.6	6		6	6	N/F	6	115	48+	112	115	35.1	12/18/73	F								x	X	X	X	XX	X
51-02-02	299-W15-170		A7468	41688	75820	136167.2	566783.4	6		6	6	6	6	100	100		100	30.5	04/23/74	F								x	X	X	X	XX	X
51-02-05	299-W15-143		A7442	41617	75819	136145.6	566783.8	6		6	6	6	6	100	100		100	30.5	07/21/71	F							x	x	X	X	X	XX	X
51-02-07	299-W15-172		A7470	41603	75863	136141.3	566770.4	6		6	6	6	6	100	100		100	30.5	04/16/74	F								x	X	X	X	XX	X
51-02-09	299-W15-142		A7441	41646	75896	136154.4	566760.3	6		6	6	6	6	100	100		100	30.5	07/08/71	F							x	x	X	X	X	XX	X
51-02-12	299-W15-141		A7440	41696	75852	136169.6	566773.7	6		6	6	6	6	100	100		100	30.5	07/16/71	F							x	x	X	X	X	XX	X
51-03-01	299-W15-192		A4923	41692	75945	136168.4	566745.3	6			6	6	6	105		100	105	32.0	06/01/77	F	GROUTED	WELL COMPLETION REPORT/ GROUTED T&B								XXC	XXC	XXC	XXC
51-03-02	299-W15-071	241-TX-4	A7372	41690	75903	136167.8	566758.1	8		8	8	8	8	150	150		150	45.7	02/08/49	D	MIN-MAX PERF. 60-100 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-03-06	299-W15-127		A7426	41602	75954	136140.9	566742.7	6		6	6.125	6	6	100	100		100	30.5	11/10/71	F							x	X	X	X	X	XX	X
51-03-09	299-W15-128		A7427	41654	76002	136156.7	566728.0	6		6	6	6	6	100	100	98.1	100	30.5	11/08/71	F		E-TAPED					x	X	X	X	X	XX	X
51-03-11	299-W15-191		A7489	41692	75965	136168.3	566739.2	6	6*8	6	6	6	6*8	105	105	100.0	105	32.0	05/27/71	F	GROUTED	GROUTED T&B/ 6&8" CASING,8" PULLED,WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
51-03-12	299-W15-126		A7425	41698	75954	136170.2	566742.6	6		6	6	6	6	100	100		100	30.5	11/02/71	F							x	X	X	X	X	XX	X
51-04-02	299-W15-153		A7451	41682	76022	136165.2	566721.9	6	6*8	6	6	6	6	105	105	96.3	105	32.0	04/05/76	F		E-TAPED, GROUTED							X	X	X	XX	X
51-04-05	299-W15-130		A7429	41616	76022	136145.1	566721.9	6		6	6	6	6	100	100	99.1	100	30.5	11/12/71	F		E-TAPED					x	X	X	X	X	XX	X
51-04-06	299-W15-154		A7452	41608	76058	136142.7	566711.0	6	6*8	6	6	6	6*8	105	105		105	32.0	04/05/76	F		6&8" CASING, ANNULUS BETWEEN CASINGS GROUTED							X	X	X	XX	X
51-04-08	299-W15-131		A7430	41626	76096	136148.1	566699.4	6		6	6	6	6	100	100	100.1	100	30.5	11/12/71	F		E-TAPED					x	X	X	X	X	XX	X
51-04-10	299-W15-156		A7454	41682	76092	136165.2	566700.5	6	6*8	6	6	6	6*8	105	105	96.4	105	32.0	04/13/76	F		E-TAPED,6&8" CASING, ANNULUS BETWEEN CASINGS GROUTED						x	X	X	X	XX	X
51-04-12	299-W15-129		A7428	41698	76056	136170.1	566711.5	6		6	6	4	6	100	100	100.7	100	30.5	11/23/71	F		E-TAPED					x	X	X	X	X	XX	X
51-05-01	299-W15-173		A7471	41787	75724	136197.5	566812.6	6		6	6	6	6	100	100	99.5	100	30.5	03/29/74	F		E-TAPED/ WELL INSIDE PLASTIC VALVE BOX						x	X	X	X	XX	X
51-05-03	299-W15-174		A7472	41757	75702	136188.3	566819.3	6		6	6	6	6	115	115.0	113.7	115	35.1	01/28/74	F		E-TAPED						x	X	X	X	XX	X
51-05-05	299-W15-145		A7444	41719	75717	136176.8	566814.8	6		6	6	6	6	100	100.5	99.5	100	30.5	06/14/71	F		E-TAPED					x	x	X	X	X	XX	X
51-05-07	299-W15-171		A7469	41708	75763	136173.4	566800.8	6	6	6	6	6	6	111	111.0	107.1	111	33.8	01/17/74	F		E-TAPED/ WELL INSIDE PLASTIC VALVE BOX						x	X	X	X	XX	X
51-05-08	299-W15-146		A7445	41729	75790	136179.7	566792.5	6		6	6	6	6	100	100.0	99.6	100	30.5	06/17/71	F		E-TAPED					x	x	X	X	X	XX	X
51-05-10	299-W15-144		A7443	41785	75783	136196.8	566794.6	6		6	6	6	6	100	100.0	100.2	100	30.5	06/23/71	F							x	x	X	X	X	XX	X
51-06-02	299-W15-148		A7447	41785	75819	136196.8	566783.7	6		6	6	6	6	100	100.0		100	30.5	06/25/71	F							x	x	X	X	X	XX	X
51-06-04	299-W15-149		A7448	41726	75814	136178.8	566785.2	6		6	6	6	6	100	100.5		100	30.5	07/14/71	F							x	x	X	X	X	XX	X
51-06-08	299-W15-175		A7473	41730	75892	136180.0	566761.5	6		6	6	6	6	100	100.0		100	30.5	04/11/74	F								x	X	X	X	XX	X
51-06-10	299-W15-147		A7446	41785	75885	136196.7	566763.5	6		6	6.125	6	6	100	100.0		100	30.5	07/01/71	F							x	x	X	X	X	XX	X
51-06-12	299-W15-158		A7456	41804	75850	136202.6	566774.2	6	6*8	6	6	6	6*8	105	105.0	105.0	100	30.5	04/01/76	F		6&8" CASINGS (6" WELL),8" CASING PULLED,6" CASING GROUTED T&B						x	X	X	X	XX	X
51-07-01	299-W15-178		A7476	41799	75932	136201.0	566749.2	6		6	6	6	6	110	110.0		110	33.5	01/23/74	F								x	X	X	X	XX	X
51-07-03	299-W15-187		A7484	41768	75903	136191.5	566758.1	6		6	6	6	6	100	105.0		105	32.0	05/29/76	F									x	x	X	XX	X
51-07-04	299-W15-133		A7432	41721	75917	136177.2	566753.8	6		6	6	6	6	100	100.0		100	30.5	12/01/71	F							x	X	X	X	X	XX	X
51-07-06	299-W15-193		A7491	41708	75954	136173.2	566742.6	6		6	6	N/F	6	55	55.0	50.0	55	16.8	07/01/77	F	GROUTED	WELL COMPLETION REPORT/ PERFORATED 50-25 FT								XXC	XXC	XXC	XXC
51-07-07	299-W15-190		A7488	41714	75975	136175.0	566736.2	6		6	6	6	6	105	105.0	105.0	105	32.0	05/16/77	F	GROUTED	WELL COMPLETION REPORT/ GROUTED T&B								XXC	XXC	XXC	XXC
51-07-09	299-W15-134		A7433	41748	76001	136185.4	566728.2	6		6	6	6	6	100	100.0	100.0	100	30.5	11/18/71	F							x	X	X	X	X	XX	X
51-07-11	299-W15-132		A7431	41794	75978	136199.4	566735.2	6		6	6	6	6	100	100.0	100.0	100	30.5	11/29/71	F							x	X	X	X	X	XX	X
51-07-18	299-W15-195		A7493	41708	75956	136173.2	566742.0	6		6	6	6	6	105	105.0	105.0	105	32.0	07/01/77	F	GROUTED	WELL COMPLETION REPORT/ GROUTED T&B								XXC	XXC	XXC	XXC
51-08-05	299-W15-136		A7435	41718	76022	136176.2	566721.8	6		6	6	6	6	100	101.1	100.0	101	30.8	11/16/71	F							x	X	X	X	X	XX	X
51-08-09	299-W15-137		A7436	41748	76104	136185.3	566696.8	6		6	6	6	6	100	100.0	100.0	100	30.5	11/16/71	F							x	X	X	X	X	XX	X
51-08-11	299-W15-135		A7434	41794	76080	136199.3	566704.1	6		6	6	6	6	100	100.0	100.0	100	30.5	11/18/71	F							x	X	X	X	X	XX	X
51-09-03	299-W15-139		A7438	41870	75705	136222.8	566818.3	6		6	6	6	6	100	100.0	100.0	100	30.5	10/27/71	F							x	X	X	X	X	XX	X
51-09-04	299-W15-188		A7485	41830	75714	136210.6	566815.6	6			6	6	6	105	105.0	99.0	105	32.0	04/13/76	F		E-TAPED							X	X	X	XX	X
51-09-08	299-W15-140		A7439	41820	75784	136207.5	566794.3	6		6	6	6	6	100	100.0	100.0	100	30.5	10/22/71	F							x	X	X	X	X	XX	X
51-09-10	299-W15-189		A7486	41871	75793	136223.0	566791.5	6		6	6	6	6	105	105.0	98.0	105	32.0	04/01/76	F									X	X	X	XX	X
51-09-12	299-W15-138		A7437	41902	75750	136232.5	566804.6	6		6	6	6	6	100	85.0		85	25.9	10/18/71	F							x	X	X	X	X	XX	X

241 - TX - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilied	Report	Drill	Gamma	Recon-cilied	m	Installed				HW-44355,0	HW-44355,1	HW-44255,2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
51-10-01	299-W15-176		A7474	41889	75819	136228.5	566783.6	6		6	6	6	6	100	100.0		100	30.5	04/10/74	F								x	X	X	X	XX	X
51-10-04	299-W15-103		A7402	41844	75810	136214.8	566786.4	6		6	6.25	6	6	100	100.0	100.0	100	30.5	09/15/70	F								x	X	X	X	XX	X
51-10-08	299-W15-104		A7403	41820	75886	136207.4	566763.2	6		6	6	6	6	100	100.0	100.0	100	30.5	09/24/70	F								x	X	X	X	XX	X
51-10-12	299-W15-105		A7404	41898	75863	136231.2	566770.2	6		6	6	6	6	100	100.0	100.0	100	30.5	09/01/70	F								x	X	X	X	XX	X
51-10-13	299-W15-196		A7494	41899	75817	136231.5	566784.2	6		6	6	6	6	105	105.0	102.0	105	32.0	09/22/77	F	GROUTED	WELL COMPLETION REPORT/ GROUTED T&B								XXC	XXC	XXC	XXC
51-10-25	299-W15-197		A7495	41895	75831	136230.3	566779.9	6		6	6	6	6	100	108.0	102.0	108	32.9	03/28/78	F	GROUTED	WELL COMPLETION REPORT/ GROUTED T&B								XXC	XXC	XXC	XXC
51-11-01	299-W15-177		A7475	41898	75934	136231.1	566748.5	6		6	6	6	6	113	113.0	113.0	113	34.4	04/24/74	F								x	X	X	X	XX	X
51-11-02	299-W15-072	241-TX-7	A7373	41894	75903	136229.9	566758.0	6		6	8	6	8	150	150.0	150.0	150	45.7	02/08/49	C1	MIN-MAX PERF. 40-95 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-11-03	299-W15-106		A7405	41866	75908	136221.4	566756.5	6		6	6	6	6	100	100.0	100.0	100	30.5	10/02/70	F								x	X	X	X	XX	X
51-11-07	299-W15-107		A7406	41813	75978	136205.2	566735.2	6		6	6	6	6	100	100.0	100.0	100	30.5	09/25/70	F								x	X	X	X	XX	X
51-11-10	299-W15-108		A7407	41889	75989	136228.4	566731.8	6		6	6	6	6	100	100.0	100.0	100	30.5	10/02/70	F								x	X	X	X	XX	X
51-12-01	299-W15-159		A7457	41900	76030	136231.7	566719.3	6		6	6	6	6	100	100.0	100.0	100	30.5	11/20/73	F								x	X	X	X	XX	X
51-12-04	299-W15-109		A7408	41842	76010	136214.0	566725.4	6		6	6	6	6	100	100.0	100.0	100	30.5	09/22/70	F								x	X	X	X	XX	X
51-12-05	299-W15-179		A7477	41800	76036	136201.2	566717.5	6		6	6	6	6	100	100.0	100.2	100	30.5	04/26/74	F		E-TAPED						x	X	X	X	XX	X
51-12-07	299-W15-110		A7409	41813	76080	136205.1	566704.1	6		6	6	6	6	100	100.0	99.1	100	30.5	10/02/70	F		E-TAPED						x	X	X	X	XX	X
51-12-10	299-W15-180		A7478	41868	76098	136221.9	566698.6	6		6	6	6	6	100	100.0	99.7	100	30.5	04/30/74	F		E-TAPED						x	X	X	X	XX	X
51-12-11	299-W15-111		A7410	41900	76080	136231.6	566704.0	6		6	6.25	6	6	100	100.0	100.0	100	30.5	09/25/70	F								x	X	X	X	XX	X
51-13-05	299-W15-112		A7411	41922	75716	136238.6	566814.9	6		6	6	6	6	100	100.0	100.0	100	30.5	10/13/70	F								x	X	X	X	XX	X
51-13-08	299-W15-113		A7412	41925	75781	136239.5	566795.1	6		6	6	6	6	100	100.0	100.0	100	30.5	09/16/70	F								x	X	X	X	XX	X
51-13-12	299-W15-114		A7413	42004	75750	136263.6	566804.5	6		6	6	6	6	100	100.0	100.0	100	30.5	10/09/70	F								x	X	X	X	XX	X
51-14-04	299-W15-115		A7414	41950	75809	136247.1	566786.6	6		6	6	6	6	100	100.0	100.0	100	30.5	09/14/70	F								x	X	X	X	XX	X
51-14-08	299-W15-116		A7415	41922	75886	136238.5	566763.1	6		6	6	6	6	100	100.0	100.0	100	30.5	09/22/70	F								x	X	X	X	XX	X
51-14-11	299-W15-117		A7416	41999	75863	136262.0	566770.1	6		6	6	6	6	100	100.0	100.0	100	30.5	09/17/70	F								x	X	X	X	XX	X
51-15-04	299-W15-118		A7417	41947	75907	136246.1	566756.7	6		6	6	6	6	100	100.0	100.0	100	30.5	03/09/70	F								x	X	X	X	XX	X
51-15-07	299-W15-119		A7418	41922	75982	136238.4	566733.9	6		6	6	6	6	100	95.0	95.0	95	29.0	03/03/70	F								x	X	X	X	XX	X
51-15-09	299-W15-160		A7458	41960	75999	136250.0	566728.7	6		6	6	6	6	100	100.0	100.0	100	30.5	12/04/73	F								x	X	X	X	XX	X
51-15-11	299-W15-120		A7419	41998	75969	136261.6	566737.8	6		6	6	6	6	100	100.0	100.0	100	30.5	03/11/70	F								x	X	X	X	XX	X
51-16-04	299-W15-161		A7459	42048	75704	136277.0	566818.5	6		6	6	6	6	100	100.0	100.0	100	30.5	11/29/73	F								x	X	X	X	XX	X
51-16-07	299-W15-163		A7461	42021	75788	136268.7	566792.9	6		6	6	6	6	100	100.0	100.0	100	30.5	12/04/73	F								x	X	X	X	XX	X
51-16-11	299-W15-162		A7460	42106	75765	136294.7	566799.9	6		6	6	6	6	100	100.0	100.0	100	30.5	11/21/73	F								x	X	X	X	XX	X
51-17-02	299-W15-121		A7420	42094	75818	136291.0	566783.7	6			6.125	6	6	100	100.0	100.0	100	30.5	10/15/70	F						x	X	X	X	X	X	XX	X
51-17-03	299-W15-068	241-TX-9	A7369	42098	75801	136292.2	566788.9	6		6	8	8	8	150	150.0	150.0	150	45.7	01/28/49	F1	MIN-MAX PERF. 38-92 FT		XX	X	X	X	X	XX	XX	XX	XX	XXC	XX
51-17-10	299-W15-122		A7421	42082	75894	136287.2	566760.6	6		8	6.125	6	6	100	100.0	100.0	100	30.5	10/07/70	F						x	X	X	X	X	X	XX	X
51-17-11	299-W15-164		A7462	42106	75856	136294.6	566772.1	6	6	6	6.125	6	6	100	100.0	100.0	100	30.5	10/30/73	F		RESOURCE PROTECTION WELL REPORT						x	X	X	X	XX	X
51-18-01	299-W15-181		A7479	42103	75934	136293.6	566748.4	6		6	6	6	6	100	100.0	100.4	100	30.5	04/29/74	F								x	X	X	X	XX	X
51-18-03	299-W15-123		A7422	42070	75908	136283.6	566756.3	6		6	6	6	6	100	100.0	100.0	100	30.5	10/20/70	F						x	X	X	X	X	X	XX	X
51-18-05	299-W15-182		A7480	42024	75922	136269.6	566752.1	6		6	6	6	6	100	100.0	100.0	100	30.5	04/30/74	F								x	X	X	X	XX	X
51-18-07	299-W15-124		A7423	42020	75976	136268.3	566735.6	6		6	6	6	6	100	100.0	100.0	100	30.5	09/08/70	F						x	X	X	X	X	X	XX	X
51-18-09	299-W15-183		A7481	42054	76001	136278.6	566728.0	6		6	6	6	6	100	100.0	99.8	100	30.5	04/08/74	F		E-TAPED						x	X	X	X	XX	X
51-18-10	299-W15-125		A7424	42093	75989	136290.5	566731.6	6		6	5	5	5	100	100.0	99.5	100	30.5	11/02/70	F		E-TAPED						x	X	X	X	XX	X
51-18-11	299-W15-165		A7463	42106	75960	136294.5	566740.4	6	6	6	6	6	6	100	100.0	100.0	100	30.5	11/16/73	F		RESOURCE PROTECTION WELL REPORT						x	X	X	X	XX	X
NA	299-W15-151		A7450								0	0		25	25.0		25	7.6	02/06/73	1		CLEANED HOLE, SAMPLED,PULLED CASING											x
NA	299-W15-194		A7492	41709	75958	136173.5	566741.4	6	6*8		6	6	6*8	48	48.0		48	14.6	07/07/77	F	GROUTED	6&8" CASING, GROUTED T&B,WELL COMPLETION REPORT, PULLED 8" CASING PERFORATED 48 FEET TO 25 FEET, HIT TANK FOOTING								XXC	XXC	XXC	XXC

241 - TY - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilled	Report	Drill	Gamma	Recon-cilled	m	Installed				HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
52-01-01	299-W10-088		A7178	42649	75836	136460.1	566777.8	6	6	6		6	6	100	100		100	30.5	12/10/71	F		RESOURCE PROTECTION WELL REPORT					X	X	X	X	X	XX	X
52-01-05	299-W10-089		A7179	42570	75318	136436.4	566935.7	6		6	6	6	6	100	100	100.0	100	30.5	12/08/71	F		E-TAPED					X	X	X	X	X	XX	X
52-01-09	299-W10-090		A7180	42600	75900	136445.1	566758.4	6		6	6	6	6	100	100	99.1	100	30.5	12/17/71	F		E-TAPED					X	X	X	X	X	XX	X
52-02-01	299-W10-091		A7181	42649	75938	136460.0	566746.7	6		6	6	6	6	100	100	100.0	100	30.5	11/23/71	F		E-TAPED					X	X	X	X	X	XX	X
52-02-05	299-W10-092		A7182	42570	75920	136436.0	566752.3	6		6	6	6	6	100	100	99.0	100	30.5	12/17/71	F		E-TAPED					X	X	X	X	X	XX	X
52-02-06	299-W10-171		A7254	42552	75956	136430.4	566741.3	6			6	6	6	100		100.1	100	30.5	08/31/47	F		E-TAPED											
52-02-09	299-W10-093		A7183	42600	76002	136445.0	566727.3	6		6	6	6	6	100	100	99.0	100	30.5	12/14/71	F		E-TAPED					X	X	X	X	X	XX	X
52-02-11	299-W10-161		A7245	42638	75980	136456.6	566733.9	4		4	6	6	6	100	100	95.6	100	30.5	5/15/75,7/9/77	F	GROUTED	4&6" CASING ADDED W/PLUG/ E-TAPED							X	X	XXC	XXC	XXC
52-03-03	299-W10-095		A7185	42498	75804	136414.1	566787.7	6		6	6	6	6	100	100		100	30.5	12/01/71	F							X	X	X	X	X	XX	X
52-03-06	299-W10-096		A7186	42452	75852	136400.0	566773.1	6	6	6	6	6	6	100	100	100.2	100	30.5	12/06/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					X	X	X	X	X	XX	X
52-03-12	299-W10-094		A7184	42550	75852	136429.9	566773.0	6		6	6	6	6	100	100	99.9	100	30.5	11/29/71	F		E-TAPED					X	X	X	X	X	XX	X
																				F													
52-04-02	299-W10-097		A7187	42536	75920	136425.6	566752.3	6	6	6	6	6	6	100	100	98.6	100	30.5	12/14/71	F		E-TAPED, RESOURCE PROTECTION WELL REPORT					X	X	X	X	X	XX	X
52-04-03	299-W10-083	241-TY-4	A7173	42544	75912	136428.0	566754.7	6		6	6	6	6	150	150	146.9	150	45.7	06/19/52	D	MIN-MAX PERF. 40-100 FT	E-TAPED/PERFORATED 40 FT DOWN TO 100 FT, 5 HOLES/FT. 6" DIA WELL	XX	X	X	X	X	X	XX	XX	XX	XXC	XX
52-04-06	299-W10-098		A7188	42452	75954	136400.0	566742.0	6		6	6	6	6	100	100	98.6	100	30.5	12/07/71	F		E-TAPED					X	X	X	X	X	XX	X
52-04-09	299-W10-099		A7189	42506	76002	136416.4	566727.3	6		6	6	6	6	100	100	99.2	100	30.5	12/10/71	E	PERFORATED 3 SLITS @52 FEET, 3@76 FEET, 3@ 87 FEET AND 4 SLITS@89 FEET	E-TAPED					X	X	X	X	X	XX	X
52-04-10	299-W10-082	241-TY-3	A7172	42549	75997	136429.5	566728.8	6		6	6	6	6	150	150	142.9	150	45.7	08/15/52	D	MIN-MAX PERF. 40-100 FT	E-TAPED	XX	X	X	X	X	X	X	XX	XX	XXC	XX
52-05-07	299-W15-186		A7484	42357	75872	136371.1	566767.1				6	6	6	100	100	97.5	100	30.5	08/08/74	F		E-TAPED							X	X	X	XX	X
52-06-02	299-W10-100		A7190	42443	75928	136397.2	566749.9	6		6	6	6	6	66		65.9	66	20.1	NA	F		E-TAPED, RESOURCE PROTECTION WELL REPORT							X	X	X	XX	X
52-06-04	299-W15-185		A7483	42385	75910	136379.6	566755.5	6		6	6	6	6	100	100	98.3	100	30.5	08/12/74	F		E-TAPED							X	X	X	XX	X
52-06-05	299-W15-079	241-TY-1	A7380	42358	75912	136371.3	566754.9	6,8	8	6	8	6	8	150	150	148.0	150	45.7	09/25/52	D	MIN-MAX PERF. 40-100 FT	E-TAPED/PERFORATED 40 FT DOWN TO 100 FT	XX	X	X	X	XX	XX	XX	XX	XX	XXC	XX
52-06-06	299-W15-184		A7482	42357	75938	136371.0	566747.0	6		6	6	6	6	100	100	100.4	100	30.5	08/14/74	F		E-TAPED							X	X	X	XX	X
52-06-07	299-W15-003	241-TY-2 EMA-2894/ IBM-2894	A4928	42359	75996	136371.6	566729.3	8	4*6*8	4	8	8	6*8	245	245	237.0	236	71.9	09/10/73	B1	MIN-MAX PERFORATED DEPTH(FT), 200-245 4", 0-192 /PERF 0-209,GROUTED 0-187, Gravel Backfill to 241 ft.	E-TAPEDPERFORATED 40 FT DOWN TO 100 FT, 6&8" CASING, WELL CONSTR. ASBUILT, CEMENT PLUG 241 FEET TO 236 FT	XX	XX	XXC	XXC	XXC	XXC	XXCC	XXCC	XXCC	XXCC	XXCC
NA	299-W15-013		A4918	42350	76095	136368.8	566699.1	6	6				6	225	225		225	68.6	09/05/73	B1	MIN-MAX PERF. 197-225 FT	WELL CONSTR. SUMMARY,RESOURCE PROTECTION WELL REPORT. EXTENDS 2.9 FEET ABOVE GROUND SURFACE						XXC	XXC	XXC	XXC	XXC	XXC
NA	299-W15-096		A7395	42446	75933	136398.2	566748.4		6				6	72			72		01/01/61	I	6" CASING IS AT GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONED PER AGREEMENT W/ WA. DEPT OF ECOLOGY. REFER TO DOCUMENT NO. RFSNW-9050916,DATED 1/31/97											
NA	299-W15-097		A7396	42356	75935	136370.7	566747.9		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											
NA	299-W15-098		A7397	42390	75906	136381.1	566756.7		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											
NA	299-W15-099		A7398	42365	75918	136373.5	566753.1		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											

241 - TY - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilled	Report	Drill	Gamma	Recon-cilled	m	Installed				HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
NA	299-W15-100		A7399	42380	75908	136378.1	566756.1		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											
NA	299-W15-759		B2759	42353	75941	136369.8	566746.1		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											
NA	299-W15-760		B2760	42360	75927	136372.0	566750.3		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											
NA	299-W15-761		B2761	42372	75911	136375.6	566755.2		2				2	70			70		01/01/61	I	CASING 2" SCH 80,PROTUDES ABOUT 2 FEET ABOVE GRADE	DECOMMISIONED (ECN 634307), DECOMMISIONING INCLUDED FILLING W/ GROUT AND REMOVING CASING 12" BELOW GRADE (WELL COMPLETION REPORT)											

241 - U - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cled	Report	Drill	Gamma	Recon-cled	m	Installed				HW-44355.0	HW-44355.1	HW-44255.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
60-00-02	299-W19-054	241-U-131	A7753	38197	75577	135103.5	566860.2	10		10	10.25	10	12/10	153		153.0	153	46.6	11/30/44	CI			XX	X	X	X	X	X	XX	XX	XX	XX	XX
60-00-05	299-W19-053	241-U-135	A7752	37898	75577	135012.4	566860.4		10	10	10.125		12/10	148	148.0	148.0	148	45.1	10/30/44	CI		10 &12" CASING	XX	X	X	X	X	X	XX	XX	XX	XX	XX
60-00-06	299-W18-051	241-U-136	A7534	37822	75700	134989.1	566823.0	10	10	10	10.125		12/10	151	150.0	151.0	150	45.7	10/24/44	CI		10 &12" CASING	XX	X	X	X	X	X	XX	XX	XX	XX	XX
60-00-08	299-W18-055	241-U-134	A7538	37935	75908	135023.4	566759.5	10	10	10	10		12/10	150	150.0	150.0	150	45.7	11/10/44	CI		10 &12" CASING	XX	X	X		X	X	X	X	XX	XX	XX
60-00-10	299-W18-053	241-U-132	A7536	38135	75908	135084.4	566759.3	10	10	10	10.125		12/10	150	150.6	150.0	150	45.7	11/11/44	CI		10 &12" CASING	XX	X	X	X	X	X	XX	XX	XX	XX	XX
60-00-11	299-W18-052	241-U-130	A7535	38263	75775	135123.4	566799.9	10	12/10	10	10.125	10	12/10	150	150.0		150	45.7	11/07/44	CI	PERFORATED 48' to 148', 1/2 sack of cement on bottom	10 &12" CASING (10" WELL), 24"DIA PAD, RESOURCE PROTECTION WELL REPORT	XX	X	X	X	X	X	XX	XX	XX	XX	XX
60-01-08	299-W18-135		A7618	38177	75690	135097.3	566825.7	6		6	6.125	6	6	125	125.0	125.0	125	38.1	04/24/74	F								x	X	X	X	X	X
60-01-10	299-W18-136		A7619	38217	75687	135109.5	566826.6	6	6	6	6.125	6	6	100	100.0	100.0	100	30.5	03/26/75	F								x	X	X	X	X	X
60-02-01	299-W18-137		A7620	38244	75717	135117.7	566817.5	6	6	6	6	6	6	125	125.0	124.6	125	38.1	04/13/74	F		E-TAPED						x	X	X	X	X	X
60-02-05	299-W18-138		A7621	38164	75707	135093.3	566820.6	6	6	6	6.125	6	6	100	100.0	100.0	100	30.5	05/14/75	F								x	X	X	X	X	X
60-02-07	299-W18-139		A7622	38151	75757	135089.3	566805.3	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	03/21/74	F								x	X	X	X	X	X
60-02-08	299-W18-140		A7623	38186	75778	135100.0	566798.9	6	6	6	6	6	6	100	105.0	99.0	105	32.0	02/20/76	F		6 & 8" CASING						x	X	X	X	X	X
60-02-10	299-W18-141		A7624	38217	75787	135109.4	566796.1	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	08/21/74	F								x	X	X	X	X	X
60-02-11	299-W18-142		A7625	38244	75757	135117.7	566805.3	6	6	6	6.125	6	6	100	100.0	100.0	100	30.5	03/17/75	F								x	X	X	X	X	X
60-03-01	299-W18-143		A7626	38244	75817	135117.6	566787.0	6	6	6	6	6	6	100	100.0	100.0	100	30.5	03/13/75	F								x	X	X	X	X	X
60-03-05	299-W18-144		A7627	38151	75322	135089.7	566937.9	6	6	6	6	6	6	125	125.0	125.0	125	38.1	04/01/74	F								x	X	X	X	X	X
60-03-08	299-W18-145		A7628	38177	75885	135097.2	566766.3	6	6	6	6	6	6	125	125.6		125	38.1	05/02/74	F								x	X	X	X	X	X
60-03-10	299-W18-146		A7629	38217	75885	135109.4	566766.3	6	6	6	6	6	6	100	100.0	100.0	100	30.5	11/01/75	F								x	X	X	X	X	X
60-03-11	299-W18-147		A7630	38244	75857	135117.6	566774.8	6	6	6	6	6	6	125	125.0	125.0	125	38.1	08/28/74	F								x	X	X	X	X	X
60-04-03	299-W19-076		A7776	38095	75593	135072.4	566855.4	6	6	6	6	6	6	125	125.0		125	38.1	08/07/74	F								x	X	X	X	X	X
60-04-08	299-W18-124		A7607	38077	75683	135066.8	566827.9	6		6	6	6	6	120	120.0	118.8	120	36.6	02/01/74	F		E-TAPED						x	X	X	X	X	X
60-04-10	299-W18-125		A7608	38111	75683	135077.2	566827.9	6		6	6.125	6	6	120	120.0	118.6	120	36.6	02/12/74	F		E-TAPED						x	X	X	X	X	X
60-04-12	299-W18-126		A7609	38143	75637	135087.0	566841.9	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	03/28/74	F								x	X	X	X	X	X
60-05-04	299-W18-176		A7658	38074	75698			6	6	6	6	6	6		76.0	73.0	76	23.2	08/29/78	F	GROUTED	GROUTED T&B/ 6 & 8" CASING/ E-TAPED/ WELL COMPLETION REPORT								XXC	XXC	XXC	XXC
60-05-05	299-W18-127		A7610	38047	75722	135057.7	566816.1	6	6	6	6	6	6	125	125.0	123.8	125	38.1	05/30/74	F		E-TAPED						x	X	X	X	XX	X
60-05-07	299-W18-128		A7611	38047	75757	135057.7	566805.4	6	6	6	6	6	6	125	125.0	125.0	125	38.1	05/21/74	F								x	X	X	X	XX	X
60-05-08	299-W18-129		A7612	38077	75787	135066.8	566796.3	6	6	6	6	6	6	125	125.0	125.0	125	38.1	04/05/74	F								x	X	X	X	XX	X
60-05-10	299-W18-130		A7613	38117	75787	135079.0	566796.2	6	6	6	6	6	6	100	100.0	100.0	100	30.5	05/07/74	F								x	X	X	X	XX	X
60-06-07	299-W18-131		A7614	38051	75857	135058.8	566774.9	6	6	6	6.125	6	6	125	125.0		125	38.1	07/26/74	F		RESOURCE PROTECTION WELL REPORT,24" DIA PAD						x	X	X	X	XX	X
60-06-08	299-W18-132		A7615	38077	75885	135066.7	566766.4	6	6	6	6.125	6	6	100	100.0		100	30.5	05/01/75	F		RESOURCE PROTECTION WELL REPORT,24" DIA PAD						x	X	X	X	XX	X
60-06-10	299-W18-133		A7616	38117	75885	135078.9	566766.4	6	6	6	6.125	6	6	125	125.0		125	38.1	04/19/74	F		RESOURCE PROTECTION WELL REPORT,24" DIA PAD						x	X	X	X	XX	X
60-06-11	299-W18-134		A7617	38141	75857	135086.2	566774.9	6	6*8	6	6.125	6	6*8	100	105.0		105	32.0	02/03/76	F		6&8" CASING, 8" CASING PULLED,GROUTED T&B,RESOURCE PROTECTION WELL REPORT,24" DIA PAD						x	X	X	X	XX	X
60-07-01	299-W18-114		A7597	38043	75617	135056.5	566848.1	6	6	6	6	6	6	100	105.0	98.8	105	32.0	01/28/76	F		E-TAPED						x	X	X	X	XX	X
60-07-02	299-W19-074		A7774	38017	75594	135048.6	566855.1	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	08/13/74	F								x	X	X	X	XX	X
60-07-10	299-W18-116		A7599	38017	75678	135048.6	566829.5	6	6*8	6	6	6	6	100	105.0		105	32.0	01/28/76	F		GROUTED						x	X	X	X	XX	X
60-07-11	299-W18-117		A7600	38043	75657	135056.5	566835.9	6	6	6	6	6	6	125	52.0	124.3	125	38.1	04/26/74	F		E-TAPED/ INCOMPLETE DRILL LOG,RESOURCE PROTECTION WELL REPORT,24" DIA PAD						x	X	X	X	XX	X
60-08-04	299-W18-115		A7598	38976	75692	135340.8	566824.5	6	6	6	6	6	6	125	125.0	128.1	125	38.1	03/13/74	F		E-TAPED, RESOURCE PROTECTION WELL REPORT,24" DIA PAD,CASING 10" ABOVE PAD						x	X	X	X	XX	X
60-08-08	299-W18-118		A7601	37977	75787	135036.3	566796.3	6	6	6	6	6	6	100	105.0	105.0	105	32.0	01/27/76	F		6 & 8" CASING						x	X	X	X	XX	X
60-08-09	299-W18-119		A7602	38017	75787	135048.5	566796.3	6	6	6	6	6	6	125	125.0	124.9	125	38.1	05/14/74	F								x	X	X	X	XX	X
60-08-10	299-W18-054	241-U-133	A7537	38035	75775	135054.0	566799.9	6	10	6	10.125	6	12/10	150	150.0	150.0	150	45.7	10/30/44	F		10 & 12" CASING	XX	X	X		X	X	X	X	XX	XX	XX
60-09-01	299-W18-120		A7603	38041	75818	135055.8	566786.8	6	6	6	6	6	6	100	100.0	100.0	100	30.5	02/10/76	F		6 & 8" CASING/ GROUTED 100-105						x	X	X	X	XX	X
60-09-07	299-W18-121		A7604	37956	75862	135029.8	566773.5	6	6	6	6	6	6	100	105.0	100.0	105	32.0	02/12/76	F		6 & 8" CASING						x	X	X	X	XX	X
60-09-08	299-W18-122		A7605	37977	75887	135036.2	566765.9	6		6	6	6	6	120	120.0	120.0	120	36.6	02/05/74	F								x	X	X	X	XX	X
60-09-10	299-W18-123		A7606	38017	75887	135048.4	566765.8	6	6	6	6	6	6	125	125.0	125.0	125	38.1	07/11/74	F								x	X	X	X	XX	X
60-10-01	299-W18-100		A7583	37943	75617	135026.1	566848.2	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	09/05/74	F								X	X	X	X	XX	X
60-10-02	299-W19-075		A7775	37920	75600	135019.1	566853.4	6	6	6	6.125	6	6	100	105.0	105.0	105	32.0	02/17/76	F		6 & 8" CASING						x	X	X	X	XX	X
60-10-05	299-W18-104		A7587	37857	75612	134999.9	566849.8	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	06/25/74	F								x	X	X	X	XX	X
60-10-07	299-W18-148		A7631	37857	75657	134999.8	566836.0	6		6	6.125	6	6	120	120.0	120.0	120	36.6	02/08/74	F								x	X	X	X	XX	X

241 - U - FARM WELLS

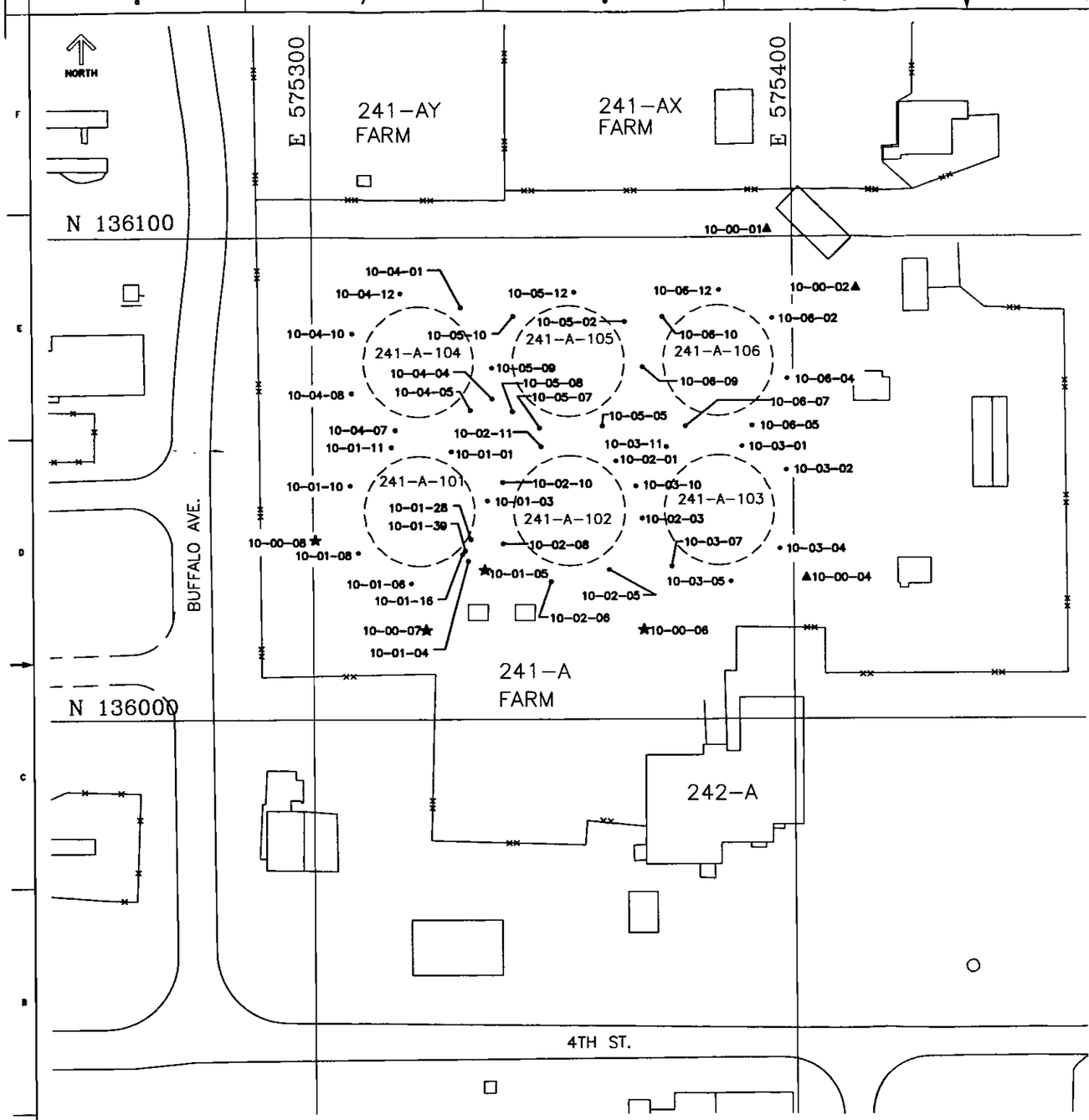
WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-cilled	Report	Drill	Gamma	Recon-cilled	m	Installed				HW-44355.0	HW-44355.1	HW-44355.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8900
60-10-11	299-W18-107		A7590	37943	75657	135026.0	566836.0		6*8		6.125	6	6	100	105.0	99.3	105	32.0	01/21/76	F		6 & 8" CASING,PULLED 8" CASING,GROUTED T&B,RESOURCE PROTECTION WELL RPORT						x	x	x	x	x	X

241 - U - FARM WELLS

WELL NUMBER				COORDINATES				WELLS/BOREHOLES													COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM	SITE	PREVIOUS	Wa. STATE	HANFORD (ft)		LAMBERT (m)		Dia. (in.)						DEPTH (ft)					DATE	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993
#	#	#	#	NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Gamma	Cap	Recon-ciled	Report	Drill	Gamma	Recon-ciled	m	Installed				HW-44355.0	HW-44355.1	HW-44355.2	BNWL-928	BNWL-1739	BNWL-1981	BNWL-2296	PNL-2894	PNL-5397	PNL-6907	PNL-8800
60-11-03	299-W18-102		A7585	37901	75686	135013.2	566827.2	6		6	6	6	6	125	125.0	125.0	125	38.1	07/13/73	F								x	X	X	X	XX	X
60-11-05	299-W18-109		A7592	37857	75717	134999.8	566817.8	6	6	6	6.125	6	6	125	125.0	125.0	125	38.1	05/11/74	F								x	X	X	X	XX	X
60-11-06	299-W18-101		A7584	37850	75737	134997.6	566811.7	6		6	6	6	6	125	125.0	125.0	125	38.1	07/13/73	F								x	X	X	X	XX	X
60-11-07	299-W18-110		A7593	37857	75763	134999.7	566803.7	6		6	6	6	6	125	125.0	123.6	125	38.1	05/22/74	F		E-TAPED						x	X	X	X	XX	X
60-11-12	299-W18-105		A7588	37947	75737	135027.2	566811.6	6		6	6	6	6	125	125.0	124.4	125	38.1	06/26/73	F		E-TAPED						x	X	X	X	XX	X
60-12-01	299-W18-113		A7596	37940	75817	135025.0	566787.2	6	6	6	6.125	6	6	125	125.0	123.0	125	38.1	07/11/74	F								x	X	X	X	XX	X
60-12-03	299-W18-103		A7586	37900	75786	135012.8	566796.7	6		6	6	6	6	125	125.0	125.2	125	38.1	06/15/73	F		E-TAPED						x	X	X	X	XX	X
60-12-05	299-W18-092	241-U-139, 241-U-3	A7575	37855	75820	134999.1	566786.4	6		6	6	6	6	100	100.5	97.0	100	30.5	06/19/70	F							X	X	X	X	X	XX	X
60-12-07	299-W18-090	241-U-138, 241 U-1	A7573	37857	75860	134999.7	566774.2	6		6	6.125	6	6	100	100.5	97.0	100	30.5	06/24/70	F							X	X	X	X	X	XX	X
60-12-10	299-W18-091	241-U-137, 241-U-2	A7574	37920	75876	135018.9	566769.2	6		6	6	6	6	100	100.5	97.0	100	30.5	06/17/70	F							X	X	X	X	X	XX	X
NA	299-W18-111		A7594	NA	NA								NA				NA		NA	I	CASING REMOVED										XXC	XC	XXC

APPENDIX H

SKETCHES



241-A TANK FARM

241-A FARM WELLS

WELL NUMBER FARM#	SITE#	STATE#	Dia In	Depth ft	DATE Installed	TYPE
10-04-04	299-E25-056	A6045	8	151	06/02/55	F1
10-04-05	299-E25-063	A6502	6	75	04/16/62	F
	DEEPENED		6	130	11/02/76	F
10-04-07	299-E24-066	A5921	6	75	05/03/62	F
	DEEPENED		6	125	10/28/76	F
10-04-08	299-E24-067	A5922	8	75	06/28/56	F1
	DEEPENED		8	130	10/28/76	F1
10-04-10	299-E24-068	A5923	4*6	75	05/04/62	G
	DEEPENED		4*7	122	11/03/76	G
10-04-12	299-E24-069	A5924	6	75	05/31/62	F
	DEEPENED		6	123	07/25/78	F
10-05-02	299-E25-068	A6507	4*6	75	05/08/62	F
	DEEPENED		4*7	122	07/25/78	F
10-05-05	299-E25-070	A6509	6	75	04/05/62	F
10-05-07	299-E25-071	A6510	6	75	04/12/62	F
10-05-08	299-E25-098	A6533	6	30	01/26/66	F
10-05-09	299-E25-062	A6501	6	75	04/24/62	F
	DEEPENED		6	125	04/24/62	F
10-05-10	299-E25-066	A6505	6	75	04/26/62	F
	DEEPENED		6	130	05/22/78	F
10-05-12	299-E25-067	A6506	6	75/125	04/12/62	F
10-06-02	299-E25-074	A6513	6	75	05/02/62	F
	DEEPENED		6	130	08/02/78	F
10-06-04	299-E25-075	A6514	6	75	05/01/62	F
	DEEPENED		6	130	08/08/78	F
10-06-05	299-E25-076	A6515	6	75	04/30/62	F
10-06-07	299-E25-077	A6516	6	75	02/01/62	F
	DEEPENED		6	130	07/18/78	F
10-06-09	299-E25-069	A6508	6	75	04/08/64	F
	DEEPENED		6	130	07/12/78	F
10-06-10	299-E25-072	A6511	6	75	04/10/62	F
	DEEPENED		6	130	07/17/78	F
10-06-12	299-E25-073	A6512	4*6	75	05/08/62	G
	DEEPENED		4*7	110	07/25/78	G
NA	299-E25-051	A6040	8	80	12/08/52	F1

241-A FARM WELLS

WELL NUMBER FARM#	SITE#	STATE#	Dia In	Depth ft	DATE Installed	TYPE
10-00-01	299-E25-057	A6046	8	150	06/08/55	D
10-00-02	NA	NA	NA	NA	NA	NA
10-00-04	299-E25-058	A6047	8	151	06/30/55	D
10-00-06	299-E25-015	A4763	4*6	343	08/14/69	B1
10-00-07	299-E25-016	A8030 A4750	4*6	343	06/30/69	B1
10-00-08	299-E25-013	A4749	4*6	343	09/11/69 06/19/75	B1
10-01-01	299-E25-097	A6532	6	75	02/28/62	F
10-01-03	299-E25-091	A6530	6	75	04/01/62	F
10-01-04	299-E25-092	A6531	6	75	04/09/62	F
10-01-05	299-E25-001	A4759	4/8	322	02/25/55	B1
10-01-06	299-E24-070	A5925	6	125	04/01/62	F
10-01-08	299-E24-071	A5926	6	75	02/13/62	F
	DEEPENED		6	130	09/12/78	F
10-01-09	NA	B8052	6	73	NA	F
10-01-10	299-E24-072	A5927	6	75	05/03/62	F
10-01-11	299-E24-073	A5928	6	75	05/02/62	F
	DEEPENED		6	130	09/01/78	F
10-01-16	299-E25-170	A6585	4*6	50	01/01/66	G
10-01-28	299-E25-204	A6608	6	44	01/13/84	F
10-01-39	299-E25-192	A6598	6	45	03/01/82	F
10-02-01	299-E25-090	A6529	6	75	04/21/62	F
	DEEPENED		6	130	07/11/78	F
10-02-03	299-E25-083	A6522	6	75	04/20/62	F
	DEEPENED		6	130	05/30/78	F
10-02-05	299-E25-085	A6524	6	75	04/18/62	F
	DEEPENED		6	130	06/05/78	F
10-02-06	299-E25-086	A6525	6	75	04/17/62	F
	DEEPENED		6	90	06/01/78	F
10-02-08	299-E25-087	A6526	6	75	04/30/62	F
	DEEPENED		6	130	06/15/78	F
10-02-10	299-E25-088	A6527	6	75	02/09/62	F
	DEEPENED		6	130	06/20/78	F
10-02-11	299-E25-089	A6528	6	75	04/01/62	F
	DEEPENED		6	130	06/29/78	F
10-03-01	299-E25-078	A6517	6	75	05/01/62	F
	DEEPENED		6	130	09/22/78	F
10-03-02	299-E25-079	A6518	6	75	04/30/62	F
	DEEPENED		6	130	04/30/78	F
10-03-04	299-E25-080	A6519	6	75	04/27/62	F
	DEEPENED		6	130	05/05/78	F
10-03-05	299-E25-081	A6520	6	75	04/26/62	F
	DEEPENED		6	130	05/10/78	F
10-03-07	299-E25-082	A6521	6	75	04/24/62	F
	DEEPENED		6	130	05/26/78	F
10-03-10	299-E25-055	A6044	6	151	05/31/55	F
10-03-11	299-E25-084	A6523	6	85	04/07/64	F
10-04-01	299-E25-061	A6500	6	75	05/07/62	F
	DEEPENED		6	130	10/29/76	F
NA	299-E24-065	NA	8	40	12/01/52	F1
	DEEPENED			80		
NA	299-E25-152	NA	NA	42	02/01/81	H1
NA	299-E25-171	NA	NA	15	12/01/80	H1
NA	299-E25-172	NA	NA	15	12/01/80	H1
NA	299-E25-148	NA	NA	42	02/01/81	H1
NA	299-E25-149	NA	NA	43	02/01/81	H1

SYMBOL LEGEND

★ PRIORITY 1 WELLS

▲ PRIORITY 2 WELLS

● PRIORITY 3 WELLS

⊠ DECOMMISSION WELLS- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DRAWING TRACEABILITY LIST			
DWG NO	TITLE	REF NUMBER	TITLE
		NEXT USED ON	REFERENCES

REVISIONS		
1	LINE COMMENTS INCORPORATE ENGINEERS RED	PRW 9/19/88

NAME	DATE
BJ WILLIAMS	8-25-88
GADDIS	

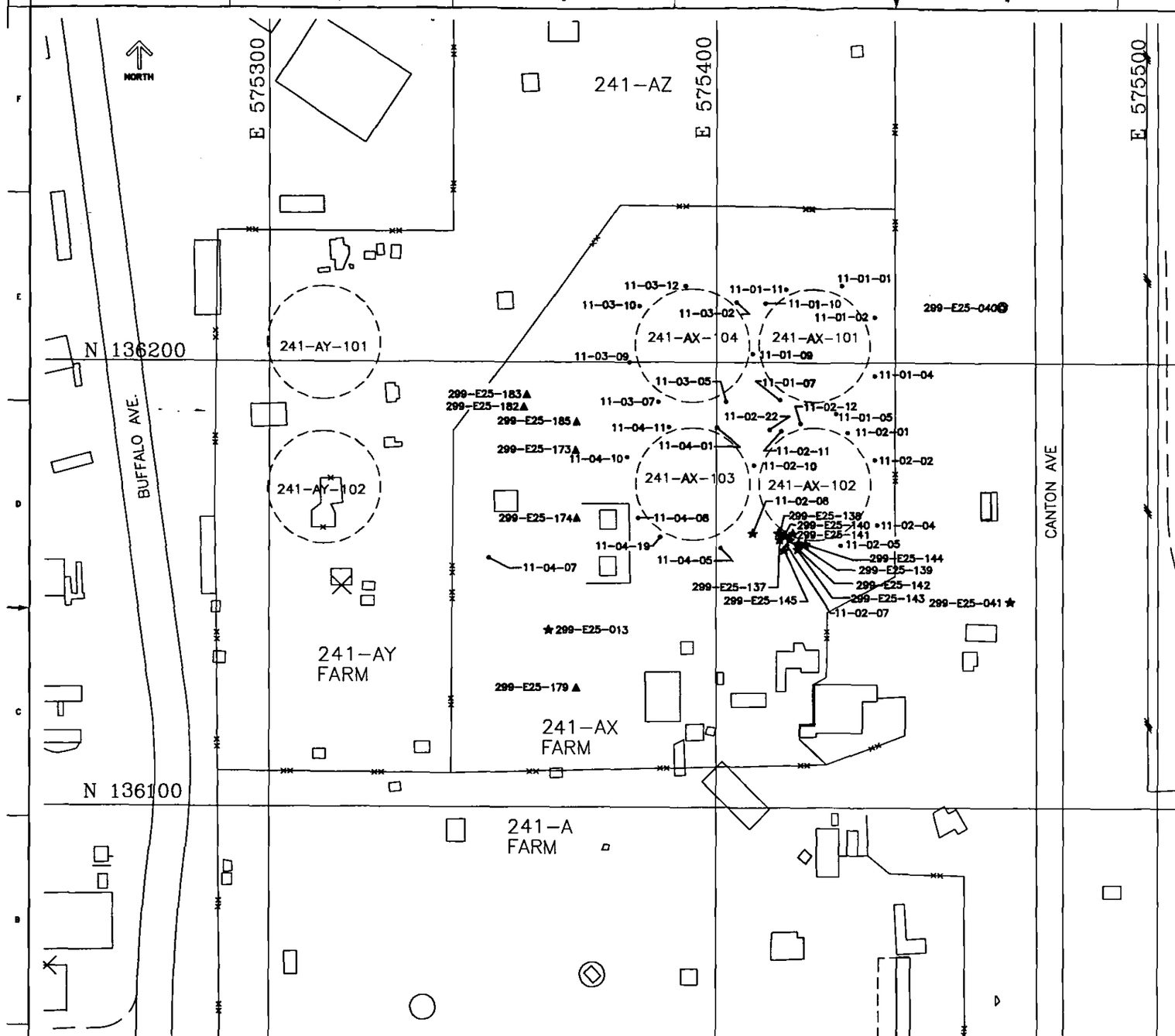
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WELLS
241-A FARM

F | ES-050051-C3 | 1

SCALE 1:200(METERS) | SHEET 1 OF

ES-050051-C3 | REV 1 | SH 1 OF 1



241-AX TANK FARM

241-AX FARM WELLS

WELL NUMBER FARM#	SITE#	STATE#	Dia In	Depth ft	DATE Installed	TYPE
11-01-01	299-E25-099	A6534	6	100	11/26/74	F
11-01-02	299-E25-100	A6535	6	100	12/02/74	F
11-01-04	299-E25-101	A6537	6	100	01/15/75	F
11-01-05	299-E25-102	A6538	6	100	01/17/75	F
11-01-07	299-E25-103	A6539	6	100	01/23/75	F
11-01-09	299-E25-104	A6540	6	100	12/23/74	F
11-01-11	299-E25-105	A6541	6	100	12/10/74	F
11-02-02	299-E25-106	A6542	6	100	01/04/75	F
11-02-04	299-E25-107	A6543	6	100	02/21/75	F
11-02-05	299-E25-108	A6544	6	100	02/03/75	F
11-02-07	299-E25-109	A6545	6	100	02/12/75	F
11-02-08	299-E25-110	A6546	6	100	02/14/75	H
11-02-10	299-E25-111	A6547	6	100	02/18/75	F
11-02-11	299-E25-112	A6548	6	100	01/21/75	F
11-03-02	299-E25-113	A6549	6	100	01/30/75	F
11-30-05	299-E25-114	A6550	6	100	12/24/74	F
11-03-07	299-E25-115	A6551	6	100	02/25/75	F
11-03-09	299-E25-116	A6552	6	120	01/27/75	F
11-03-10	299-E25-117	A6553	6	100	01/03/75	F
11-03-12	299-E25-118	A6554	6	100	12/13/74	F
11-04-01	299-E25-119	A6555	6	100	12/30/74	F
11-04-05	299-E25-120	A6556	6	100	02/20/75	F
11-04-07	299-E25-121	A6557	6	95.8	03/05/75	F
11-04-08	299-E25-122	A6558	6	100	02/28/75	F
11-04-10	299-E25-123	A6559	6	100	03/04/75	F
11-04-11	299-E25-124	A6560	6	100	01/24/75	F
	DEEPENED			130	04/01/78	F
11-02-22	299-E25-127	A6561	6	71	05/29/75	F
	DEEPENED			120	04/27/78	F
11-02-12	299-E25-128	B2899	6	54	05/25/75	F
11-02-23	NA	A6562	6	54	05/25/75	F
11-01-10	299-E25-131	B2896	6	73	NA	F
11-02-01	299-E25-132	A6563	6	130	04/04/78	F
11-02-03	299-E25-133	B2898	6	75	01/01/78	F
NA	299-E25-137	NA	4	80	12/31/60	H
NA	299-E25-138	NA	4	80	12/31/60	H
NA	299-E25-139	NA	4	80	12/31/60	H
NA	299-E25-140	NA	4	80	12/31/60	H
NA	299-E25-141	NA	4	52.5	12/31/60	H
NA	299-E25-142	NA	4	80	12/31/60	H
NA	299-E25-143	NA	4	80	12/31/60	H
NA	299-E25-144	NA	4	80	12/31/60	H
NA	299-E25-145	NA	2	80	12/31/60	H
11-04-19	299-E25-147	A6565	6	130	03/01/78	F
NA	299-E25-013	A4762	8	317	10/01/63	B
NA	299-E25-040	A4789	4	274	09/01/89	B
NA	299-E25-041	A4790	4	279	09/01/89	B
NA	299-E25-173	A6588	6	19	07/01/81	F
NA	299-E25-174	A6589	6	18	07/01/81	F
NA	299-E25-179	A6590	6	16	07/01/81	F
NA	299-E25-182	A6592	6	12	08/01/81	F
NA	299-E25-183	A6593	6	12	07/01/81	F
NA	299-E25-185	A6595	6	15	08/01/81	F

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REV	DESCRIPTION	CHKD
1	LINE COMMENTS INCORPORATE ENGINEERS RED	

REVISIONS

	NAME
DRAWN BY	EN WILLIAMS
CHECKED BY	GADDIS

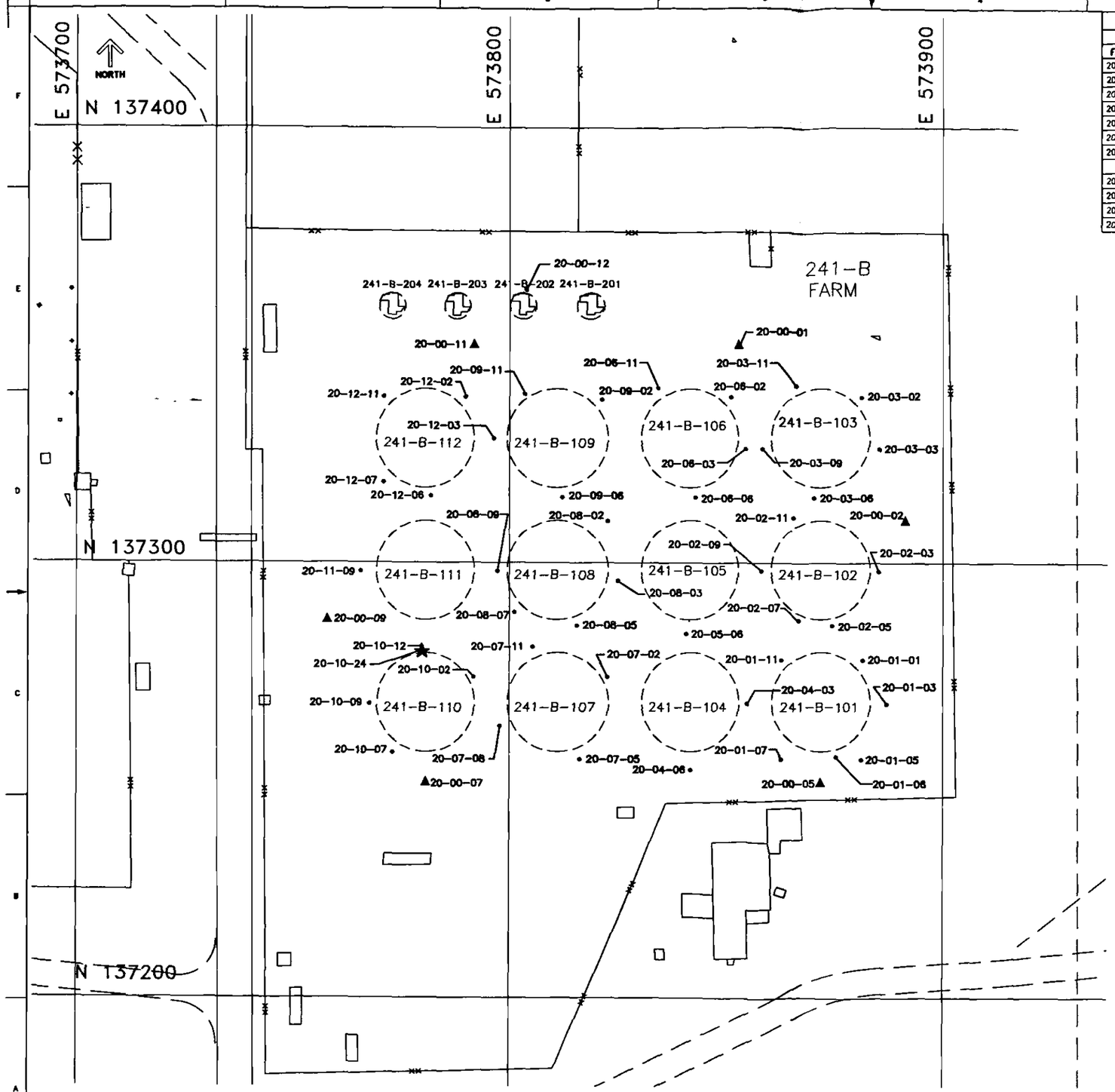
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WELLS
241-AX FARM

F | XXXX | XXXX | ES-050051-C3 | 1

SCALE 1:200(METERS) | XXXXXXX | SHEET 2 OF

ES-050051-C3 | SH 2 OF | REV 1



241-B TANK FARM

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMISSION WELLS– NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-B FARM WELLS

WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	in	ft	Installed	
20-10-02	299-E33-213	A7020	6	100	08/10/73	F
20-10-07	299-E33-216	A7023	6	100	09/17/73	F
20-10-09	299-E33-215	A7022	6	135	09/20/73	F
20-10-12	299-E33-214	A7021	6	120	08/03/73	F
20-10-24	299-E33-273	A7073	6	24	05/22/75	H
20-11-09	299-E33-217	A7024	6	120	05/30/73	F
20-12-02	299-E33-201	A7009	6	100	01/07/72	F
	DEEPENED			125	04/20/73	F
20-12-03	299-E33-199	A7007	6	100	02/03/72	F
20-12-06	299-E33-202	A7010	6	100	01/10/72	F
20-12-07	299-E33-203	A7011	6	100	01/12/72	F
20-12-11	299-E33-204	A7012	6	100	01/20/72	F

241-B FARM WELLS

WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	in	ft	Installed	
20-00-01	299-E33-053	A6861	12/10	151	12/07/44	C
20-00-02	299-E33-051	A6859	12/10	151	11/30/44	C
20-00-05	299-E33-052	A6860	12/10	154	11/28/44	C
20-00-07	299-E33-056	A6862	12/10	150	12/06/44	C
20-00-09	299-E33-057	A6865	12/10	150	12/07/44	C
20-00-11	299-E33-055	A6863	12/10	159	12/15/44	C
20-00-12	NA	NA	NA	NA	NA	NA
20-00-23	NA	NA	6	NA	NA	NA
20-01-01	299-E33-261	A7068	6	100	06/07/74	F
20-01-03	299-E33-220	A7027	6	135	05/16/73	F
20-01-05	299-E33-262	A7069	6	100	06/04/74	F
20-01-06	299-E33-274	A7074	6	60	05/20/75	F
20-01-07	299-E33-263	A7070	6	100	05/30/74	F
20-01-11	299-E33-264	A7071	6	100	06/03/74	F
20-02-03	299-E33-179	A6987	6	100	02/25/72	F
20-02-05	299-E33-180	A6988	6	100	03/09/72	F
	DEEPENED			140	05/02/73	F
20-02-07	299-E33-181	A6989	6	100	03/07/72	F
20-02-09	299-E33-182	A6990	6	100	02/15/72	F
20-02-11	299-E33-183	A6991	6	100	02/17/71	F
20-03-02	299-E33-184	A6992	6	100	02/10/72	F
	DEEPENED			115	04/27/73	F
20-03-03	299-E33-185	A6993	6	100	02/29/72	F
20-03-06	299-E33-186	A6994	6	100	02/22/72	F
	DEEPENED			135	04/18/73	F
20-03-09	299-E33-187	A6995	6	100	01/18/72	F
20-03-11	299-E33-188	A6996	6	100	02/08/72	F
20-04-03	299-E33-219	A7026	6	100	05/07/73	F
20-04-06	299-E33-221	A7028	6	135	06/05/73	F
20-05-06	299-E33-218	A7025	6	120	05/22/73	F
20-06-02	299-E33-189	A6997	6	100	02/01/72	F
	DEEPENED		6	140	03/03/72	F
20-06-03	299-E33-190	A6998	6	100	03/03/72	F
	DEEPENED		6	140	04/25/73	F
20-06-06	299-E33-191	A6999	6	100	03/01/72	F
	DEEPENED		6	125	01/13/72	F
20-06-11	299-E33-192	A7000	6	100	01/13/72	F
	DEEPENED		6	125	04/19/73	F
20-07-02	299-E33-212	A7019	6	100	08/22/73	F
20-07-05	299-E33-149	A6957	6	100	04/14/70	F
	DEEPENED		6	135	04/16/73	F
20-07-08	299-E33-148	A6956	6	100	04/30/70	F
	DEEPENED		6	135	04/13/73	F
20-07-11	299-E33-147	A6955	6	100	04/20/70	F
20-08-02	299-E33-054	A6862	12/10	170	12/18/44	C
	DEEPENED		6	135	03/13/72	F
20-08-03	299-E33-193	A7001	6	100	03/13/72	F
	DEEPENED		6	135	04/17/73	F
20-08-05	299-E33-194	A7002	6	100	03/15/72	F
20-08-07	299-E33-195	A7003	6	100	03/17/72	F
	DEEPENED		6	103	02/07/72	F
20-08-09	299-E33-196	A7004	6	100	02/07/72	F
	DEEPENED		6	130	04/13/73	F
20-09-02	299-E33-197	A7005	6	100	01/18/72	F
20-09-06	299-E33-198	A7006	6	100	02/08/72	F
	DEEPENED		6	100	01/12/72	F
20-09-11	299-E33-200	A7008	6		01/12/72	F
	DEEPENED		6	100	04/16/73	F

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON ES-E051301-1	

REV	DESCRIPTION	BY	DATE
1	LINE COMMENTS INCORPORATE ENGINEER RED	FRW	1/18/05

REVISIONS

NAME	DATE
BJ WILLIAMS	4/26/05
GADDIS	

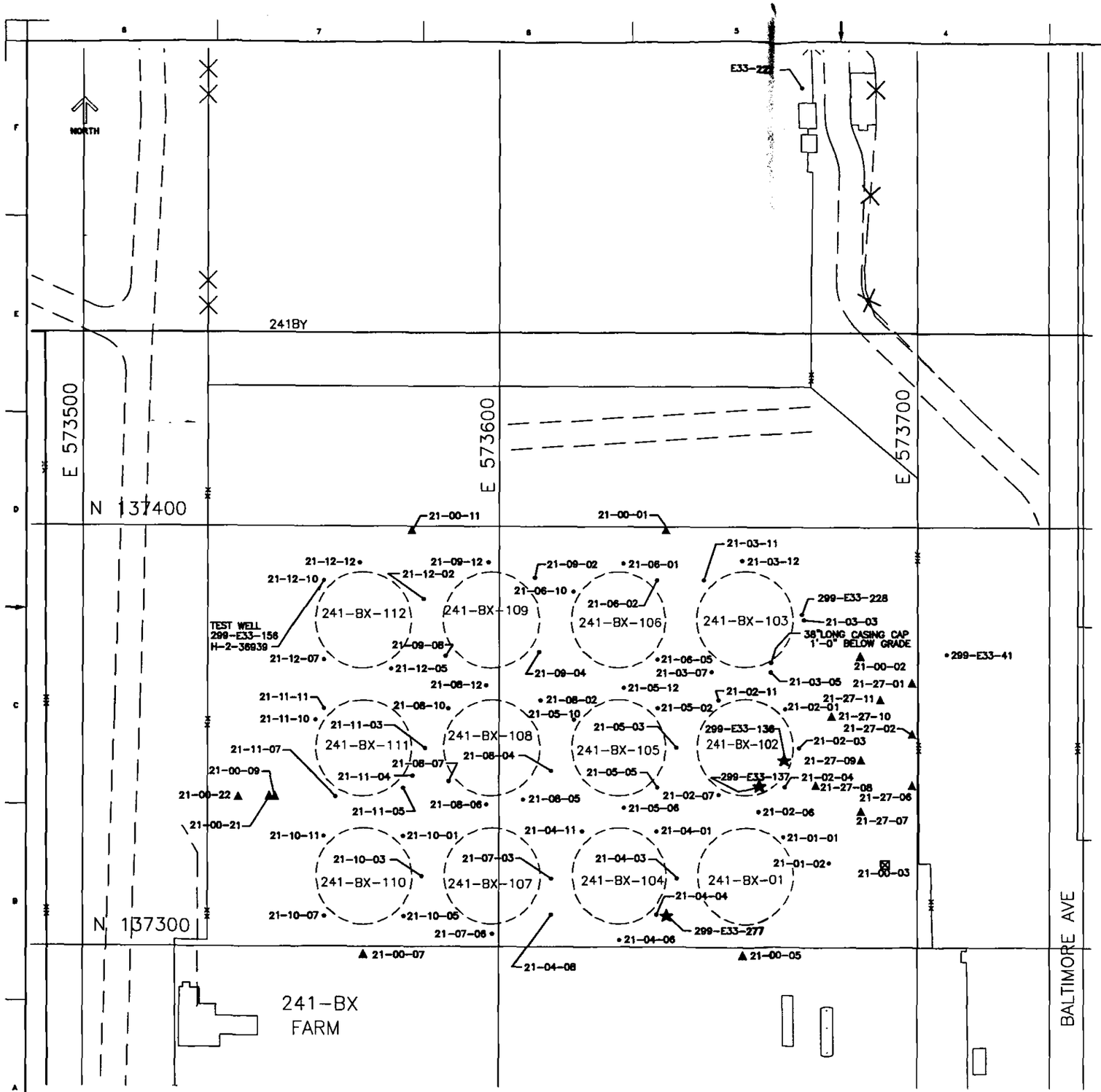
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WELLS
241-B FARM

F | ES-050051-C3 | REV 1

SCALE 1:200 (METERS) | SHEET 3 OF

ES-050051-C3



241-BX-FARM WELLS

WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
21-00-01	299-E33-063	A6871	8	150	3/4/48	D
21-00-02	299-E33-142	A6950	6	100	7/1/70	F
21-00-03	299-E33-140	A6948	6	100	5/27/70	I
21-00-05	299-E33-062	A6870	8	135	3/5/48	D
21-00-07	299-E33-077	A6885	8	150	2/28/48	D
21-00-09	299-E33-092	A6900	6	75	4/14/67	F
21-00-11	299-E33-065	A6873	8	150	11/21/47	D
21-00-21	299-E33-078	A6886	8	150	3/1/48	D
21-00-22	299-E33-093	A6901	6	75	4/26/67	F
21-01-01	299-E33-144	A6952	6	100	8/4/70	F
21-01-02	299-E33-135	A6943	6	100	5/18/70	F
21-02-01	299-E33-129	A6937	6	100	4/27/70	F
21-02-03	299-E33-145	A6953	6	100	8/6/70	F
21-02-04	299-E33-027	A4851	6	255	7/23/70	G1
	Deepened			265	10/16/76	G1
21-02-06	299-E33-143	A6951	6	100	7/31/70	F
21-02-07	299-E33-130	A6938	6	100	4/22/70	F
21-02-11	299-E33-131	A6939	6	100	4/23/70	F
21-03-03	299-E33-239	A7046	6	100	10/16/73	F
21-03-05	299-E33-229	A7036	6	100	11/2/73	F
21-03-07	299-E33-282	A7081	6	105	1/2/76	F
21-03-11	299-E33-275	A7075	6	100	1/7/76	F
21-03-12	299-E33-238	A7045	6	100	10/25/73	F
21-04-01	299-E33-281	A7080	6	100	4/5/77	F
21-04-03	299-E33-226	A7033	6	100	10/3/73	F
21-04-04	299-E33-278	A7077	6	105	5/3/77	F
21-04-06	299-E33-224	A7031	6	100	10/1/73	F
21-04-08	299-E33-279	A7078	6	100	4/25/77	F
21-04-11	299-E33-280	A7079	6	100	4/14/77	F
21-05-02	299-E33-158	A6966	6	100	11/30/71	F
21-05-03	299-E33-159	A6967	6	100	11/24/71	F
21-05-05	299-E33-160	A6968	6	100	11/18/71	F
21-05-06	299-E33-161	A6969	6	100	11/22/71	F
21-05-10	299-E33-162	A6970	6	100	12/15/71	F
21-05-12	299-E33-157	A6965	6	100	12/10/71	F
21-06-01	299-E33-163	A6971	6	100	12/7/71	F
21-06-02	299-E33-164	A6972	6	100	12/3/71	F
21-06-05	299-E33-165	A6973	6	100	12/1/71	F
21-06-10	299-E33-166	A6974	6	100	12/9/71	F
21-07-03	299-E33-225	A7032	6	100	9/27/73	F
21-07-06	299-E33-222	A7029	6	100	9/27/73	F
21-08-02	299-E33-064	A6872	8	150	11/20/47	D
21-08-04	299-E33-234	A7041	6	100	9/19/73	F
21-08-05	299-E33-235	A7042	6	100	9/26/73	F
21-08-06	299-E33-151	A6959	6	100	1/6/72	F
21-08-07	299-E33-152	A6960	6	100	1/5/72	F
21-08-10	299-E33-236	A7043	6	100	10/5/73	F
21-08-12	299-E33-150	A6958	6	100	1/30/72	F
21-09-02	299-E33-257	A7064	6	100	12/17/73	F
21-09-04	299-E33-233	A7040	6	100	10/9/73	F
21-09-08	299-E33-258	A7065	6	100	12/18/73	F
21-09-12	299-E33-231	A7038	6	100	10/12/73	F
21-10-01	299-E33-167	A6975	6	100	9/9/71	F
21-10-03	299-E33-223	A7030	6	100	9/24/73	F
21-10-05	299-E33-168	A6976	6	100	9/13/71	F
21-10-07	299-E33-169	A6977	6	100	9/15/71	F
21-10-11	299-E33-170	A6978	6	100	9/17/71	F
21-11-03	299-E33-237	A7044	6	100	10/2/73	F
21-11-04	299-E33-173	A6981	6	100	8/31/71	F
21-11-05	299-E33-171	A6979	6	100	9/7/71	F
21-11-07	299-E33-172	A6980	6	100	8/26/71	F
21-11-10	299-E33-174	A6982	6	100	8/24/71	F
21-11-11	299-E33-175	A6983	6	100	8/20/71	F
21-12-02	299-E33-153	A6961	6	100	12/21/71	F
21-12-05	299-E33-154	A6962	6	100	12/28/71	F
21-12-07	299-E33-155	A6963	6	100	1/4/71	F
21-12-10	299-E33-156	A6964	6	100	12/30/71	F
21-12-12	299-E33-232	A7039	6	100	10/31/73	F
21-27-01	299-E33-141	A6949	6	100	6/26/70	F
21-27-02	299-E33-138	A6946	6	100	5/18/70	F
21-27-06	299-E33-139	A6947	6	100	5/22/70	F
21-27-07	299-E33-134	A6942	6	150	7/29/70	F
21-27-08	299-E33-146	A6954	6	150	8/12/70	F
21-27-09	299-E33-133	A6941	6	150	7/26/70	F
21-27-10	299-E33-132	A6940	6	150	7/24/70	F
21-27-11	299-E33-061	A6869	8	150	3/4/48	D
NA	299-E33-041	A4867	4*5	254	NA	B
NA	299-E33-136	A6944	NA	14	6/5/70	H
NA	299-E33-137	A6945	8	14	5/28/70	H
NA	299-E33-228	A7035	6	100	10/16/73	F
NA	299-E33-230	A7037	6	30	10/16/73	I/H
NA	299-E33-277	A7075	6	100	4/12/77	F

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-BX TANK FARM

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON ES051301C4	

REV NO	DESCRIPTION	CHK BY	APPD BY
1	LINE COMMENTS INCORPORATED ENGINEER RED	PRW	

REVISIONS

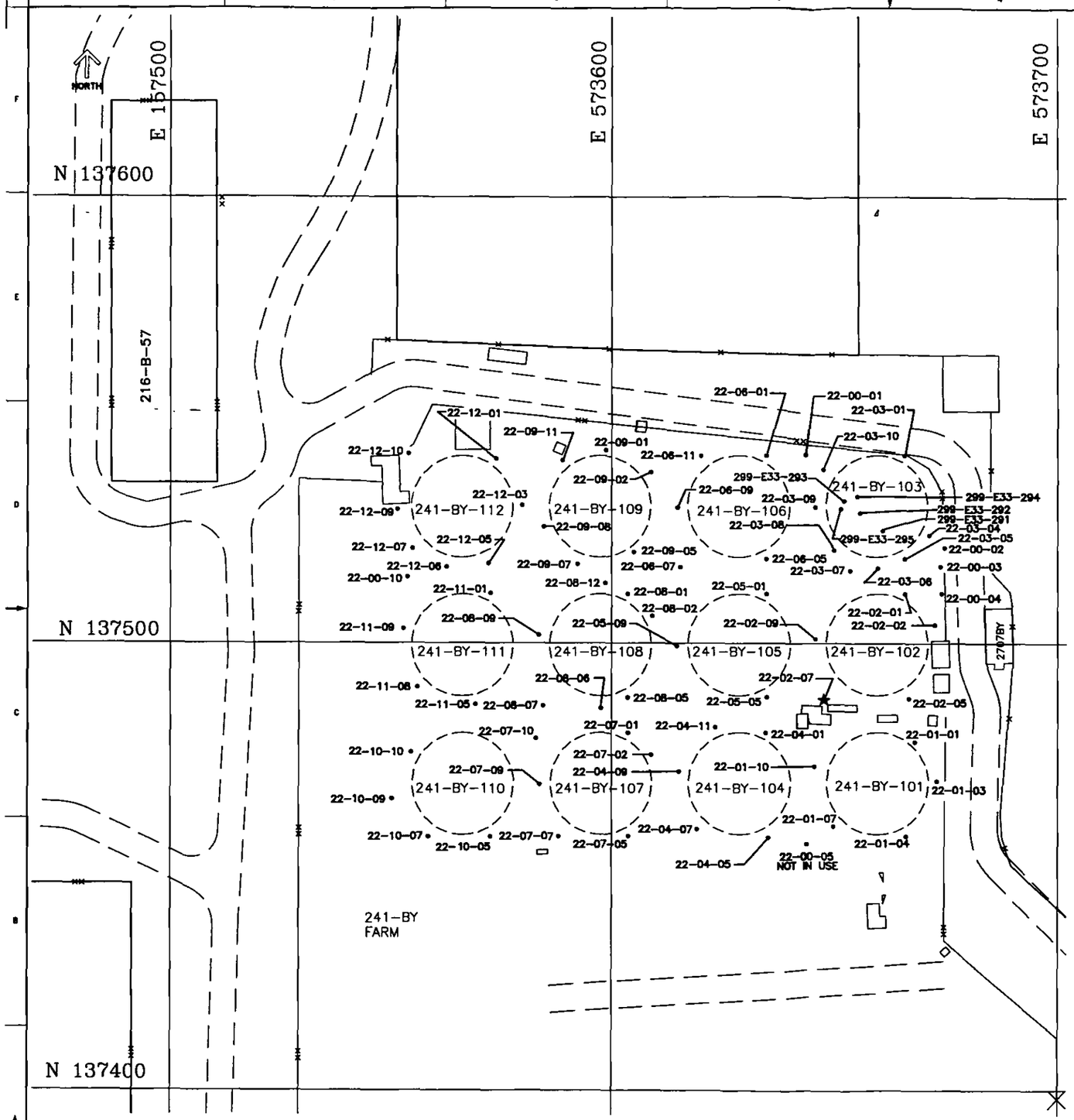
NAME	DATE
DRAWN BY BN WILLIAMS	
GADDIS	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WELLS
241-BX FARM

SIZE F | DWG NO ES-050051-C3 | REV 1

SCALE 1:200 (METERS) | SHEET 4 OF



241-BY TANK FARM

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS-- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-BY FARM WELLS

WELL NUMBER FARM#	SITE#	STATE#	Dia In	Depth ft	DATE Installed	TYPE
22-09-05	299-E33-122	A6930	6	100	02/20/70	F
22-09-07	299-E33-260	A7067	6	100	06/06/74	F
22-09-08	299-E33-121	A6929	6	100	02/17/70	F
22-09-11	299-E33-253	A7060	6	100	05/02/74	F
22-10-05	299-E33-124	A6932	6	100	08/21/70	F
22-10-07	299-E33-254	A7061	6	100	05/07/74	F
22-10-09	299-E33-255	A7062	6	100	05/03/74	F
22-10-10	299-E33-125	A6933	6	100	08/19/70	F
22-11-01	299-E33-126	A6934	6	100	08/20/70	F
22-11-05	299-E33-127	A6935	6	100	08/17/70	F
22-11-08	299-E33-256	A6864	6	151	12/31/44	C
22-11-09	299-E33-128	A6936	6	100	08/13/70	F
22-12-01	299-E33-100	A6908	6	100	11/30/67	F
22-12-03	299-E33-094	A6902	6	100	11/15/67	F
22-12-05	299-E33-095	A6903	6	100	11/22/67	F
22-12-06	299-E33-096	A6904	6	100	12/01/67	F
22-12-07	299-E33-097	A6905	6	100	11/29/67	F
22-12-09	299-E33-098	A6906	6	100	12/06/67	F
22-12-10	299-E33-099	Q6907	6	100	12/06/67	F

241-BY FARM WELLS

WELL NUMBER FARM#	SITE#	STATE#	Dia In	Depth ft	DATE Installed	TYPE
22-00-01	299-E33-085	A6893	8	150	08/02/49	D
22-00-02	299-E33-240	A7047	6	100	12/07/73	F
22-00-03	299-E33-084	A6892	8	150	07/21/49	D
22-00-04	299-E33-241	A7048	6	100	12/12/73	F
22-00-05	299-E33-083	A6891	8	150	07/11/49	D
22-00-10	299-E33-088	A6896	8	150	08/17/49	D
22-01-01	299-E33-176	A6984	6	100	12/22/71	F
22-01-03	299-E33-245	A7052	6	100	05/16/74	F
22-01-04	299-E33-177	A6985	6	100	12/26/71	F
22-01-07	299-E33-178	A6986	6	100	12/16/71	F
22-01-10	299-E33-246	A7053	6	100	05/07/74	F
22-02-01	299-E33-101	A6909	6	100	07/10/70	F
22-02-02	200-E33-227	A7034	6	100	07/27/73	F
22-02-05	299-E33-228	A7035	6	100	10/16/73	F
22-02-07	299-E33-009	A4973	4*8	275	07/21/49	B1
22-02-09	299-E33-102	A6910	6	100	09/02/70	F
22-03-01	299-E33-104	A6912	6	100	08/07/70	F
22-03-04	299-E33-211	A7018	6	100	12/05/72	F
22-03-05	299-E33-103	A6911	6	100	08/12/70	F
22-03-06	299-E33-210	A7017	6	100	12/22/72	F
22-03-07	299-E33-242	A7049	6	100	12/14/73	F
22-03-08	299-E33-244	A7051	6	100	12/06/73	F
22-03-09	299-E33-105	A6913	6	100	08/06/70	F
22-03-10	299-E33-243	A7050	6	100	12/07/73	F
	299-E33-291	A7087	2	11	04/05/88	O
	299-E33-292	A7088	2	11	04/05/88	O
	299-E33-293	A7089	2	15	04/06/88	O
	299-E33-294	A7090	2	4	04/07/88	O
	299-E33-295	A7091	2	16	04/08/88	O
22-04-01	299-E33-106	A6914	6	100	09/02/70	F
22-04-05	299-E33-107	A6915	6	100	07/21/70	F
22-04-07	299-E33-248	A7055	6	100	05/13/74	F
22-04-09	299-E33-108	A6916	6	100	08/28/70	F
	DEEPENED			125	07/12/83	F
22-04-11	299-E33-249	A7056	6	100	05/01/74	F
22-05-01	299-E33-109	A6917	6	100	07/09/70	F
22-05-05	299-E33-110	A6918	6	100	07/14/70	F
22-05-09	299-E33-111	A6919	6	100	07/27/70	F
22-06-01	299-E33-112	A6920	6	100	08/03/70	F
22-06-05	299-E33-113	A6921	6	100	07/14/70	F
22-06-07	299-E33-086	A6894	8	150	08/04/49	D
22-06-09	299-E33-114	A6922	6	100	07/30/70	F
22-06-11	299-E33-250	A7057	6	100	05/03/74	F
22-07-01	299-E33-115	A6923	6	100	08/25/70	F
22-07-02	299-E33-206	A7013	6	100	01/04/73	F
22-07-05	299-E33-116	A6924	6	100	07/23/70	F
22-07-07	229-E33-251	A7058	6	100	05/09/74	F
22-07-09	299-E33-117	A6925	6	100	08/25/70	F
22-07-10	299-E33-252	A7059	6	100	05/09/74	F
22-08-01	299-E33-118	A6926	6	100	07/22/70	F
22-08-02	299-E33-208	A7015	6	100	01/19/73	F
22-08-05	299-E33-119	A6927	6	100	07/28/70	F
22-08-06	299-E33-207	A7014	6	100	01/02/73	F
22-08-07	299-E33-087	A6895	8	150	08/15/49	D
22-08-09	299-E33-120	A6928	6	100	08/04/70	F
22-08-12	299-E33-209	A7016	6	100	01/26/73	F
22-09-01	299-E33-123	A6931	6	100	02/24/70	F
22-09-02	299-E33-259	A7066	6	100	06/10/74	F

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON ES050051C4	

REV	DESCRIPTION	BY	CHK	DATE
1	LINE COMMENTS INCORPORATE ENGINEER RED	PRW		

REVISIONS

NAME	
BJ WILLIAMS	
GADIS	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

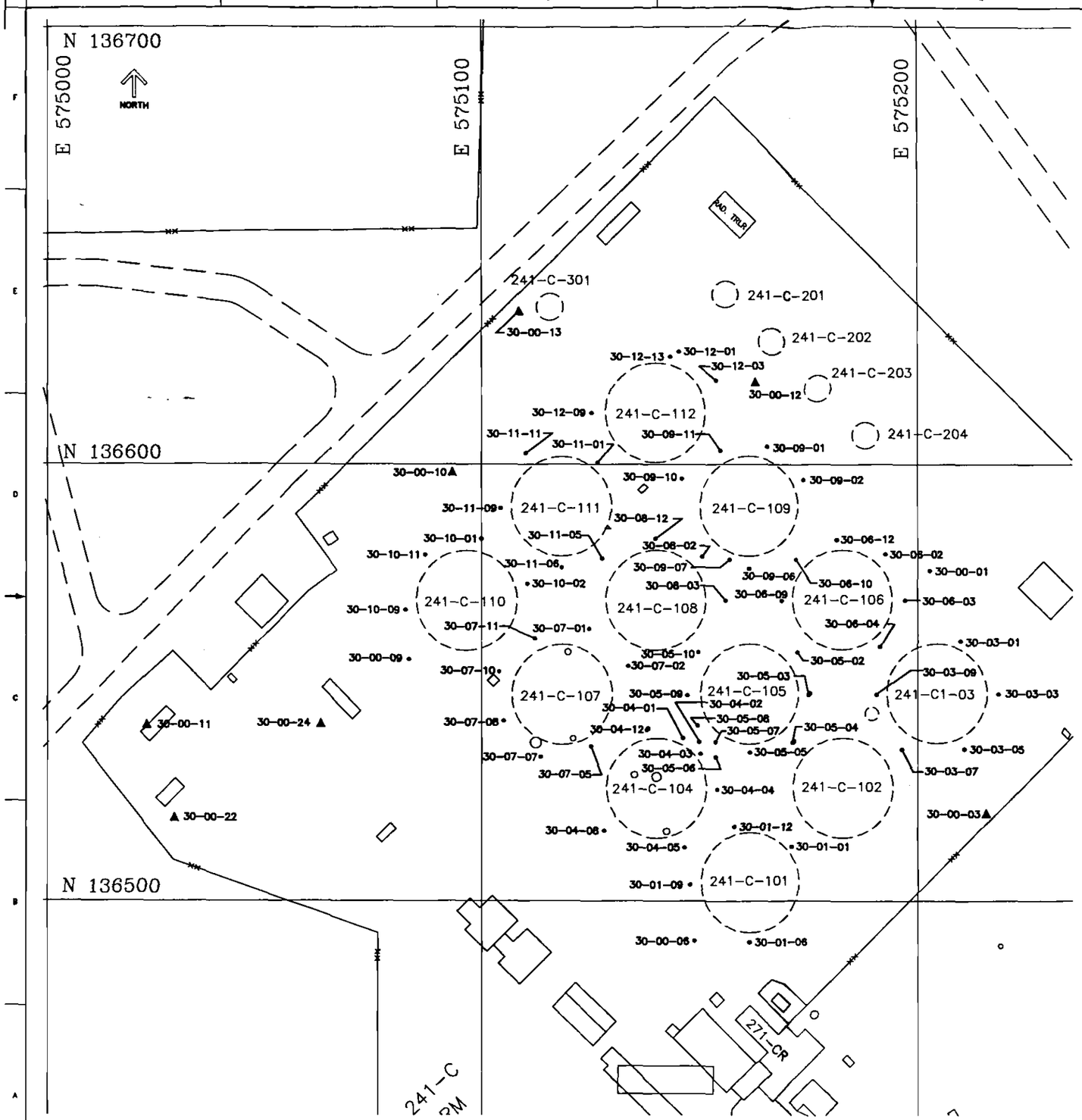
CIVIL / ENVIR
WELLS
241-BY FARM

SIZE	BLDG NO	SHEET NO	REV
F	XXXX	XXXX	1

ES-050051-C3

SCALE 1:200(METERS) XXXXXX SHEET 5 OF

RPP-5002,REV.1



241-C FARM

241-C FARM WELLS						
WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	In	ft	Installed	
30-07-08	299-E27-091	A6716	6	100	10/31/74	F
30-07-10	299-E27-092	A6717	6	100	09/06/74	F
30-07-11	299-E27-093	A6718	6	100	07/18/74	F
30-08-02	299-E27-094	A6719	6	100	09/20/74	F
30-08-03	299-E27-051	A6676	12/8	150	12/20/44	C1
30-08-12	299-E27-095	A6720	6	100	09/13/74	F
30-09-01	299-E27-096	A6721	6	100	07/29/74	F
30-09-02	299-E27-097	A6722	6	100	06/14/74	F
30-09-06	299-E27-098	A6723	6	100	09/16/74	F
30-09-07	299-E27-135	A6754	6	125	03/31/82	F
30-09-10	299-E27-099	A6724	6	100	07/17/74	F
30-09-11	299-E27-100	A6725	6	100	07/25/74	F
30-10-01	299-E27-101	A6726	6	100	09/24/74	F
30-10-02	299-E27-102	A6727	6	100	09/04/74	F
30-10-09	299-E27-103	A6728	6	100	09/30/74	F
30-10-11	299-E27-104	A6729	6	100	04/24/75	F
30-11-01	299-E27-063	A6688	6	100	02/09/70	F
30-11-05	299-E27-105	A6730	6	100	04/21/75	F
30-11-06	299-E27-064	A6689	6	100	02/25/70	F
30-11-09	299-E27-062	A6687	6	100	04/03/70	F
30-11-11	299-E27-106	A6731	6	100	04/16/75	F
30-12-01	299-E27-107	A6732	6	100	04/10/75	F
30-12-03	299-E27-108	A6733	6	100	04/07/75	F
30-12-09	299-E27-109	A6734	6	100	04/14/75	F
30-12-13	299-E27-125	A6745	6	130	04/25/78	F

241-C FARM WELLS						
WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	In	ft	Installed	
30-00-01	299-E27-056	A6681	12/8	146	12/27/44	C1
30-00-03	299-E27-054	A6679	12/8	155	01/04/45	C1
30-00-06	299-E27-055	A6680	12/10	154	12/30/44	C
30-00-09	299-E27-057	A6682	12/10	150	12/31/44	C
30-00-10	299-E27-053	A6678	12/8	150	12/14/44	C1
30-00-11	299-E27-121	A6741	6	60	03/31/77	F
30-00-12	299-E27-052	A6677	12/8	150	12/22/44	C1
30-00-13	299-E27-124	A6744	6	55	03/28/77	F
30-00-22	299-E27-120	A6740	6	55	03/18/77	F
30-00-24	299-E27-122	A6742	6	59	03/31/77	F
30-01-01	299-E27-060	A6685	6	100	03/20/70	F
30-01-06	299-E27-059	A6684	6	100	02/02/69	F
30-01-09	299-E27-058	A6683	6	100	11/08/70	F
30-01-12	299-E27-061	A6686	6	100	03/16/70	F
30-03-01	299-E27-074	A6699	6	100	06/28/74	F
	DEEPENED			125	07/06/83	F
30-03-03	299-E27-075	A6700	6	100	07/02/74	F
30-03-05	299-E27-076	A6701	6	100	07/31/74	F
30-03-07	299-E27-077	A6702	6	100	09/19/74	F
30-03-09	299-E27-078	A6703	6	100	06/25/74	F
30-04-01	299-E27-115	A6735	6	50	07/09/74	F
30-04-02	299-E27-067	A6692	6	135	12/04/72	F
30-04-03	299-E27-116	A6736	6	50	07/10/74	F
30-04-04	299-E27-079	A6704	6	100	06/19/74	F
30-04-05	299-E27-080	A6705	6	100	07/22/74	F
30-04-08	299-E27-066	A6691	6	145	11/30/72	F
30-04-12	299-E27-065	A6690	6	135	12/20/72	F
30-05-02	299-E27-070	A6695	6	130	11/20/72	F
30-05-03	299-E27-081	A6706	6	100	09/18/74	F
30-05-04	299-E27-069	A6694	6	120	12/22/72	F
30-05-05	299-E27-082	A6707	6	100	06/21/74	F
30-05-06	299-E27-119	A6739	6	60	07/30/74	F
30-05-07	299-E27-118	A6738	6	70	07/12/74	F
30-05-08	299-E27-117	A6737	6	50	07/15/74	F
30-05-09	299-E27-083	A6708	6	100	06/18/74	F
30-05-10	299-E27-068	A6693	6	135	11/27/72	F
30-06-02	299-E27-072	A6697	6	125	11/10/72	F
30-06-03	299-E27-084	A6709	6	100	06/27/74	F
30-06-04	299-E27-073	A6698	6	130	11/08/72	F
30-06-09	299-E27-085	A6710	6	100	07/08/74	F
30-06-10	299-E27-071	A6696	6	130	11/16/72	F
30-06-12	299-E27-086	A6711	6	100	08/05/74	F
30-07-01	299-E27-087	A6712	6	100	09/11/74	F
30-07-02	299-E27-088	A6713	6	100	09/10/74	F
30-07-05	299-E27-089	A6714	6	100	10/01/74	F
30-07-07	299-E27-090	A6715	6	100	10/03/74	F

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DRAWING TRACEABILITY LIST		REFERENCES	
DWG NO	TITLE	REF NUMBER	TITLE
		NEXT USED ON	

REVISIONS			
1	LINE COMMENTS INCORPORATE ENGINEER RED	PRW 4/19/96	

NAME	
BJ WILLIAMS	
GADHS	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

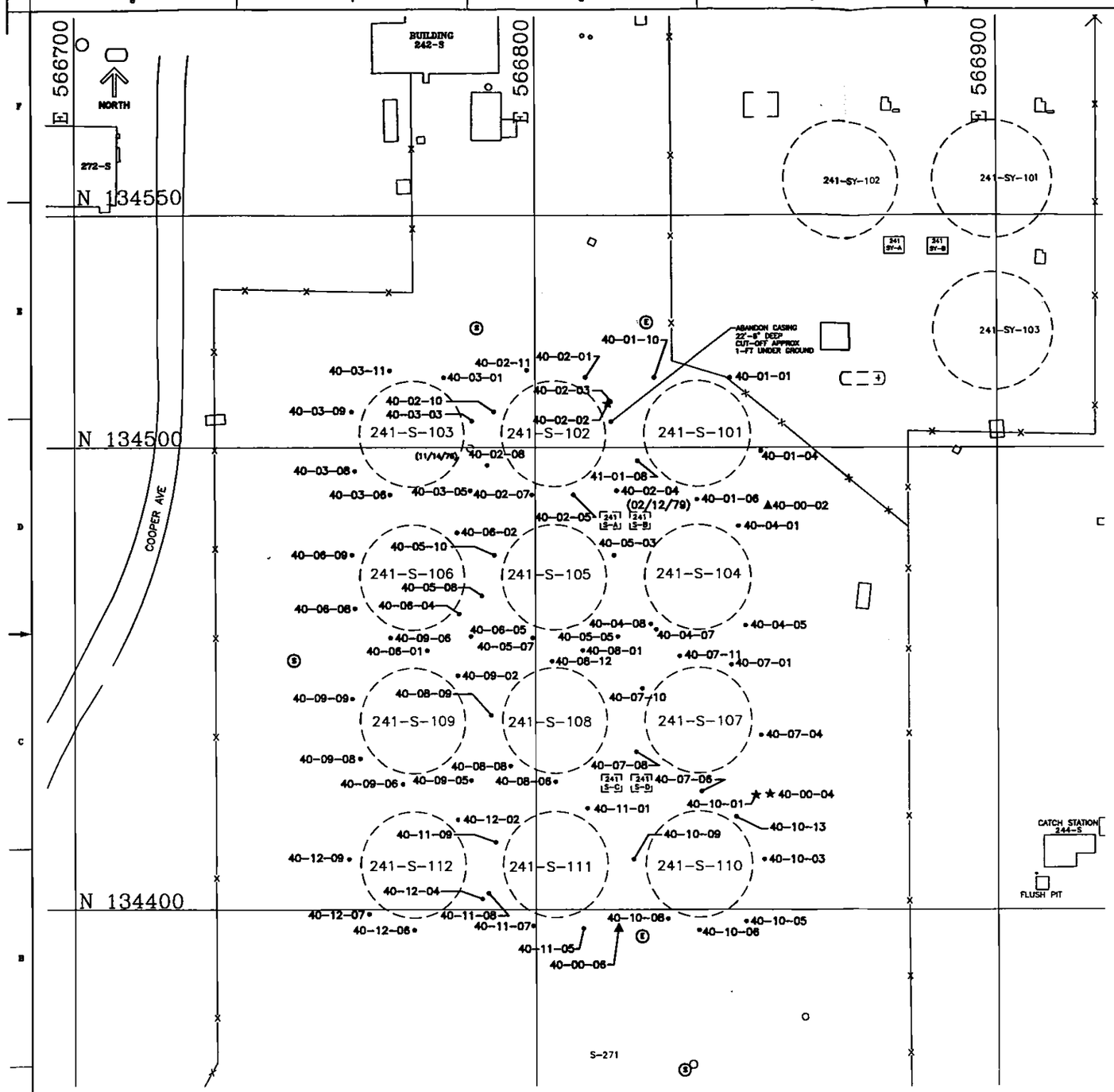
CIVIL / ENVIR
WELLS
241-C FARM

SIZE	FILE NO	SHEET NO	DWG NO	REV
F	XXXX	XXXX	ES-050051-C3	1

SCALE 1:200(METERS) XXXXXXX SHEET 6 OF

RPP-5002,REV.1

ES-050051-C3



241-S FARM WELLS

WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	in	ft	Installed	
40-10-01	299-W23-012	A4981	4*6	285	10/01/70	B1
40-10-03	299-W23-168	A8004	6	100	11/16/71	F
40-10-05	299-W23-204	A8040	6	105	03/18/76	F
40-10-06	299-W23-169	A8005	6	100	11/10/71	F
	DEEPENED			140	05/22/73	F
40-10-08	299-W23-205	A8041	6	105	03/23/76	F
40-10-09	299-W23-170	A8006	5	100	11/11/71	F
40-10-13	299-W23-218	A8049	6	130	07/01/78	F
40-11-01	299-W23-171	A8007	6	100	11/09/71	F
	DEEPENED			145	05/18/73	F
40-11-05	299-W23-206	A8042	6	105	02/27/76	F
40-11-07	299-W23-172	B2900	6	100	11/08/71	F
40-11-08	299-W23-207	A8043	6	105	03/02/76	F
40-11-09	299-W23-173	A8008	6	100	10/29/71	F
40-12-02	299-W23-174	A8009	6	100	10/28/71	F
40-12-04	299-W23-220	A8050	6	130	06/28/78	F
40-12-06	299-W23-175	A8010	6	100	11/03/71	F
	DEEPENED			145	05/18/73	F
40-12-07	299-W23-208	A8044	6	105	03/06/76	F
40-12-09	299-W23-176	A8011	6	100	11/29/71	F

241-S FARM WELLS

WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	in	ft	Installed	
40-00-02	299-W23-051	A7887	6	150	03/07/52	D
40-00-04	299-W23-001	A4979	4*6	282	06/04/52	B1
40-00-06	299-W23-056	A7892	6	150	04/25/52	D
40-01-01	299-W23-145	A7981	6	100	09/29/71	F
	DEEPENED			130	05/25/73	F
40-01-04	299-W23-179	A8015	6	100	03/05/74	F
40-01-06	299-W23-146	A7982	6	100	09/29/71	F
40-01-08	299-W23-147	A7983	6	100	10/01/71	F
40-01-10	299-W23-180	A8016	6	100	03/21/74	F
40-02-01	229-W23-148	A7984	6	100	09/01/71	F
	DEEPENED			130	05/29/73	F
40-02-02	NA	NA	6	100	02/27/74	H
40-02-03	299-W23-188	A8024	6	150	03/18/52	O
40-02-04	299-W23-052	A7888	5	144	03/01/52	F
40-02-05	299-W23-181	A8017	6	100	03/27/74	F
40-02-07	299-W23-149	A7985	6	100	09/30/71	F
40-02-08	299-W23-189	A8025	6	100	02/19/74	F
40-02-10	299-W23-150	A7986	6	100	10/04/71	F
40-02-11	299-W23-182	A8018	6	100	03/21/74	F
40-03-01	299-W23-151	A7987	6	100	10/06/71	F
40-03-03	299-W23-212	A8046	6	130	06/06/78	F
40-03-05	299-W23-053	A7889	6	150	03/01/52	D
40-03-06	299-W23-152	A7988	6	100	10/04/71	F
40-03-08	299-W23-183	A8019	6	100	03/18/74	F
40-03-09	299-W23-153	A7989	6	100	10/06/71	F
	DEEPENED			130	05/16/73	F
40-03-11	299-W23-184	A8020	6	100	03/25/74	F
40-04-01	299-W23-123	A7959	6	100	06/05/70	F
40-04-05	299-W23-124	A7960	6	100	05/28/70	F
	DEEPENED			135	05/24/73	F
40-04-07	299-W23-122	A7958	6	100	06/10/70	F
40-04-08	299-W23-177	A8013	6	50	NA	F
40-05-03	299-W23-154	A7990	6*8	100	10/14/71	F
40-05-05	299-W23-054	A7890	5	150	04/17/52	O
40-05-07	299-W23-155	A7991	6	100	10/22/71	F
40-05-08	299-W23-199	A8035	6	105	03/11/76	F
40-05-10	299-W23-156	A7992	6*8	105	04/13/71	F
40-06-02	299-W23-157	A1993	6	100	10/22/71	F
40-06-04	299-W23-213	A8047	6	130	06/01/78	F
40-06-05	299-W23-055	A7891	6	150	04/01/52	D
40-06-06	299-W23-158	A7994	6	100	11/25/71	F
40-06-08	299-W23-201	A8037	6	105	03/01/76	F
40-06-09	299-W23-159	A7995	6	100	10/25/71	F
40-07-01	299-W23-160	A7996	6	100	10/14/71	F
40-07-04	299-W23-185	A8021	6	100	03/25/74	F
40-07-06	299-W23-161	A7997	6	100	10/08/71	F
40-07-08	299-W23-186	A8022	6	100	03/27/74	F
40-07-10	299-W23-162	A7998	6	100	10/08/71	F
40-07-11	299-W23-187	A8023	6	100	04/03/74	F
40-08-01	299-W23-178	A8014	6	105	03/06/76	F
40-08-06	299-W23-163	A7999	6	100	11/04/71	F
40-08-08	299-W23-202	A8038	6	105	02/28/76	F
40-08-09	299-W23-164	A8000	6	100	10/18/71	F
40-08-12	299-W23-216	A8048	6	130	06/20/71	F
40-09-01	299-W23-200	A8036	6	105	03/15/76	F
40-09-02	299-W23-165	A8001	6	100	10/20/71	F
40-09-05	299-W23-057	A7893	6	150	04/09/52	D
40-09-06	299-W23-166	A8002	6	100	10/26/71	F
40-09-08	299-W23-203	A8039	6	100	03/11/76	F
40-09-09	299-W23-167	A8003	6	100	10/27/71	F
	DEEPENED			140	05/14/73	F

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS-- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-S TANK FARM

DWG NO	TITLE
PNL 5397	HANFORD WELLS FEBRUARY 1965
PNL 2884	HANFORD WELLS MAY 1979
BNWL 2296	HANFORD WELLS JUNE 1977
BNWL 1961	HANFORD WELLS MARCH 1976
BNWL 1739	HANFORD WELLS JUNE 1973
BNWL 928	HANFORD WELLS OCTOBER 1968
HW 44355	HANFORD WELLS JANUARY 1963

DRAWING TRACEABILITY LIST

REF NUMBER	TITLE
H-2-38943	WELLS IN 241-S FARM, AS-BUILT
H-2-38942	WELL INFORMATION, AS-BUILT 200W AREA

REFERENCES

NEXT USED ON

REV NO	DESCRIPTION	REV BY	CHK	DATE	COMPANY
1	LINE COMMENTS INCORPORATE ENGINEER RED	PRW 9/16/99			

REVISIONS

	NAME	DATE
DRAWN	BJ WILLIAMS	
ENGR	LA GADDIS	
PHYS	NA	
PROJ	NA	
QA	NA	

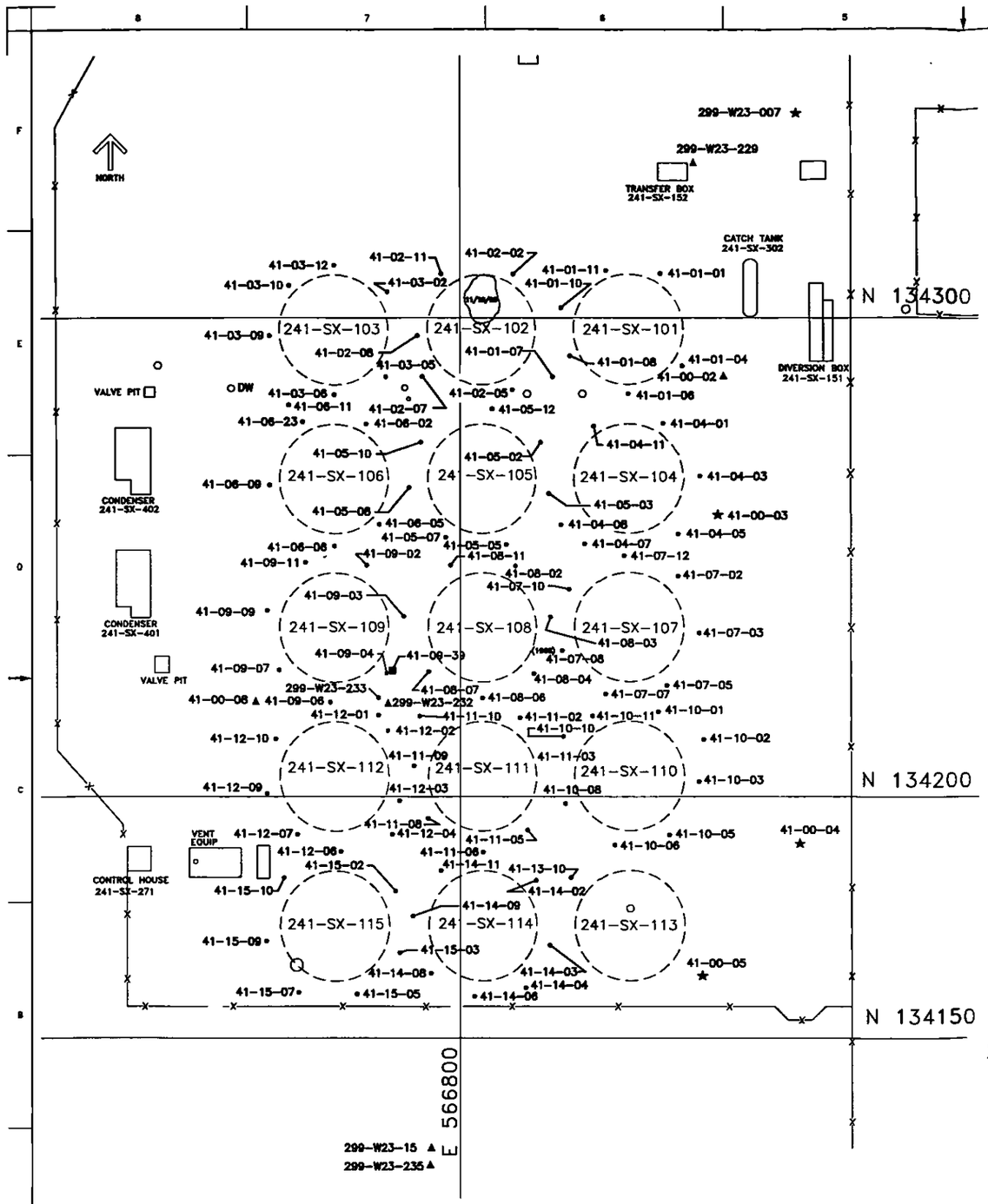
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL /ENVIR
WELLS
241-S FARM

SIZE F | CODE IDENT NO | DWG NO ES-050051-C3 | REV 1

SCALE 1:400(meters) | SHEET 7 OF

RPP-5002,REV.1



241 – SX TANK FARM

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS– NO ACTION REQD

241-SX FARM WELLS

WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	in	ft	Installed	
41-08-04	299-W23-098	A7934	7	75	03/14/62	F
41-08-06	299-W23-099	A7935	6	75	03/12/62	F
	DEEPENED			135	04/01/73	F
41-08-07	299-W23-100		6	75	03/16/62	F
41-08-11	299-W23-101	A7937	6	75	03/15/62	F
41-09-02	299-W23-110	A7946	6	75	03/23/62	F
41-09-03	299-W23-104	A7940	6	75	03/19/62	F
41-09-04	299-W23-105	A7941	6	75	03/21/62	F
	DEEPENED			105	02/01/73	F
41-09-06	299-W23-106	A7942	6	75	03/20/62	F
41-09-07	299-W23-107	A7943	6	75	03/22/62	F
41-09-09	299-W23-108	A7944	6	75	03/22/62	F
	DEEPENED			130	03/27/73	F
41-09-11	299-W23-109	A7945	6	75	03/23/62	F
41-09-39	299-W23-234	B2828	12	225	02/01/62	I
41-10-01	299-W23-080	A7916	6	75	02/23/62	F
	DEEPENED			135	04/25/73	F
41-10-02	299-W23-088	A7902	8	126	03/01/56	F1
41-10-03	299-W23-081	A7917	6	75	02/22/62	F
41-10-05	299-W23-082	A7918	6	75	02/22/62	F
41-10-06	299-W23-083	A7919	6	75	02/27/62	F
41-10-08	299-W23-084	A7920	6	75	02/27/62	F
41-10-10	299-W23-087	A7903	8	126	03/16/56	F1
41-10-11	299-W23-085	A7921	6	75	03/01/62	F
41-11-02	299-W23-096	A7932	6	75	03/14/62	F
41-11-03	299-W23-097	A7933	6	75	03/15/62	F
41-11-05	299-W23-092	A7928	6	75	03/08/62	F
	DEEPENED			135	04/19/73	F
41-11-06	299-W23-093	A7929	6	75	03/08/62	F
41-11-08	299-W23-094	A7930	8	75	03/09/62	F1
	DEEPENED			135	04/11/73	F1
41-11-09	299-W23-095	A7931	6	75	03/12/62	F
41-11-10	299-W23-064	A7900	8	125	03/07/56	F1
41-12-01	299-W23-233	B2827	7*12	126	08/12/96	F
41-12-02	299-W23-111	A7947	6	75	03/26/72	F
	DEEPENED			125	01/25/72	F
41-12-03	299-W23-112	A7948	6	75	03/26/62	F
41-12-04	299-W23-068	A7904	8	125	03/10/56	F1
41-12-06	299-W23-113	A7949	6	75	03/27/62	F
41-12-07	299-W23-114	A7950	6	75	04/04/62	F
41-12-09	299-W23-115	A7951	6	75	03/27/62	F
41-12-10	299-W23-116	A7952	6	75	03/29/62	F
41-12-1A	NA	NA	6	20.3	NA	H
41-13-10	299-W23-072	A7906	6	100	10/06/58	F
41-14-02	299-W23-091	A7927	6	75	03/09/62	F
41-14-03	299-W23-086	A7922	6	75	03/01/62	F
41-14-04	299-W23-069	A7905	8	125	03/20/56	F1
41-14-06	299-W23-087	A7923	6	75	03/02/62	F
41-14-08	299-W23-088	A7924	6	60	03/02/62	F
41-14-09	299-W23-089	A7925	6	75	03/06/62	F
41-14-11	299-W23-090	A7926	6	75	03/06/62	F
41-15-02	299-W23-117	A7953	6	75	03/29/62	F
41-15-03	299-W23-118	A7954	6	75	04/02/62	F
41-15-05	299-W23-119	A7955	6	75	03/30/62	F
41-15-07	299-W23-070	A7906	8	125	03/27/56	F1
41-15-09	299-W23-120	A7956	6	75	04/03/62	F
41-15-10	299-W23-121	A7957	6	75	04/03/62	F
	DEEPENED			125	04/30/73	F
	299-W23-007	A4990	4*6	250	11/01/69	B
	NA	B8809	NA	225	NA	B
	299-W23-232	B2826	6	21	08/12/96	A1
	299-W23-233	B2827	6	126	08/16/96	A1
(41-00-06)	299-W23-235	B2829	6	68	08/03/96	A1
	299-W23-015	A4984	4	225	12/91	A

241-SX FARM WELLS

WELL NUMBER			Dia	Depth	DATE	TYPE
FARM#	SITE#	STATE#	in	ft	Installed	
41-00-02	299-W23-061	A7897	8	102	09/23/54	E
41-00-03	299-W23-002	A4985	4*8	236	09/09/54	B1
41-00-04	299-W23-005	A4988	4*8	250	10/02/69	B1
41-00-05	299-W23-003	A4986	4*8	232	02/28/56	B1
41-00-08	299-W23-065	A7901	8	125	03/14/56	F1
41-01-01	299-W23-132	A7968	6	100	03/21/72	F1
	DEEPENED			140	05/03/73	F1
41-01-04	299-W23-190	A8026	6	100	11/01/74	F
41-01-06	299-W23-133	A7969	6	100	12/27/71	F
41-01-07	299-W23-060	Q7896	8	101	09/21/54	E
41-01-08	299-W23-134	A7970	6	100	01/03/72	F
41-01-10	299-W23-191	A8027	6*8	100	11/20/74	F
41-01-11	299-W23-192	A8028	6	100	11/18/74	F
41-02-02	299-W23-135	A7971	6	100	01/14/72	F
	DEEPENED			140	05/07/73	F
41-02-05	299-W23-223	A8051	6	130	07/31/78	F
41-02-07	299-W23-059	A7895	8	101	09/16/54	E
41-02-08	299-W23-136	A7972	6	100	01/18/72	F
41-02-11	299-W23-193	A8029	6	100	10/28/74	F
41-03-02	299-W23-194	A8030	6	100	10/30/74	F
41-03-05	299-W23-195	A8031	6	100	11/25/74	F
41-03-06	299-W23-138	A7974	6	100	02/17/72	F
41-03-09	299-W23-139	A7975	6	100	02/11/72	F
41-03-10	299-W23-196	A8032	6	100	10/25/74	F
41-03-12	299-W23-137	A7973	6	100	01/24/72	F
	DEEPENED			140	05/01/73	F
41-04-01	299-W23-140	A7976	6	100	03/15/72	F
41-04-03	299-W23-197	A8033	6	100	11/12/74	F
41-04-05	299-W23-198	A8034	6	100	11/14/74	F
41-04-07	299-W23-062	A7898	6	101	09/29/54	E
41-04-08	299-W23-225	A8052	6	130	04/04/78	F
41-04-11	299-W23-141	A7977	6	100	03/09/72	F
41-05-02	299-W23-130	A7966	6	75	02/01/62	F
	DEEPENED			130	09/20/78	F
41-05-03	299-W23-131	A7967	6	75	02/01/62	F
	DEEPENED			130	09/18/78	F
41-05-05	299-W23-125	A7961	6	75	03/30/70	F
	DEEPENED			135	04/03/73	F
41-05-07	299-W23-126	A7962	6	75	02/01/62	F
	DEEPENED			130	08/03/78	F
41-05-08	299-W23-127	A7963	6	75	02/01/62	F
	DEEPENED			130	08/30/78	F
41-05-10	299-W23-128	A7964	6	75	02/01/62	F
	DEEPENED			130	09/01/78	F
41-05-12	299-W23-129	A7965	6	75	02/01/62	F
	DEEPENED			130	09/22/78	F
41-06-02	299-W23-142	A7978	6	100	03/02/72	F
41-06-05	299-W23-143	A7979	6	100	03/21/72	F
	DEEPENED			140	03/29/73	F
41-06-06	299-W23-226	A8053	6	130	04/18/78	F
41-06-09	299-W23-144	A7980	6	100	03/24/72	F
41-06-11	299-W23-058	A7894	8	101	09/13/54	E
41-06-23	299-W23-227	A8054	6	130	05/02/78	F
41-07-02	299-W23-074	A7910	6	75	02/19/62	F
41-07-03	299-W23-075	A7911	6	75	02/20/62	F
41-07-05	299-W23-076	A7912	6	63	02/19/62	F
41-07-07	299-W23-077	A7913	6	75	02/20/62	F
41-07-08	299-W23-078	A7914	6	75	02/22/62	F
41-07-10	299-W23-079	A7915	6	75	02/23/62	F
41-07-12	299-W23-073	A7909	4*6	75	02/15/62	G1
	DEEPENED			90	09/23/78	G1
41-08-02	299-W23-102	A7938	8	75	03/16/62	F1
41-08-03	299-W23-103	A7939	6	75	03/16/62	F

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DRAWING TRACEABILITY LIST

DWG NO	TITLE
PHL 5397	HANFORD WELLS FEBRUARY 1965
PHL 2884	HANFORD WELLS MAY 1976
BNWL 2286	HANFORD WELLS JUNE 1977
BNWL 1951	HANFORD WELLS MARCH 1976
BNWL 1739	HANFORD WELLS JUNE 1973
BNWL 926	HANFORD WELLS OCTOBER 1968
HW 44359**	HANFORD WELLS JANUARY 1963

REFERENCES

REF NUMBER	TITLE
H-2-38844	WELLS IN 241-SX FARM AS-BUILT
H-2-38842	WELL INFORMATION, AS-BUILT 200W AREA
H-2-31881	241-SX TANK FARM LEAK DETECTION SYS
H-2-30890	113-SX TANK LEAK DETECTION SYSTEM

NEXT USED ON

REVISIONS

REV	DESCRIPTION	BY	DATE	CHKD
1	LINE COMMENT INCORPORATE ENGINEER RED	PRW	9/14/98	

	NAME	DATE
DRAWN	BJ WILLIAMS	
CHECKED	GADDIS	
	NA	
	NA	
	NA	
SENIOR ENGINEER		

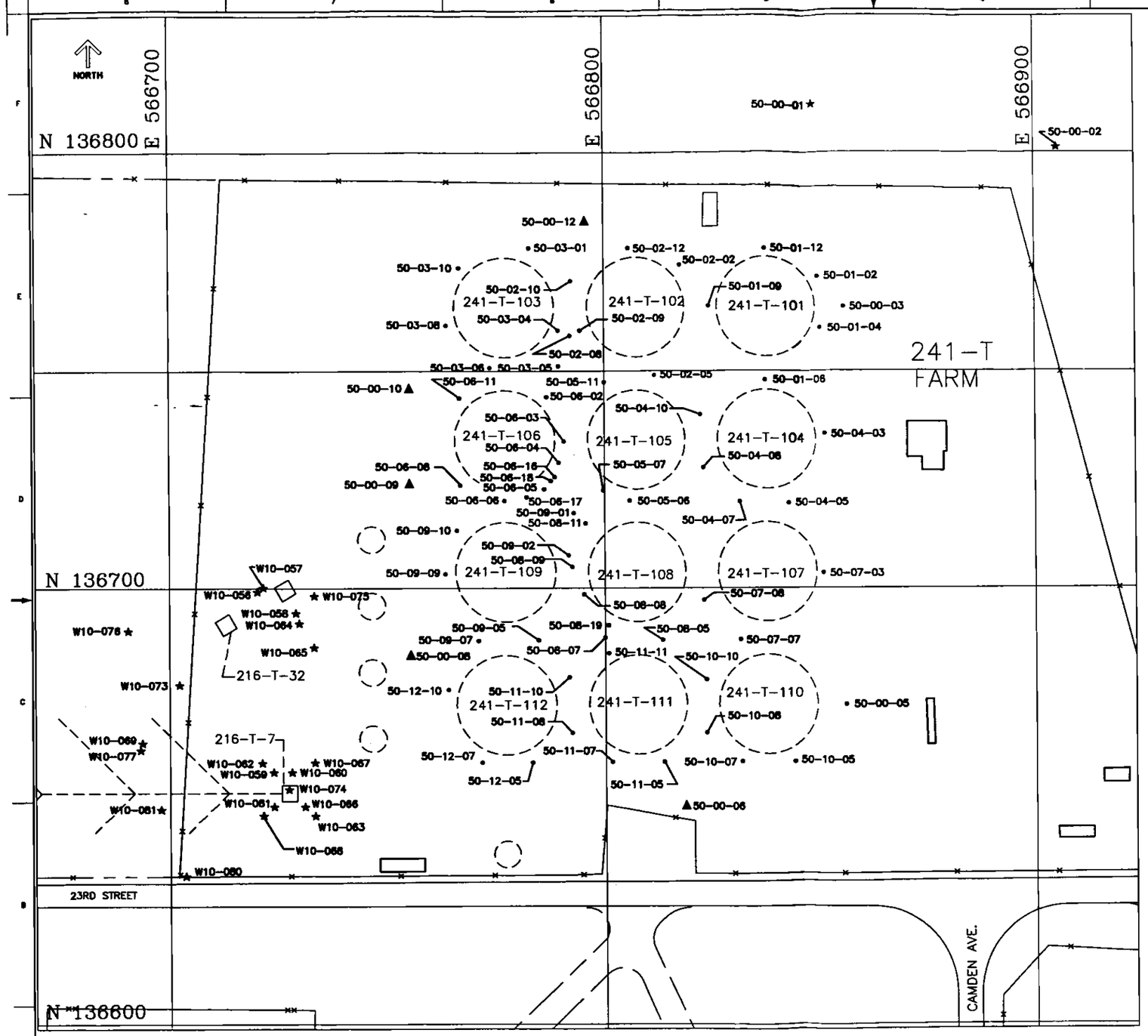
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WELLS
241-SX FARM

SIZE F | SCALE 1:400(METERS) XXX | PROJ NO XXX | DWG NO ES-050051-C3 | REV 1 | SHEET 8 OF

RPP-5002,REV.1

ES-050051-C3



241-T TANK FARM

241-T-FARM WELLS

WELL NUMBER			Dia.	Depth		
FARM #	SITE #	STATE #	in.	ft.	DATE Installed	TYPE
	Deepened			121	02/17/77	G1
216-T-32	299-W10-056	A7146	8	150	06/17/47	F1
216-T-32	299-W10-057	A7147	8	148	06/16/47	F1
216-T-32	299-W10-058	A7148	8	150	07/03/47	F1
216-T-7	299-W10-059	A7149	8	150	07/21/47	D
216-T-7	299-W10-060	A7150	8	150	07/22/47	D
216-T-7	299-W10-061	A7151	8	150	07/22/47	D
216-T-7	299-W10-062	A7152	8	150	07/30/47	F1
216-T-7	299-W10-063	A7153	8	150	07/17/47	F1
216-T-32	299-W10-064	A7154	8	75	07/11/47	F1
216-T-32	299-W10-065	A7155	8	75	08/13/47	F1
216-T-7	299-W10-066	A7156	8	125	07/15/47	D
216-T-7	299-W10-067	A7157	8	150	08/01/47	F1
216-T-7	299-W10-068	A7158	8	150	07/30/47	F1
216-T-7	299-W10-069	A7159	8	150	08/01/47	F1
216-T-7	299-W10-073	A7163	8	75	09/22/47	F1
216-T-7	299-W10-074	A7164	8	49	10/14/47	F1
216-T-32	299-W10-075	A7165	8	75	10/08/47	F1
216-T-32	299-W10-076	A7166	8	75	10/24/47	F1
216-T-7	299-W10-077	A7167	8	23	12/01/48	F1
216-T-7	299-W10-080	A7170	8	115	08/27/51	F1
216-T-7	299-W10-081	A7171	8	23	11/01/51	F1

241-T-FARM WELLS

WELL NUMBER			Dia.	Depth		
FARM #	SITE #	STATE #	in	ft	DATE Installed	TYPE
	299-W10-003	A4897	6*8	75	9/26/47	B
	Deepened			238	11/1/51	B
50-00-01	299-W10-008	A4899	6	251	06/25/73	B
50-00-02	299-W11-023	A4905	6	252	07/15/73	B
50-00-03	299-W11-051	A7291	12/10/8/6	148	09/13/44	A
50-00-05	299-W11-053	A7294	12/10/9/6	150	09/21/44	A
50-00-06	299-W10-055	A7145	5*12/6	150	09/29/44	A
50-00-08	299-W10-052	A7142	12/10/6	150	10/06/44	A
50-00-09	299-W10-168	A7251	4	122	02/15/77	F
50-00-10	299-W10-054	A7144	12/10/6	150	10/14/44	A
50-00-12	299-W10-053	A7143	12/10/6	151	10/11/44	A
50-01-02	299-W10-101	A7191	4*6	94	07/27/73	G1
50-01-04	299-W10-102	A7192	4*6	94	08/01/73	G1
	Deepened			123	03/04/81	G1
50-01-06	299-W10-103	A7193	4*5	94	08/07/73	G1
50-01-09	299-W10-104	A7194	4*5	96	08/31/73	G1
50-01-12	299-W10-105	A7195	4*5	92	07/31/73	G1
50-02-02	299-W10-122	A7212	4*5	91	02/26/74	G1
50-02-05	299-W10-123	A7213	4*5	91	03/06/74	G1
50-02-08	299-W10-116	A7206	4*5	87	07/17/73	G1
50-02-09	299-W10-119	A7209	4*5	91	08/02/73	G1
50-02-10	299-W10-124	A7214	4*5	91	03/01/74	G1
50-02-12	299-W10-125	A7215	4*5	92	02/25/74	G1
50-03-01	299-W10-126	A7216	4*5	92	02/22/74	G1
50-03-04	299-W10-118	A7208	4*5	87	07/30/73	G1
	Deepened			123	04/05/81	G1
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	Deepened			123	03/30/81	G1
50-03-06	299-W10-145	A7235	4*5	99	01/15/75	G1
	Deepened			125	03/28/77	G1
50-03-08	299-W10-127	A7217	4*5	91	02/20/74	G1
50-03-10	299-W10-128	A7218	4*5	93	02/14/74	G1
50-04-03	299-W10-146	A7236	4*5	92	02/14/75	G1
50-04-05	299-W10-129	A7219	4*5	94	03/06/74	G1
50-04-07	299-W10-147	A7237	4*5	100	02/03/75	G1
50-04-08	299-W10-148	A7238	4*5	100	01/22/75	G1
50-04-10	299-W10-130	A7220	4*5	93	03/07/74	G1
50-05-06	299-W10-113	A7203	4*5	87	07/20/73	G1
	Deepened			122	05/12/77	G1
50-05-07	299-W10-165	A7248	10/8/6	91	08/08/75	A1
50-05-11	299-W10-121	A7211	4*8	92	08/16/73	G1
	Deepened			123	03/24/81	G1
50-06-02	299-W10-108	A7198	4*5	92	07/07/73	G1
	Deepened			125	05/19/77	G1
50-06-03	299-W10-107	A7197	4*5	100	06/27/73	G1
	Deepened			122	03/25/77	G1
50-06-04	299-W10-110	A7200	6	93	7/19/73	F
50-06-05	299-W10-111	A7201	4*5	94	08/23/73	G1
	Deepened			122	06/09/77	G1
50-06-06	299-W10-106	A7196	4*5	100	07/03/73	G1
	Deepened			123	03/18/77	G1
50-06-08	299-W10-109	A7199	4*5	92	07/10/73	G1
	Deepened			123	03/04/77	G1
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50-06-17	299-W10-162	A7246	10/6	91	07/10/75	F
50-06-18	299-W10-196	A7274	10/8/6	176	04/13/93	A
50-07-03	299-W10-149	A7239	4*5	92	03/10/75	G1
50-07-07	299-W10-142	A7232	4*5	94	03/14/74	G1
50-07-08	299-W10-150	A7240	4*5	94	02/25/75	G1
50-08-05	299-W10-143	A7233	4*5	94	03/18/74	G1
50-08-07	299-W10-133	A7223	4*5	94	02/28/74	G1
	Deepened			120	03/12/81	G1
50-08-08	299-W10-178	A7255	6	103	04/25/78	F
50-08-09	299-W10-112	A7202	4*5	87	07/15/73	G1
	Deepened			121	04/01/77	G1
50-08-11	299-W10-051	A7141	6	150	10/05/44	F
50-08-19	299-W10-178	A7257	6	95	08/02/79	F
50-09-01	299-W10-164	A7247	6	150	09/30/75	F
50-09-02	299-W10-166	A7249	8*6	122	06/30/75	F
50-09-05	299-W10-134	A7224	4*5	94	03/13/74	G1
50-09-07	299-W10-144	A7234	4*5	94	03/15/74	G1
50-09-09	299-W10-120	A7210	4*5	121	05/05/77	G1
50-09-10	299-W10-114	A7204	4*5	121	07/25/73	G1
50-10-05	299-W10-135	A7225	4*5	95	02/19/74	G1
50-10-07	299-W10-136	A7226	4*5	94	02/14/74	G1
50-10-08	299-W10-151	A7241	4*5	93	03/04/75	G1
50-10-10	299-W10-137	A7227	4*5	94	02/21/74	G1
50-11-05	299-W10-138	A7228	4*5	93	02/12/74	G1
50-11-07	299-W10-152	A7242	4*5	94	02/27/75	G1
50-11-08	299-W10-139	A7229	4*5	94	02/25/74	G1
50-11-10	299-W10-153	A7243	4*5	100	01/08/75	G1
50-11-11	299-W10-177	A7256	8*6	92	07/26/79	F
50-12-05	299-W10-154	A7244	4*5	100	01/02/75	G1
50-12-07	299-W10-140	A7230	4*5	94	03/05/74	G1
50-12-10	299-W10-141	A7231	4*5	94	03/01/74	G1

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- ● PRIORITY 3 WELLS
- ⊠ DECOMMISSION WELLS– NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

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REF NUMBER	TITLE
REFERENCES	
NEXT USED ON ES-E050051-C7-1	

REV NO	DESCRIPTION	REV BY	DATE
1	LINE COMMENTS INCORPORATED ENGINEER RED	PRW	1/19/99

REVISIONS

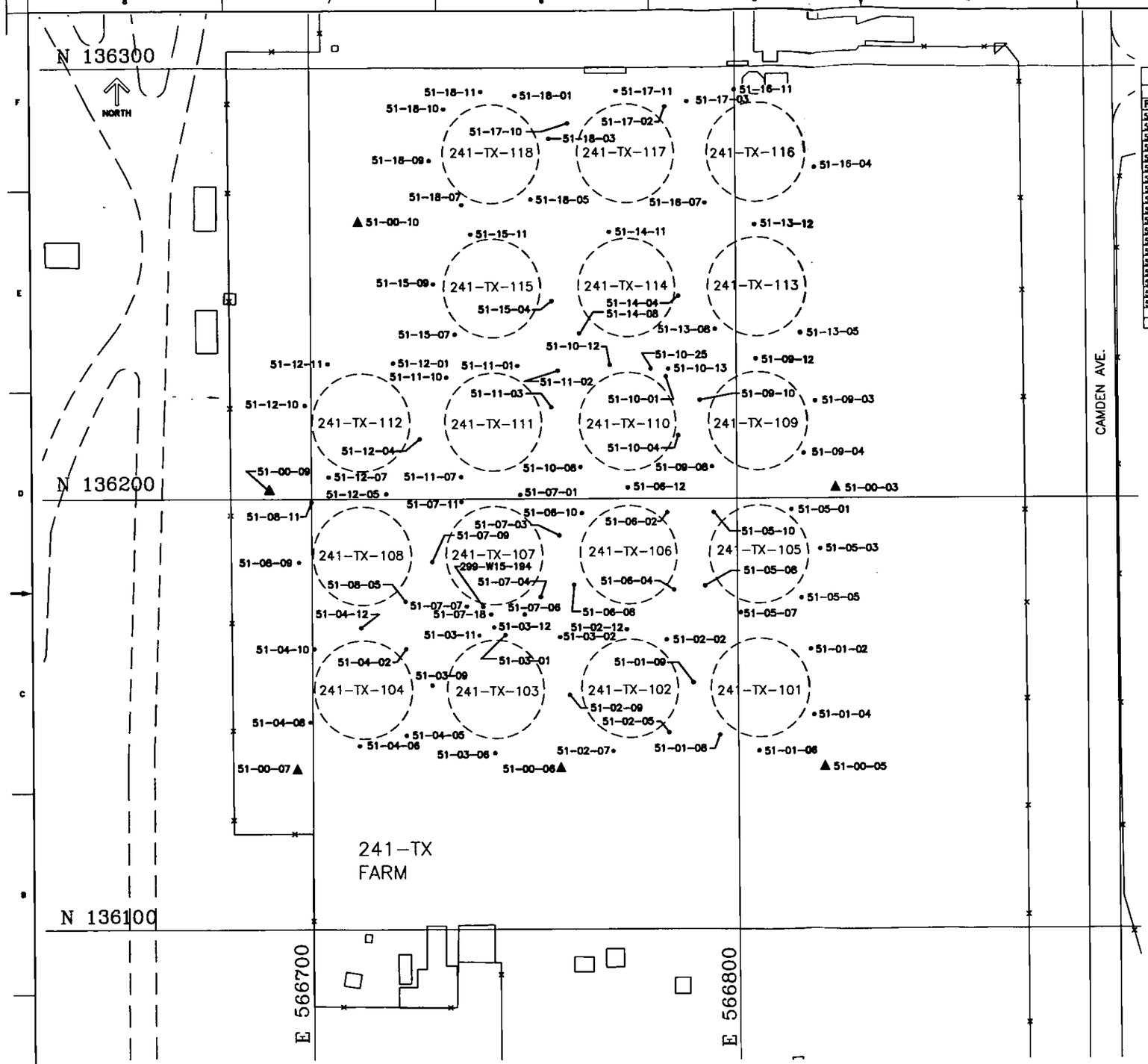
NAME	DATE
BJ WILLIAMS	1-19-99
GADDIS	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL / ENVIR
WELLS
241-T FARM

SIZE F | DWG NO ES-050051-C3 | REV 1

SCALE 1:200 METERS | SHEET 9 OF



241-TX TANK FARM

241-TX-FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	installed	
51-14-11	299-W15-117	A7416	6	100	09/27/70	F
51-15-04	299-W15-118	A7417	6	100	03/09/70	F
51-15-07	299-W15-119	A7418	6	95	03/03/70	F
51-15-09	299-W15-160	A7458	6	100	12/04/73	F
51-15-11	299-W15-120	A7419	6	100	03/11/70	F
51-16-04	299-W15-161	A7459	6	100	11/29/73	F
51-16-07	299-W15-163	A7461	6	100	12/04/73	F
51-16-11	299-W15-162	A7460	6	100	11/21/73	F
51-17-02	299-W15-121	A7420	6	100	10/15/70	F
51-17-03	299-W15-058	A7369	8	150	01/28/49	F1
51-17-10	299-W15-122	A7421	6	100	10/07/70	F
51-17-11	299-W15-164	A7462	6	100	10/30/73	F
51-18-01	299-W15-181	A7479	6	100	04/29/74	F
51-18-03	299-W15-123	A7422	6	100	10/20/70	F
51-18-05	299-W15-182	A7480	6	100	04/30/74	F
51-18-07	299-W15-124	A7423	6	100	09/08/70	F
51-18-09	299-W15-183	A7481	6	100	04/08/74	F
51-18-10	299-W15-125	A7424	6	100	11/02/70	F
51-18-11	299-W15-165	A7463	6	100	11/16/73	F
NA	299-W15-151	A7450	NA	25	02/06/73	L
NA	299-W15-194	A7492	6*8	48	07/07/77	F

241-TX-FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	installed	
51-00-03	299-W15-067	A7368	8	150	01/27/49	D
51-00-05	299-W15-070	A7371	8	150	01/31/49	D
51-00-06	299-W15-069	A7370	8	150	02/09/49	D
51-00-07	299-W15-073	A7374	8	150	03/04/49	D
51-00-09	299-W15-074	A7375	8	150	03/03/49	D
51-00-10	299-W15-075	A7376	8	150	03/04/49	D
51-01-02	299-W15-166	A7464	6	112	01/22/74	F
51-01-04	299-W15-167	A7465	6	115	12/21/73	F
51-01-06	299-W15-168	A7466	6	100	04/19/74	F
51-01-08	299-W15-169	A7467	6	100	04/18/74	F
51-01-09	299-W15-155	A7453	6	43	12/18/73	F
51-02-02	299-W15-170	A7468	6	100	04/23/74	F
51-02-05	299-W15-143	A7442	6	100	07/21/71	F
51-02-07	299-W15-172	A7470	6	100	04/16/74	F
51-02-09	299-W15-142	A7441	6	100	07/08/71	F
51-02-12	299-W15-141	A7440	6	100	07/15/71	F
51-03-01	299-W15-192	A4923	6	105	06/01/77	F
51-03-02	299-W15-071	A7372	8	150	02/08/49	D
51-03-06	299-W15-127	A7426	6	100	11/10/71	F
51-03-09	299-W15-128	A7427	6	100	11/08/71	F
51-03-11	299-W15-191	A7489	6*8	105	05/27/71	F
51-03-12	299-W15-126	A7425	6	100	11/02/71	F
51-04-02	299-W15-153	A7451	6	105	04/05/76	F
51-04-05	299-W15-130	A7429	6	100	11/12/71	F
51-04-06	299-W15-154	A7452	6*8	105	04/05/76	F
51-04-08	299-W15-131	A7430	6	100	11/12/71	F
51-04-10	299-W15-156	A7454	6*8	105	04/13/76	F
51-04-12	299-W15-129	A7428	6	100	11/23/71	F
51-05-01	299-W15-173	A7471	6	100	03/29/74	F
51-05-03	299-W15-174	A7472	6	115	01/28/74	F
51-05-05	299-W15-145	A7444	6	100	06/04/71	F
51-05-07	299-W15-171	A7469	6	111	01/17/74	F
51-05-08	299-W15-146	A7445	6	100	06/17/71	F
51-05-10	299-W15-144	A7443	6	100	06/23/71	F
51-06-02	299-W15-148	A7447	6	100	08/25/71	F
51-06-04	299-W15-149	A7448	6	100	07/14/71	F
51-06-06	299-W15-175	A7473	6	100	04/11/74	F
51-06-10	299-W15-147	A7446	6	100	07/01/71	F
51-06-12	299-W15-158	A7456	6*8	100	04/01/76	F
51-07-01	299-W15-178	A7476	6	110	01/23/74	F
51-07-03	299-W15-187	A7484	6	105	05/29/76	F
51-07-04	299-W15-133	A7432	6	100	12/01/71	F
51-07-06	299-W15-193	A7491	6	55	07/01/77	F
51-07-07	299-W15-190	A7488	6	105	05/16/77	F
51-07-09	299-W15-134	A7433	6	100	11/18/71	F
51-07-11	299-W15-132	A7431	6	100	11/29/71	F
51-07-18	299-W15-195	A7493	6	105	07/01/77	F
51-08-05	299-W15-136	A7435	6	101	11/16/71	F
51-08-09	299-W15-137	A7436	6	100	11/16/71	F
51-08-11	299-W15-135	A7434	6	100	11/18/71	F
51-09-03	299-W15-139	A7438	6	100	10/27/71	F
51-09-04	299-W15-188	A7485	6	105	04/13/76	F
51-09-08	299-W15-140	A7439	6	100	10/22/71	F
51-09-10	299-W15-189	A7486	6	105	04/01/76	F
51-09-12	299-W15-138	A7437	6	85	10/18/71	F
51-10-01	299-W15-176	A7474	6	100	04/10/74	F
51-10-04	299-W15-103	A7402	6	100	09/15/70	F
51-10-08	299-W15-104	A7403	6	100	09/24/70	F
51-10-12	299-W15-105	A7404	6	100	09/01/70	F
51-10-13	299-W15-196	A7494	6	105	09/22/77	F
51-10-25	299-W15-197	A7495	6	108	03/28/78	F
51-11-01	299-W15-177	A7475	6	113	04/24/74	F
51-11-02	299-W15-072	A7373	8	150	02/08/49	C1
51-11-03	299-W15-106	A7405	6	100	10/02/70	F
51-11-07	299-W15-107	A7406	6	100	09/25/70	F
51-11-10	299-W15-108	A7407	6	100	10/02/70	F
51-12-01	299-W15-159	A7457	6	100	11/20/73	F
51-12-04	299-W15-109	A7408	6	100	09/22/70	F
51-12-05	299-W15-179	A7477	6	100	04/26/74	F
51-12-07	299-W15-110	A7409	6	100	10/02/70	F
51-12-10	299-W15-180	A7478	6	100	04/30/74	F
51-12-11	299-W15-111	A7410	6	100	09/25/70	F
51-13-05	299-W15-112	A7411	6	100	10/13/70	F
51-13-08	299-W15-113	A7412	6	100	09/16/70	F
51-13-12	299-W15-114	A7413	6	100	10/09/70	F
51-14-04	299-W15-115	A7414	6	100	09/14/70	F
51-14-08	299-W15-116	A7415	6	100	09/22/70	F

SYMBOL LEGEND

★ PRIORITY 1 WELLS

▲ PRIORITY 2 WELLS

● PRIORITY 3 WELLS

☒ DECOMMISSION WELLS- NO ACTION REQD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

DRAWING TRACEABILITY LIST			
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REVISIONS			
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1	LINE COMMENTS INCORPORATED ENGINEER REQ	PRW 3/14/00	

NAME	DATE
BJ WILLIAMS	11-13-98
GADDIS	

U.S. DEPARTMENT OF ENERGY
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241-TX

SIZE F | DRAWING NO ES-050051-C3 | REV 1

SCALE 1:200 (METERS) | SHEET 10 OF

ES-050051-C3 REV 1

ATTACHMENT III

SURFACE WATER ASSESSMENT

ENGINEERING STUDY

ATTACHMENT III

SURFACE WATER CONTROL FOR SINGLE-SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

March 2001

Subcontract LMHC 96WO-0006

Prepared by

Fluor Federal Services
Richland, Washington

Prepared for

CH2M HILL Hanford Group, Inc.

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APPENDICES

Appendix A. Decision Matrix

Appendix B. Cost Estimates

Appendix C. Photos

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SURFACE WATER CONTROL FOR SINGLE-SHELL TANK FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE

1.0 INTRODUCTION

Operation activities within Hanford Site single-shell tanks (SST) farms have contributed to contamination of the soil above, around, and below the SSTs. Studies have shown that water added to the soil column contributes to the migration of contamination through the vadose zone into the groundwater (Gee 1992, 1994, 1998, and Tyler 1999).

This engineering study identifies and evaluates alternatives for surface water control within and onto the SST farms in the 200-East and 200-West Areas (see Figure 1). The source of surface water includes normal precipitation, pressurized water line ruptures, rapid snowmelt, or the accidental dumping of water via a truck. This study, in conjunction with two related studies on the evaluation of the water lines and monitoring wells within the SST farms, will provide a basis for interim remedial action to substantially reduce water infiltration into the soils and control contamination migration through the vadose zone. These combined studies support completion of Tri-Party Agreement (TPA) milestone P (M)-45-56-T01 as created by draft change request M-45-98-03.

2.0 SUMMARY AND CONCLUSIONS

This assessment reviewed the extent of the water accumulation on the SST surfaces and provides alternatives to reduce or eliminate infiltration on the farms. The initial phase of the engineering study determined the existing physical conditions in and around the tank farms. This was completed through discussions with tank farm operations personnel and walkdowns performed in each of the 12 tank farms.

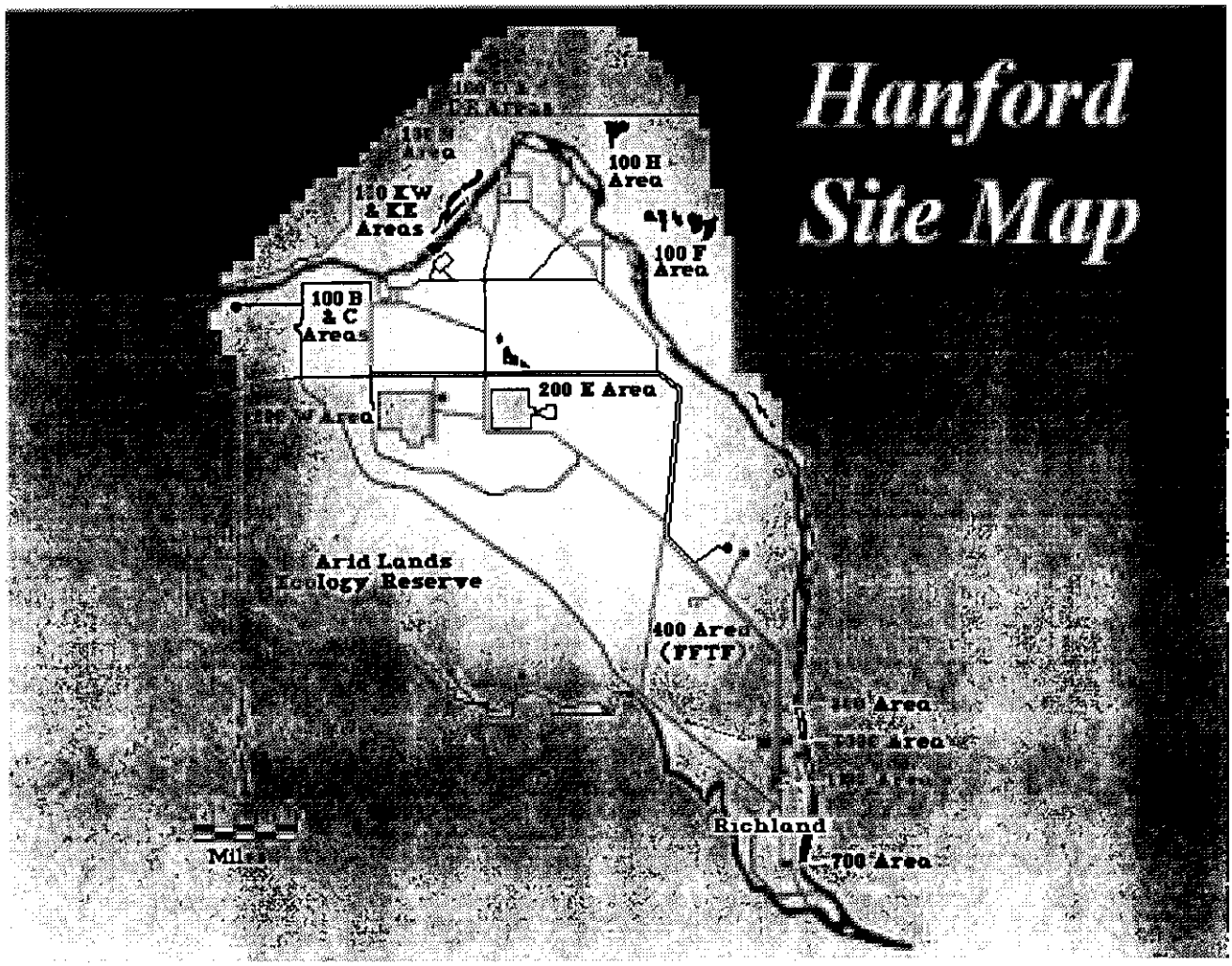

Figure 1, **HANFORD SITE MAP**

Three factors that contribute to the water accumulation and infiltration conditions include: (1) Surface water run-on from adjacent areas; (2) Variations in the tank farm surface contours, including obstructions on and adjacent to the tank farms; and (3) The highly porous, rocky and sandy soil on the tank farm surface that allows immediate infiltration.

The following alternatives were evaluated:

- Alternative 1: No Action (not a viable option)

- Alternative 2: Site Grading
- Alternative 3: Geo-fabric Liner
- Alternative 4: Asphalt Concrete Paving
- Alternative 5: Building Enclosure
- Alternative 6: Run-on Control

The best technical and operational alternative consists of a combination of Alternatives 5 and 6. Alternative 5 would provide a prefabricated structure to enclose the surface area of each tank farm. (Note: This is not the preferred alternative; the reason is provided later). The foundation or anchorage system for the structure would be located a minimum of 10 meters (165 feet) away from the edge of the tanks to minimize interference with underground facilities and dome-loading effects. In conjunction with the building, an asphalt concrete paved apron would be installed and extend from the building to the outer boundary of the surface water control area of the farms. The combination of the building and apron would collect precipitation in the farm and direct the flow in a controlled manner, away from the tank farm area. Alternative 6 would provide run-on prevention at all tank farms by installing berms, lined ditches, curbs, or a combination of these, to divert potential run-on away from the tank farms.

Alternative 5 was determined to be the most costly of the alternatives considered. This approach provides the best technical and operational solution because it would eliminate infiltration from precipitation and run-on. The building, with the appropriate options, would provide the flexibility to allow continuous operations, maintenance, interim stabilization, and retrieval activities to be performed regardless of weather conditions over a minimum 25-year period. Optimization of building and foundation types in the conceptual design phase, coupled with a graded approach for implementation, can reduce the overall cost of Alternative 5.

Alternative 6, run-on control, is one of the recommendations for the surface water control. Combined with the recommendations contained in the water line assessment study (Attachment I) and the well assessment study (Attachment II), and Alternative 5, building enclosure, it would eliminate infiltration into the vadose zone and minimize risk to groundwater.

Although a building enclosure is the best operational and technical alternative to minimize surface water infiltration at the tank farms, due to economic concerns, it is not the preferred alternative. Table III-6.4-1 lists the rough order of magnitude (ROM) cost for the building enclosures (Alternative 5) at $200 million. Alternatives 3 and 4 (geo-fabric liner and asphalt pavement, respectively) provide a substantial reduction in infiltration into the vadose zone. When the marginal decrease in risk is compared to the substantial increase in cost (approximately $159 million), the cost-to-benefit ratio is so high that it is evident that Alternative 5 is not a practical recommendation when compared to Alternatives 3 and 4.

Following installation of run-on control barriers (Alternative 6), as part of a RCRA Corrective Measure Study (CMS), a risk analysis should be performed to assist in determining which type of surface barrier to install, if any. When the relative low precipitation in the area and other considerations are analyzed, an appropriate decision can be made. Such an analysis could lead to the selection of run-on control barriers (Alternative 6) as the sole alternative to minimize surface water infiltration at the tank farms.

3.0 APPROACH/EVALUATION

Various investigations were conducted to determine the best possible solution for controlling surface water run-on to and off the SST farms. Each SST farm was observed to identify any ponding or depression areas. Lockheed Martin Hanford Corporation (LMHC) and CH2M HILL Hanford Group, Inc. (CHG) operations and engineering personnel identified known problems or ponding areas and provided sketches or documentation of problem areas. Current aerial photos of the farms were reviewed to help identify ponding areas, see Appendix C.

Sketches were prepared for each SST farm and the surrounding area. These sketches show the general layout and physical features (fences, buildings, tanks, etc.) of each tank farm. The sketches also show existing ground contours in and adjacent to the farms. The sketches were developed using the CAMIS mapping system and the contours were developed from 1996 aerial photogrammetry obtained from Bechtel Hanford Incorporated (BHI).

Appendix D contains sketches that show each general cluster of tank farms. Each farm is shown in greater detail on respective sheets. The cluster sketches show the general slope of the terrain around the farms and help establish the best location for berms or dikes to control surface water run-on to the farms. The farm sketches show specific details that help determine local areas of ponding, the general slope of the ground within the farm, and the various obstructions that could be detrimental to installation of liners, covers, or buildings.

4.0 DECISION CRITERIA

The decision criteria are used to distinguish between the alternatives and represent a mixture of quantitative and qualitative factors. These criteria have been established to evaluate the potential advantages and disadvantages associated with implementing a given alternative. Some of the criteria, such as cost, represent directly measurable variables while other criteria, such as operability, are dependent on the judgement of technical experts and experienced engineers. The criteria are not all-inclusive, or detailed in scope. They represent a wide range of safety, social, and economic issues that permit the screening of potential alternative technologies for acceptability. The alternatives will be analyzed to select those deemed to have the greatest possibility for successful implementation.

4.1 SAFETY AND HEALTH

Public and worker safety and health is of prime concern and a positive and active effort must be included in all work to reduce hazards to a minimum consistent with accepted practices and regulatory requirements. CHG's "Safe Project Delivery" program implemented in August 2000, supports the emphasis on safety issues as a decision criterion.

4.1.1 Public Safety

Protection of the general public from Hanford Site hazards is of paramount importance and any safety problem with an impact beyond the confines of the controlled portion of the site is considered a public safety issue.

4.1.1.1 Radiation Releases. Releases where radioactivity is the principal hazard

a. Chronic releases: Small continual releases associated with normal operation.

b. Accidental releases: Unplanned releases due to equipment malfunction or operator error.

4.1.1.2 Nonradioactive Releases. Releases with radiation below the allowable limits where the principal hazard is chemical compounds.

4.1.2 Worker Safety

Worker safety is a critical aspect of all jobs and must receive careful consideration. Worker safety pertains to individuals working directly with the equipment or in adjacent areas including all personnel within the confines of the controlled portion of the Hanford Site.

4.1.2.1 Radiation Exposure

a. Chronic exposure: Exposure associated with day-to-day operation and maintenance. This type of exposure should be minimized by implementation of the ALARA program. Contact operation and maintenance of radioactive equipment should be avoided where possible and remote techniques should be utilized.

b. Accidental exposure: Unplanned exposure due to equipment malfunction or operator error. Applying engineering controls and radiation barriers should minimize these exposures.

4.1.2.2 Chemical Exposure. The exposure to hazardous chemicals should be eliminated where possible, and where not possible, should be reduced to acceptable regulatory standards.

4.1.2.3 Industrial Safety. Industrial safety is the consideration of normal construction hazards such as tripping, falling, improper use of tools, working in proximity to heavy equipment, electrical shock, etc. Industrial safety includes most hazards normally associated with construction, maintenance and operation of plant facilities, and equipment.

4.1.3 Environmental Safety

Environmental safety is the evaluation of the alternatives versus how the construction, operation, and maintenance could affect the environment.

4.1.3.1 Protection of the Biota. Protection of the flora (plant life) and fauna (animal life).

4.1.3.2 Groundwater Protection. Construction, operation, or maintenance activities that produce any hazardous liquid or material that constitute a threat to groundwater if it is not properly controlled. This could include unplanned releases due to equipment malfunction or operator error.

4.1.3.2 Atmospheric Protection. Construction, operation, or maintenance activities of the alternative that release hazardous gases or volatile liquid. Will the activity contribute substantially to blowing dust possibly carrying radionuclide that could affect air quality? Will the alternative generate releases associated with the day-to-day operation and maintenance or unplanned releases due to equipment malfunction or operator error?

4.2 REGULATORY COMPLIANCE

All work and equipment shall comply with applicable U. S. Department of Energy (DOE) orders, Washington State statutes, and Environmental Protection Agency (EPA) regulations. The regulatory compliance decision criteria include consideration of regulatory compliance, permitting, and complexity issues. Permitting requirements should be evaluated based on the following factors: (1) number of permits required or modified, (2) complexity of required permitting documentation, (3) potentially required permits or approvals that are unique to the system being examined, (4) regulatory obstacles, and (5) impacts of permitting activities on the project schedule.

4.3 LIFE-CYCLE COST

To the extent practical, the system, equipment, or components will be evaluated with respect to capital, operating, and decontamination/decommissioning life-cycle costs.

4.3.1 Capital Cost

Includes all costs for design, construction, and incidentals for the facility or equipment.

4.3.2 Operating Cost

Includes normal costs associated with the day-to-day operation and maintenance of equipment or facility.

4.3.3 Decontamination and Demolition

All costs for final cleanup, demolition, and disposal of equipment or facility.

4.4 TANK INTEGRITY

The SSTs have exceeded their original design life and information on the physical condition of the tank structures is limited. Potential structural integrity concerns and impacts associated with SST waste storage and removal operation could influence the selection of the preferred alternative.

4.5 FUTURE RETRIEVAL AND PROCESSING

The potential impact on future retrieval, transport, storage, and waste processing operations should be evaluated for each alternative. Actions that may potentially compromise, severely impact, or complicate these activities should be identified and described.

Existing and planned waste retrieval from the SSTs are principally designed to handle and transfer liquids. Waste retrieval involves sluicing or mixing present solids with liquids to permit the transfer of the liquid and slurry via pumps through existing and planned transfer lines to storage and process facilities. Installation of this equipment should not be restricted.

It is possible that contaminated soils associated with the SSTs may need to be removed or treated. The alternatives considered should be evaluated as to their potential to limit this activity.

4.6 SCHEDULE

Alternatives should be evaluated with respect to whether they could impact other TPA milestones and if the alternative can be constructed in a timely manner.

4.7 PROVEN TECHNOLOGY

The technical maturity of a process, system, or product can affect its performance. The overall performance of a product could be a factor of the complexity of construction. The demonstration of operational readiness within established schedule constraints could be considered a function of technical maturity. Maturity can also be expressed in terms of the hierarchy, shown in Table 4-I.

Table 4-1

TECHNOLOGY MATURITY

PHASE	DESCRIPTION OF ACTIVITIES
Available	Technologies that are applied on a production scale in a conventional commercial industry.
Field Testing	Technologies that have been demonstrated on a pilot scale under similar circumstances.
Prototype	Technologies that have been demonstrated on a bench scale using simulated feed materials.
Under Development	Technologies that are supported by conceptual studies that are not backed by bench scale experiments.
Unavailable	Technologies that are not available for use.

In addition to the hierarchy given above, other factors that influence technical maturity or technology assurance include: (I) maximizing flexibility (adaptability for new technologies or mission change), (2) design flexibility or adaptability for incorporating improved technology, and (3) avoiding regulatory uncertainty.

4.8 MAINTAINABILITY

Evaluating the complexity, reliability, and repairability of the associated product and components can assess the maintainability of a system. Complexity is influenced by factors such as the level of training required to perform maintenance on the equipment, the need for special or unique tools or procedures, design qualities such as features that ease repair, standardized parts and provisions for troubleshooting. Reliability can be directly measured by failure rates/mean

time to failure data, but is also associated with frequency of test, calibration, and preventive maintenance procedures. Another key measure of reliability is the impact of failures on the process, including recovery or downtime following a failure. Repairability is a factor of several items, including work space, location of the equipment, methods to repair or replacement, personnel requirements, technical training, waste produced during repairs, and any functional test requirements. With regard to these aspects of maintainability, this analysis will highlight those characteristics that are significantly different between the alternatives.

4.9 OPERABILITY

Operability of a facility is a typical measure of the complexity of an item or system that may influence other aspects of operations, such as the following:

Startup and Shutdown of the System. Most upset conditions can occur during startup or shutdown when the system is in an unsteady state condition. Identifying how the proposed alternative affects these tank farm activities is an important operability issue.

Process Control. Will the proposed alternative affect normal operations, activities, or process control (samples equipment removal or replacement, etc.)?

Troubleshooting and Response to Off-Normal Conditions. Will the proposed alternative affect the ability to troubleshoot or respond to an off-normal condition?

Operator Interfaces. Will the alternative require significant operational interface or control?

4.10 CONSTRUCTIBILITY

Constructibility is a measure of difficulty and probability of satisfying all design/construction specifications within the physical, chemical, and radiological environment in which construction must occur.

4.11 DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL

This criterion is a measure of the difficulty and probability of achieving successful decontamination and decommissioning (D&D) and disposal of decontaminated materials at the completion of the mission.

5.0 DESCRIPTION OF ALTERNATIVES

5.1 ASSUMPTIONS, CONSTRAINTS, AND REQUIREMENTS

Multiple factors enter into determining what remedial actions are suitable for use in the surface water control system and applicable assumptions, constraints, and requirements are critical to the successful resolution of the issue. These items provide the framework and boundary limits for implementing the actions within the system.

5.1.1 Assumptions

Assumptions are necessary to set boundaries for the alternatives and to provide a better understanding of how the alternatives apply to the problem. Assumptions also provide a set of limiting conditions under which the alternative is valid. The following assumptions were considered in the evaluation of the alternatives:

- The area directly above and adjacent to the tanks is the area of primary concern regarding water migration. A rectangular area, approximately 20 m (65 ft) from the outer edge of the tank farms on all sides, defines this primary concern area. The area herein referred to as the surface water control area is shown on the sketches in Appendix D.

- The minimum useful life for all alternatives is approximately 25 years.

- Materials removed to allow installation of an alternative(s) would be reused within the boundaries of the tank farm. (Highly contaminated materials encountered would be removed from the tank farm site and disposed of in accordance with site requirements.)

- Alternatives shall allow for vehicular access into or onto the tank farms where vehicles are currently acceptable.

- Surface water collected or redirected within the tank farms will be routed toward existing discharge points within the tank farm boundaries. Collection basins/settling ponds will not be required, but compliance with the Storm Water Discharge Permit must be met.

- The implementation of any alternative shall support future retrieval and D&D activities, such as providing crane access for equipment removal and installation.

5.1.2 CONSTRAINTS

Constraints are requirements imposed by an external organization. Constraints include guidelines and specifications that set forth engineering requirements deemed necessary for safe design, construction, and operation of the surface water control facilities. The following constraints apply to the implementation of the alternatives:

- DOE Order 5480.28 *Natural Phenomena Hazards Mitigation*
- DOE Order 5820.2A *Radioactive Waste Management*
- RPP-PRO-097 *Engineering Design and Evaluation*
- RPP-PRO-1622 *Radiological Design Review Process*
- WAC 173-303-640 *Dangerous Waste Regulations, Tank Systems*
- HNF-5183 *Tank Farms Radiological Control Manual*
- HNF-SD-WM-SAR-067 *Final Safety Analysis Report*
- HNF-SD-WM-TSR-006 *Technical Safety Requirements*

5.1.3 REQUIREMENTS

The following requirements apply to all remedial actions associated with surface water control. These requirements are consistent with those considered for safe and efficient operation and maintenance of the tank farm facilities.

- The surface water control alternatives should substantially reduce the amount of ponding and infiltration of water into the soil column.

- Dome loading on the tanks shall be limited by the static dome loading design limits.

- Maintenance activities associated with any of the alternatives should be minimized or eliminated.

- Existing vehicle and personnel access points shall be maintained in all alternatives.

5.2 ALTERNATIVES CONSIDERED

A wide range of acceptable alternatives has been considered to ensure that the chosen alternative(s) is/are appropriate.

5.2.1 Alternative 1: No Action

Alternative 1 does not provide a corrective action plan to protect human health and the environment as required by WAC-173-303-645. The "No Action" approach is not considered a viable option since it does not provide surface water control or provide for the reduction of water infiltration into the ground. Therefore, Alternative 1 will not be evaluated in Section 6.0.

5.2.2 Alternative 2: Site Grading

Alternative 2 consists of regrading and sloping the surface so that water would flow naturally off the surface water control area of the tank farm. The surface grading would configure drainage patterns to redirect surface water from the tops of the tank areas to the outside perimeter of the surface water control area and away from the tank farm vadose zone. Implementation of the site grading would be hand-labor intensive in all the tank farms. Dome loading and electrical conductors near the surface restrict the use of standard motorized construction equipment. Therefore, most of the required grading would need to be performed by hand.

Alternative 2 essentially would be ineffective in reducing the overall infiltration of surface water. Topography constraints within the tank farm and adjacent area make achieving ground slopes greater than 1% nearly impossible. Soil material is extremely porous (predominately sand and gravel) therefore water tends to infiltrate versus runoff. With ground surface slopes of 1% or less and porous soil conditions, achieving efficient run off is impossible. The majority of the precipitation occurring under these conditions is absorbed quickly into the soil unless it is winter and the ground is frozen. Alternative 2, while a viable alternative, is the least effective of all the alternatives if implemented alone.

5.2.3 Alternative 3: Geo-Fabric Liner

Alternative 3 consists of providing an impervious, geo-fabric (geomembrane liner or geosynthetic clay liner) barrier over the entire surface water control area of each tank farm. Implementation of Alternative 3 would be hand-labor intensive in most tank farms. This is caused in part by the numerous obstacles, such as valve/pump pits or monitoring risers protruding above the surface of the soil. The installation of the liner would require intensive fitting, cutting, and attaching at these locations. Dome load restrictions will also limit the available equipment that could be used for the installation.

To allow for traffic over the liner, 300 mm (12 inches) of the existing soil would have to be removed and then replaced on top of the liner, as defined by the manufacturer instructions. This excavation would require hand-labor because of dome loading restriction and extensive network of electrical conduits and conductors existing approximately 150 mm (6 inches) below grade. A portion of this excavated material may also be highly contaminated and therefore would have to be removed from the tank farm and replaced with noncontaminated material.

Alternative 3 would provide an effective method of substantially reducing surface water infiltration in the tank farms. However, the alternative would tend to concentrate a large quantity of water at the perimeter of the liner. The runoff collection system, consisting of piping and ditches, would redirect this flow away from the edge of the liner. The

discharge of water away from the surface water control area would reduce the infiltration to the surface water into the tank farm vadose zone; see Appendix D, sheet 19.

5.2.4 Alternative 4: Asphalt Concrete Paving

Alternative 4 provides a semi-impervious layer over the surface water control area. Alternative 4 would use the site grading as described in Alternative 2 and add a 60 mm (~ 2-½ in.) layer of asphalt concrete pavement over the surface water control area of each tank farm. Alternative 4 would be hand-labor intensive in most tank farms due to dome-loading restrictions and numerous obstacles, such as valve/pump pits or risers protruding above the surface of the soil.

Installation of the pavement would require intensive effort to ensure a leak-tight transition between the asphalt and the protruding items and to minimize the voids within the asphalt concrete. A special mix design with an increased fine material and asphalt content would be required. Approximately 100 mm (4 in.) of soil cover would be removed prior to installation of the asphalt concrete to minimize changes to the existing tank dome loading. The excavation would be performed by hand labor because of dome loading constraints in some farms and the existing network of electrical conduits and conductors approximately 150 mm (6 inches) below grade. A portion of the excavated material may be highly contaminated and therefore would require removal and replacement.

Alternative 4 would provide an effective method of substantially reducing surface water infiltration in the tank farms. The asphalt paving, similar to Alternative 3, would tend however to concentrate a large quantity of water at the perimeter of the liner. A runoff collection system, consisting of piping and ditches would direct flow away from the edge of the asphalt paving thereby reducing the infiltration to the vadose zone area of the tank farm; see Appendix D, ES-050051-C1, sheet 19.

5.2.5 Alternative 5: Building Enclosure

Alternative 5 provides an enclosed elevated shelter, covering the majority of the surface water control area of each tank farm.

In conjunction with the building structure, an apron of asphalt concrete pavement provided at the perimeter of the building would extend to the edge of the surface water control area. The building would span the total width of the tank farms, plus 10 m (33 feet) on each side of the tanks. Alternative 5 would require the installation of some form of foundation, due to the long spans, contributing areas, and tributary loads on the structure. The building foundations, however, would be located outside the influence zone of the tanks to minimize surcharge load effects on the tanks.

As with Alternatives 3 and 4, runoff from the asphalt concrete apron would tend to concentrate a large quantity of water at the perimeter of the liner. The runoff collection system, consisting of piping and ditches would direct flow away from the edge of the asphalt paving, thereby reducing the infiltration to the vadose zone of the tank farm; see Appendix D, sheet 19.

5.2.6 Alternative 6: Run-on Control

Alternative 6 provides a barrier outside of the tank farm fence that prevents surface water from flowing onto the tank farm from adjacent areas and would be implemented on all farms. The barrier consists primarily of one or a combination of the following as required to suit existing site conditions: (a) a 500 mm (~ 20-in.) high berm, (b) a 300 mm (~ 12-in.) deep drainage ditch, or (c) a 150 mm (~ 6-in.) high asphalt curb. These barriers provide a configured drainage pattern to direct surface water away from the tank farm areas and the surface water control area. The use of other structures should be considered, such as using pre-cast concrete components like "Jersey walls." In some cases, catch basins and piping would be utilized to divert water flow around and under existing process pipe berms; see Appendix D, ES-050051-C1, sheet 19.

Existing vehicle and personnel access points in the tank farm fences will be maintained unless tank farm operations indicates that specific access points are not required.

Implementation of Alternative 6 can be completed using conventional construction methods. As a stand-alone option, Alternative 6 would significantly reduce the

infiltration of surface water on the tank farms by eliminating the water contributions from the areas adjacent to the tank farms. Alternative 6 is one of the more cost-effective alternatives.

6.0 EVALUATION OF ALTERNATIVES

A decision matrix combines the advantages, disadvantages, hazards and risks, and costs of the alternatives. The decision matrix takes a broad, comprehensive view of the alternatives and provides the bases for the preferred alternative.

Based on selected decision criteria, each alternative was evaluated in an effort to establish the most viable option. Each decision criterion was assigned a weight factor that reflects its relative importance to other decision criteria, see Table 6-1. Appendix A provides a listing of the decision criteria and the associated weight factors.

The numerical scores for impact are interpreted as follows: Does the activity have little or no impact on the importance factor? If it has no impact or does not adversely affect the importance, the score is "0." A score of 5 (heavy) indicates that performing the alternative has a heavy impact on the importance item or it will be detrimental to maintaining the importance item. For example: Radiation exposure is assigned a weight factor of 5 for importance. If an activity will cause little or no exposure, it may receive a "0" or "1," receiving a low multiplier score. However, if exposure were to be greatly increased as a result of the activity (less conservative mode) it may be a "4" or "5." Thus receiving a high score (5 for radiation exposure multiplied by 4 for radiation exposure results in a "20" score).

Table 6-1

WEIGHT FACTOR

IMPORTANCE	WEIGHT FACTOR
Low	1
Low/Medium	2
Medium	3
Medium/High	4
High	5

Each alternative was rated on how it impacts each decision criterion. Numerical scores from 0 to 5 reflect the estimated impact of an alternative for each decision criterion. If an alternative has a high cost or could significantly impact safety, it would generate a higher number (see Table 6-2).

An impact score multiplied by the relative importance weight factor determines the alternative weighted score. This weighted score indicates how well the alternative performs. The higher the weighted score, the less favorable the alternative.

Appendix A contains the decision matrix for each tank farm, a list of the decision criteria, a weight factor table, and an impact table.

Table 6-2

IMPACT FACTOR

IMPACT	SCORE
None	0
Light	1
Light/Moderate	2
Moderate	3
Moderate/Heavy	4
Heavy	5

6.1 ADVANTAGES AND DISADVANTAGES

Refer to Table 6-3 for a comparison of the advantages and disadvantages for the surface water assessment alternatives.

Table 6-3		
SURFACE WATER ASSESSMENT		
ALTERNATIVE / COST	ADVANTAGES	DISADVANTAGES
1. No Action	Annual operation and maintenance costs in current budget	Objectives of engineering study not achieved
2. Site Grading	Simplest	Cannot achieve sufficient slope to control flow
Estimated cost: $2.80M	Partially controls surface water flow	Porous soil in farm
3. Geo-fabric Liner	Absorption layer over impervious membrane allows evaporation	Maintenance if liner is damaged
Estimated cost: $89.5M	Substantial reduction in infiltration	Hand excavation required for installation
	Objectives of engineering study achieved	Excavated soil may be contaminated and require removal. Costs assume 50% removal.
	Proven technology	
4. Asphalt Concrete Paving	Semi-impervious surface barrier is proven technology	Heat retention in summer.
		All paving and excavation performed by hand.
Estimated cost: $41.5M	Control water flow at surface	Annual maintenance and repair
	Objectives of engineering study achieved	Sealing around surface obstructions done by hand
		Excavated soil may be contaminated and require removal. Costs assume 50% removal.
5. Building Enclosure with Asphalt Apron	Eliminates infiltration	Foundation may affect underground utilities
	Controlled interior environment	May impact budgets for other programs
Estimated cost: $200M	No weather related work stoppage	Long-term operating costs
	Option to add bridge crane to support Operations and Maintenance	
	Reduce spread of contamination	
	Support retrieval and decommissioning	
	Short schedule to install	
	Objectives of engineering study achieved	
	Estimated 25 year life	
	Option to add ventilation system	
6. Run-on Control	Eliminate run-on to SST farms	Objectives of engineering study not fully achieved
Estimated cost: $787K	Does not disturb contaminated soil, or farm activities	
	Installation may use motorized equipment	

6.2 PRINCIPAL HAZARDS AND RISKS

The following hazards and risks associated with natural phenomena could affect the identified alternatives for decommissioning the wells.

6.2.1 Alternative 2: Site Grading

No other hazards or risks, including natural phenomena events or operational activities, have been identified with Alternative 2.

6.2.2 Alternative 3: Geo-synthetic Fabric Liner

No hazards or risks, as a result of natural phenomena events or operational activities, have been identified with Alternative 3.

6.2.3 Alternative 4: Asphalt Concrete Paving

No hazards or risks, as a result of natural phenomena events or operational activities, have been identified with Alternative 4.

6.2.4 Alternative 5: Building Enclosure

The proposed structure would be designed to withstand all natural phenomena events defined in the design criteria. Based on preliminary investigation, the design of the structures reviewed would satisfy both the standard code and the anticipated site-specific requirements.

6.2.5 Alternative 6: Run-on Control

No hazards or risks, as a result of natural phenomena events or operational activities, have been identified with Alternative 6.

6.3 COST INFORMATION

Table 6-4 provides a summary of the cost information for each alternative and the cost estimate is included in Appendix B.

Revision 1 of this document revises the estimates to incorporate the most current site allocation factors and to reflect proposed changes in the method of work performance. During a detailed

planning effort for a portion of the Run-on Control effort, it was determined that the costs previously provided were not adequate to address executing the work as addressed by the Statement of Work. Dividing the proposed work into numerous contracts (addressing farms individually rather than performing work as a single project addressing multiple farms) increases the proportional costs of engineering, engineering during construction, construction management, survey, and site plan development.

Table 6-4

SURFACE WATER CONTROL COST INFORMATION SUMMARY

TANK FARM	Alt 2: SITE GRADING ($ x 1000)	Alt. 3: GEO FABRIC LINER ($ x 1000)	Alt. 4: ASPHALT CONCRETE PAVING ($ x 1000)	Alt. 5: BUILDING ENCLOSURE WITH ASPHALT APRON ($ x 1000)	Alt. 6: RUN-ON CONTROL ($ x 1000)
A	$153	$6,387	$2,805	$7,819	$55
AX	$110	$4,616	$2,021	$4,992	$11
B	$243	$6,844	$3,261	$19,027	$97
BX	$251	$7,121	$3,415	$18,245	$95
BY	$251	$10,476	$4,589	$18,385	$0
C	$212	$6,030	$2,892	$17,663	$108
S	$251	$7,058	$3,373	$18,245	$87
SX	$285	$8,123	$3,892	$20,831	$79
T	$255	$7,210	$3,440	$18,766	$54
TX	$375	$10,574	$5,054	$28,049	$79
TY	$155	$4,375	$2,091	$7,438	$16
U	$255	$10,646	$4,658	$21,030	$106
TOTAL	*$2,796	$89,460	$41,491	$200,490	$787

*Only portions of most tank farms require grading.

7.0 IDENTIFICATION OF PREFERRED ALTERNATIVE

7.1 PREFERRED ALTERNATIVE

This engineering study identifies that infiltration into the vadose zone is a two-fold problem: The control of surface water within the tank farm, and the control of surface water run-on to the tank farm.

A decision matrix that compares the alternatives against defined criteria was developed for each tank farm for each alternative (see Appendix A). In Section 6.0, a weight factor was established

for each decision criteria and an impact score was defined for how an alternative met the criteria. The weight and score factors were totaled to give the total weighted score for each alternative for each farm within the matrix.

A review of the matrix and the total weighted score for each tank farm clearly indicates that controlling surface water run-on (Alternative 6) is one of best alternatives for partial infiltration remediation. This recommendation applies to all tank farms and should be a high priority. The low cost of this alternative ($787,000 for all farms) enhances this as a high priority alternative, providing significant risk reduction for very low capital cost.

The matrix also shows that the best technical and operational alternative for controlling surface water within the farms is accomplished with a building. (Note: A building is not the preferred alternative.) Alternative 5, the building enclosure, appears to provide the safest option, because it can be constructed, operated, and maintained with little public or worker safety concerns compared to the other alternatives. Alternative 5 will comply with existing regulatory regulations, and it will have little effect on the SST integrity. The building design and construction are readily available from a variety of vendors. Cost and D&D are deterring factors, but cost has not received a high weight factor in the overall decision criteria.

Alternative 5 eliminates the concern of ponding on valve and pump pit surfaces. It also eliminates the potential of surface water accumulation on all pit covers and equipment.

Alternative 5 lends itself to improving the working environment around the tank farm. The building would provide an all-weather work enclosure. The building can be sized large enough to support current and future tank farm operation and retrieval. A bridge crane or a monorail crane system could be incorporated into the design and construction and eliminate the need for truck-mounted cranes at the farms. A ventilation system could be installed in the building and further eliminate the potential of contamination spreads outside the farm. There are a substantial number of advantages with a building structure over the SSTs.

In Appendix B, Cost Estimates, within the estimate for the building enclosure, page III-B-54, costs for utilities are identified. However they are not included in the cost, but are listed as costs

to add lighting, ventilation and a bridge crane. Buildings should be installed first over the farms with the most surface contamination. However, to demonstrate the benefits of having a building over the farm, it may be preferable to install a building over one of the smallest farms and then move to the highly contaminated farms.

A building enclosure is the best operational and technical alternative to minimize surface water infiltration at the tank farms; however, due to economic concerns, it is not the preferred alternative. Table III-6.4-1 lists the rough order of magnitude (ROM) cost for all the building enclosures (Alternative 5) as $200 million. The other two feasible alternatives are a liner (Alternative 3) and asphalt paving (Alternative 4). Their ROM costs are $89.5 million and $41.5 million, respectively. There is a difference between the alternatives of $159 million. This difference does not include added costs due to escalation, operation, or maintenance. It also does not include savings to be realized from having a structure over the farm (see Section 6.1.4).

In addition, Alternatives 3 and 4 provide a substantial reduction in infiltration into the vadose zone, although not as much as an enclosure and asphalt apron. However, when the marginal increase in risk reduction is considered when going from Alternatives 3 or 4 to Alternative 5, and compared to the substantial cost increase (approximately $159 million), the qualitative cost to benefit ratio is so high that it is evident that Alternative 5 is not a practical recommendation.

Reviewing the costs of Alternatives 3 and 4 ($89.5 million versus $41.5 million, respectively), the relative risk reduction between the two, the advantages, and the disadvantages, Table III-6.1-1 leads to the conclusion that the best alternative is asphalt paving because of the lower cost. However, as identified in the disadvantages, pavement readily absorbs heat and may result in restricted activity in the farms during the summer months.

Following installation of run-on control barriers (Alternative 6), another factor should be considered. If a decision is to be made regarding a tank farm surface barrier, as part of a RCRA Corrective Measures Study, a risk analysis should be performed to determine which barrier to install, if any. The risk analysis should address the following concerns: 1) the cost of each type barrier, 2) the ease of installation, 3) maintenance costs for repairs after excavation or damage to the barrier, 4) how easily a barrier may be damaged, 5) the fact that there will be a reduced run-

on risk, 6) the frequency of tank farm flooding due to pipe failure, and 7) the incremental reduction in risk realized by each barrier compared to the incremental increase in cost. When these and other appropriate considerations are analyzed, an appropriate decision can be made. Such an analysis could lead to the selection of run-on control barriers (Alternative 6) as the sole alternative to minimize surface water infiltration at the tank farms.

7.2 UNCERTAINTIES

Alternative 5, the building enclosure, would meet or exceed the desire to reduce and control surface water within the SST farms. The only uncertainty that could present a problem would be the design and construction of the building foundation. The SST farms are a haven of uncharted underground piping and electrical conduits and conductors. These obstructions could complicate the foundation design and placement, but would not present an impossible task.

After installation of the run-on control barriers (Alternative 6), if a decision is made to install surface barriers in the tank farms, as part of a RCRA Corrective Measures Study, a risk analysis should be completed to determine which barrier to install (Alternative 3 or 4) or whether any further surface barrier work should be completed. Results of the risk analysis may indicate the run-on control barriers provide sufficient protection and the cost of further risk reduction, via surface barriers, is not justified.

8.0 REQUIRED MEASURES TO IMPLEMENT PREFERRED ALTERNATIVE

A general description of required modifications for selected alternatives is provided in Section 5.2. Following is a description of future operating and maintenance costs that will be required.

8.1 ALTERNATIVE 3 AND/OR 4: LINER AND/OR PAVING

There are no operating costs associated with a liner or paving. However, routine maintenance of either barrier would be required. Any excavation in the farms would require patching the barrier, however the cost would be minimal.

8.2 ALTERNATIVE 5: BUILDING ENCLOSURE

The future operating costs associated with Alternative 5 would include primarily the operation and maintenance of any electrical or mechanical system enhancements, selected for installation with the building system. These may include HVAC, lighting, and motorized access doors. Adders for ventilation, lighting, and bridge cranes are listed in the building enclosure estimate in Appendix B. The operation and maintenance costs for the building system would be minimal and limited to those required to repair the fabric covering due to general use.

8.3 ALTERNATIVE 6: RUN-ON CONTROL

There is no future operating costs anticipated with Alternative 6. Maintenance costs for this alternative would include periodic removal (6 –12 month intervals) of wind-eroded soil and debris, such as tumbleweeds, from the ditch lines. The magnitude of the costs for this activity would be minimal.

9.0 REFERENCES

9.1 DOCUMENTS

Ecology, EPA, and DOE, 1996, *Hanford Federal Facility Agreement and Consent Order,* (Tri Party Agreement), Washington State Department of Ecology, US Environmental Protection Agency, and US Department of Energy, Olympia, Washington.

Gee, G. W., A. L. Ward, and R. R. Kirkham. *Long-Term Stewardship Workshop*, Conference Proceedings 980652, U. S. Department of Energy, Grand Junction Colorado, June 2-3, 1998.

Gee, G. W., M. J. Fayer, M. L. Rockhold, and M. D. Campbell. *Variations in Recharge at the Hanford Site*, Northwest Science, Vol. 66, No 4, 1992.

Gee, G. W, P. J. Wierenga, B. J. Andraski, M. H. Young, M. J. Fayer, and M. L. Rockhold. *Variations in Water Balance and Recharge Potential at Three Western Desert Sites*, Soil Science Society of America Journal, Volume 58, No. 1, January-February 1994.

Gilkeson, D. E., P. C. Ohl. *Assessment of the S, SX, and SY Tank Farms Raw Water System*, Cogema, April 1998

Schroeder, B. K., J. E. Carvo. *Single-Shell Tank Interim Cover Study*, WHC-SD-WM-ES-165, February 11, 1999.

TechCon. *Forum on Reducing Water Infiltration Around Hanford Tanks*, Volume 1 and 2, Hills Conference Center, Richland, Washington, May 4-6, 1999.

Tyler, S. W., B. R. Scanlon, G. W. Gee, G. B. Allison. *Water and Solute Transport in Arid Vadose Zones*, Vadose Zone Hydrology, Cutting Across Disciplines, Oxford University Press, pp. 334-373, 1999.

9.2 CONTACTS

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9.3 REFERENCE SKETCHES

See the reference block on the engineering sketches.

9.4 INTERNET SOURCES

www.anchorinc.com

www.birdair.com

www.can-spec.com

www.clamshell.com

www.sweets.com

www.dometech.com

www.rubb.com

www.sprung.com

www.starnetint.com

www.tensarind.com

www.ukigumo.com

www.mgl.ca/~yeadon/industry

APPENDIX A

DECISION MATRIX

241-A FARM ALTERNATIVE EVALUATION
(6 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	4/12	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	4/12	4/12	2/8	1/4
OPERABILITY (4.9)			2	N/A	5/10	3/6	3/6	1/2	1/2
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	5/15	5/15	2/10	1/5
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	4/16	5/20	4/16	1/4
TOTAL WEIGHTED SCORE					**135**	**114**	**119**	**82**	**31**

241-AX FARM ALTERNATIVE EVALUATION
(4 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS 94.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	4/12	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	4/12	5/15	2/8	1/4
OPERABILITY (4.9)			2	N/A	5/10	3/6	3/6	1/2	1/2
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	5/15	5/15	2/10	1/5
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	4/16	5/20	4/16	1/4
TOTAL WEIGHTED SCORE					**135**	**114**	**120**	**82**	**31**

241-B FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Minimum Congestion)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	2/10
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	2/6	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	3/9	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	3/12	2/8
TOTAL WEIGHTED SCORE					**135**	**90**	**104**	**78**	**45**

241-BX FARM ALTERNATIVE EVALUATION
(12 Tanks, Moderate Congestion)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	2/10
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	3/9	4/12	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	4/12	4/12	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**99**	**110**	**82**	**45**

241-BY FARM ALTERNATIVE EVALUATION
(12 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	2/6	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**93**	**101**	**82**	**40**

241-C FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Moderate Congestion)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	3/9	4/12	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	4/12	4/12	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**99**	**110**	**82**	**40**

241-S FARM ALTERNATIVE EVALUATION
(12 Tanks, Moderate Congestion)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	3/9	4/12	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	4/12	4/12	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**99**	**110**	**82**	**40**

241-SX FARM ALTERNATIVE EVALUATION
(15 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	2/6	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**93**	**101**	**82**	**40**

241-T FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Minimal Congestion)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 Do Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
.egulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	2/6	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	3/9	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	3/12	2/8
TOTAL WEIGHTED SCORE					**135**	**90**	**104**	**78**	**40**

241-TX FARM ALTERNATIVE EVALUATION
(18 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
egulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	2/6	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**93**	**101**	**82**	**40**

241-TY FARM ALTERNATIVE EVALUATION
(6 Tanks, Minimal Congestion)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	2/6	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	3/9	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	3/12	2/8
TOTAL WEIGHTED SCORE					**135**	**90**	**104**	**78**	**40**

241-U FARM ALTERNATIVE EVALUATION
(12 + 4 Tanks, Congested)

DECISION CRITERIA				ALTERNATIVES					
Description			Weight Factor	1 No Action	2 Site Grading	3 Liner	4 Asphalt Concrete	5 Building	6 Run-On Control
Safety (4.1)	Public (4.1.1)	RADIATION RELEASES (4.1.1.1) NON-RADIATION RELEASES (4.1.1.2)		SCORE/WEIGHTED SCORE					
			5	N/A	5/25	4/20	3/15	2/10	1/5
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)							
	Enviro (4.1.3)	PROTECTION OF BIOTA (4.1.3.1) GROUNDWATER (4.1.3.2) ATMOSPHERIC (4.1.3.3)							
Regulatory Compliance (4.2)	DOE ORDERS (4.2.1), STATE STATUTES (4.2.2), EPA REGULATIONS (4.2.3)		3	N/A	5/15	1/3	1/3	1/3	1/3
Life-Cycle Cost analysis (4.3)	CAPITAL COST (4.3.1), OPERATING COSTS (4.3.2), DECONTAMINATION & DEMOLITION (4.3.3)		2	N/A	1/2	2/4	3/6	5/10	1/2
TANK INTEGRITY (4.4)			5	N/A	2/10	3/15	3/15	2/10	0/0
FUTURE RETRIEVAL AND PROCESSING (4.5)			4	N/A	5/20	2/8	3/12	1/4	0/0
SCHEDULE (4.6)			3	N/A	5/15	3/9	3/9	2/6	1/3
PROVEN TECHNOLOGY (4.7)			3	N/A	1/3	1/3	2/6	1/3	1/3
MAINTAINABILITY (4.8)			3	N/A	2/6	2/6	2/6	2/8	2/6
OPERABILITY (4.9)			2	N/A	5/10	2/4	2/4	1/2	2/4
CONSTRUCTIBILITY (4.10)			3	N/A	3/9	3/9	3/9	2/10	2/6
DECONTAMINATION, DECOMMISSIONING, AND DISPOSAL (4.11)			4	N/A	5/20	3/12	4/16	4/16	2/8
TOTAL WEIGHTED SCORE					**135**	**93**	**101**	**82**	**45**

APPENDIX B

COST ESTIMATES

SITE GRADING (FILE # SCE1) III-B-1

LINER OPTION (FILE # SCB1) III-B-14

ASPHALT OPTION (FILE # SCA1) III-B-31

BUILDING OPTION (FILE # SCC1) III-B-48

RUN-ON CONTROL (FILE # SCD1) III-B-71

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

DATE 10/11/00 14:18:06
BY KLR/DLG

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	1,080,000	30	324,000	1,404,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	912,000	30	274,000	1,186,000
TOTAL ESTIMATED COST (TEC)		1,992,000	30	598,000	2,590,000
900	CONSTRUCTION SUPPORT (ADJUSTED/ROUNDED)	158,000	30	48,000	206,000
TOTAL OTHER PROJECT COSTS (OPC)		158,000	30	48,000	206,000
TOTAL PROJECT COST (TPC)		2,150,000	30	646,000	2,796,000

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	10/11/00	
LEAD ESTIMATOR	DL GUNDERSON	ESTIMATING MANAGER	FC DAY
PROJECT MANAGER			
CLIENT			

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	727466	128252	855718	4.99	42700	898418	30	269525	1167944
SUBTOTAL 11	DEFINITIVE DESIGN	727466	128252	855718	4.99	42700	898418	30	269525	1167944
121100	ENGINEERING DURING CONSTRUCTION	147216	25954	173170	4.99	8641	181811	30	54543	236354
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	147216	25954	173170	4.99	8641	181811	30	54543	236354
320002	SITE GRADING	432740	435784	868524	4.99	43339	911864	30	273559	1185423
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	432740	435784	868524	4.99	43339	911864	30	273559	1185423
500000	OPERATING CONTRACTOR (CHG)	129900	21030	150930	4.99	7531	158462	30	47538	206000
PROJECT TOTAL		1,437,322	611,022	2,048,344	4.99	102,212	2,150,556	30	645,166	2,795,723

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM REMEDIAL ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE: CHG PROJECT COSTS INCLUDING RPT'S, CHG PROJECT MANAGEMENT, OPERATING AND MAINTENANCE COSTS FOR THE 25 YEAR LIFE OF THE PROJECT OR DEMOLITION OF THE PROJECT AFTER LIFE SPAN.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 72% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A... (select one or combination of the following)
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE CONTRACTOR.

B.) ASSUME MATERIAL EXCAVATED FOR DRAINAGE IS USED AS BERMS OR STOCKPILED IN FARM.

C.) ALL EXCAVATION BY HAND.

D.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

E.) ESTIMATE REVISED FROM ORIGINAL ESTIMATE BASED ON THE FOLLOWING:

1. THE RATES WERE ADJUSTED TO FY 2001 RATES.
2. ESCALATION WAS ADDED TO THE PROJECT BASED ON A FOUR-YEAR OVERALL PROJECT WITH A NOV. 2002 MIDPOINT.
3. BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. COST INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
DOE_R04 - COST CODE ACCOUNT SUMMARY

DATE 10/11/00 14:18:21
BY KLR/DLG

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	727466	128252	855718	4.99	42700	898418	30	269525	1167944
121100	ENGINEERING DURING CONSTRUCTION	147216	25954	173170	4.99	8641	181811	30	54543	236354
TOTAL 000	ENGINEERING	874682	154206	1028888	4.99	51341	1080229	30	324068	1404298
460	IMPROVEMENTS TO LAND									
320002	SITE GRADING	432740	435784	868524	4.99	43339	911864	30	273559	1185423
TOTAL 460	IMPROVEMENTS TO LAND	432740	435784	868524	4.99	43339	911864	30	273559	1185423
900	CONSTRUCTION SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	129900	21030	150930	4.99	7531	158462	30	47538	206000
TOTAL 900	CONSTRUCTION SUPPORT	129900	21030	150930	4.99	7531	158462	30	47538	206000
PROJECT TOTAL		1,437,322	611,022	2,048,344	4.99	102,212	2,150,556	30	645,166	2,795,723

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
DOE_R05 - ESTIMATE SUMMARY BY CSI DIVISION

DATE 10/11/00 14:18:28
BY KLR/DLG

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
	ENGINEERING									
90	HOME OFFICE LABOR	874682	154206	1028888	4.99	51341	1080229	30	324068	1404296
	TOTAL ENGINEERING	874,682	154,206	1,028,888	4.99	51,341	1,080,229	30	324,068	1,404,298
	CONSTRUCTION									
07	SITE IMPROVEMENTS	432740	435784	868524	4.99	43339	911864	30	273559	1185423
99	OTHER COST AND FEES	129900	21030	150930	4.99	7531	158462	30	47538	206000
	TOTAL CONSTRUCTION	562,640	456,815	1,019,455	4.99	50,870	1,070,326	30	321,097	1,391,424
	PROJECT TOTAL	1,437,322	611,022	2,048,344	4.99	102,212	2,150,556	30	645,166	2,795,723

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

DATE 10/11/00 14:18:36
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	727466	0.00	0	1818	126433	128252
121100	ENGINEERING DURING CONSTRUCTION	147216	0.00	0	368	25586	25954
320002	SITE GRADING	432740	72.00	311572	0	124211	435784
500000	OPERATING CONTRACTOR (CHG)	129900	0.00	0	0	21030	21030
PROJECT TOTAL		1,437,322		311,572	2,186	297,262	611,022

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
DOE_R08 - *ESTIMATE DETAIL BY WBS / COST CODE*

PAGE 1
DATE 10/11/00 14:18:44
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN	000	8277 MHR	8277	727466	0	0	0	0	0	727466
	168% OF TOTAL CONSTRUCTION COSTS OF APPROX $433,000										
SUBTOTAL	HOME OFFICE LABOR			8,277		0		0		0	
					727,466		0		0		727,466
TOTAL	COST CODE 00090			8,277		0		0		0	
	WBS 111100 FDNW				727,466		0		0		727,466
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 111100 DEFINITIVE DESIGN				8,277		0		0		0	
					727,466		0		0		727,466

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENG. DURING CONSTRUCTION 34% OF TOTAL CONSTRUCTION COST OF APPROX. $433,000	000	1675 MHR	1675	147216	0	0	0	0	0	147216
SUBTOTAL	HOME OFFICE LABOR			1,675	147,216	0	0	0	0	0	147,216
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			1,675	147,216	0	0	0	0	0	147,216
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				1,675	147,216	0	0	0	0	0	147,216

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002	SITE GRADING										
320002.07	SITE IMPROVEMENTS										
320002.0700002	**********	460	0 SF	0	0	0	0	0	0	0	0
	GRADING WITHIN TANK FARMS TO DRAIN WATER OUT OF THE FARM AND STOP WATER FROM POOLING										
320002.0700004	COST BASED ON 5 LABORERS WORKING 15 DAYS IN AN AVERAGE TANK FARM. **********	460	0 SF	0	0	0	0	0	0	0	0
320002.0700102	241-A FARM- SITE GRADING	460	118200 SF	0	0	0	0	23640	0	0	23640
320002.0700104	241-AX FARM- SITE GRADING	460	85500 SF	0	0	0	0	17100	0	0	17100
320002.0700106	241-B FARM- SITE GRADING	460	188000 SF	0	0	0	0	37600	0	0	37600
320002.0700108	241-BX FARM- SITE GRADING	460	194000 SF	0	0	0	0	38800	0	0	38800
320002.0700110	241-BY FARM- SITE GRADING	460	194000 SF	0	0	0	0	38800	0	0	38800
320002.0700112	241-C FARM- SITE GRADING	460	164000 SF	0	0	0	0	32800	0	0	32800
320002.0700114	241-S FARM- SITE GRADING	460	194000 SF	0	0	0	0	38800	0	0	38800
320002.0700116	241-SX FARM- SITE GRADING	460	220000 SF	0	0	0	0	44000	0	0	44000
320002.0700118	241-T FARM- SITE GRADING	460	198000 SF	0	0	0	0	39600	0	0	39600
320002.0700120	241-TX FARM- SITE GRADING	460	290000 SF	0	0	0	0	58000	0	0	58000
320002.0700122	241-TY FARM- SITE GRADING	460	120000 SF	0	0	0	0	24000	0	0	24000
320002.0700124	241-U FARM- SITE GRADING	460	198000 SF	0	0	0	0	39600	0	0	39600
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	432,740	0	0	432,740
TOTAL	COST CODE 46007			0	0	0	0	432,740	0	0	432,740
	WBS 320002 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320002 SITE GRADING				0	0	0	0	432,740	0	0	432,740

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

DATE 10/11/00 14:18:44
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX $433,000	900	1 LS	0	0	0	0	129900	0	0	129900
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	129,900	0	0	129,900
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	129,900	0	0	129,900
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	129,900	0	0	129,900

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				9,952	874,682	0	0	562,640	0	0	1,437,322

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCB1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (LINER OPTION)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

DATE 10/12/00 08:53:39
BY KLR/DLG

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	12,830,000	30	3,850,000	16,680,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	46,470,000	30	13,940,000	60,410,000
TOTAL ESTIMATED COST (TEC)		59,300,000	30	17,790,000	77,090,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	9,520,000	30	2,850,000	12,370,000
TOTAL OTHER PROJECT COSTS (OPC)		9,520,000	30	2,850,000	12,370,000
TOTAL PROJECT COST (TPC)		68,820,000	30	20,640,000	89,460,000

TYPE OF ESTIMATE	ORDER OF MAGNITUDE		10/12/00
LEAD ESTIMATOR	DL GUNDERSON	ESTIMATING MANAGER	FC DAY
PROJECT MANAGER			
CLIENT			

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	5203088	917304	6120392	4.99	305407	6425800	30	1927740	8353539
SUBTOTAL 11	DEFINITIVE DESIGN	5203088	917304	6120392	4.99	305407	6425800	30	1927740	8353539
121100	ENGINEERING DURING CONSTRUCTION	5185510	914205	6099715	4.99	304375	6404091	30	1921227	8325318
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	5185510	914205	6099715	4.99	304375	6404091	30	1921227	8325318
320002	LINER COVER	15860335	11112927	26973262	4.99	1345965	28319228	30	8495768	36814996
320003	INSULATION CUT AND REPAIR	75000	52550	127550	4.99	6364	133915	30	40174	174089
320004	WASTE DISPOSAL	10088925	7069049	17157974	4.99	856182	18014157	30	5404247	23418404
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	26024260	18234527	44258787	4.99	2208513	46467301	30	13940190	60407491
500000	OPERATING CONTRACTOR (CHG)	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
PROJECT TOTAL		44,212,858	21,328,857	65,541,715	4.99	3,270,531	68,812,246	30	20,643,674	89,455,921

1. ESTIMATE PURPOSE

PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS

A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM REMEDIAL ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE: CHG PROJECT COSTS INCLUDING RPT'S, CHG PROJECT MANAGEMENT, OPERATING AND MAINTENANCE COSTS FOR THE 25 YEAR LIFE OF THE PROJECT OR DEMOLITION OF THE PROJECT AFTER THE LIFE SPAN.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY

A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL ▼(list others). THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 45.9% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A... (select one or combination of the following)
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) FACTORS OF 1.0, 1.01, OR 1.02 ARE APPLIED AGAINST THE SUBCONTRACT AMOUNT DEPENDING UPON THE AMOUNT OF RISERS, PITS, ETC. LOCATED IN THE FARM REQUIRING LINER BOOTS AROUND.

B.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE CONTRACTOR.

C.) ESTIMATE IS BASED ON AVERAGE EXCAVATION OF 1' OVER ENTIRE AREA. ASSUME 50% EXCAVATION WASTE DISPOSAL OF FARMS A, AX, BY AND U. ASSUME 20% WASTE DISPOSAL FOR ALL OTHER FARMS. ASSUME REMAINING EXCAVATION WILL BE PLACED BACK ON LINER. ASSUME ADDITIONAL GRAVEL TO REPLACE EXCAVATION DISPOSED OF AS WASTE AND AN ADDITIONAL 1" ON TOP OF LINER.

D.) ALL EXCAVATION IS BY HAND.

E.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	5203088	917304	6120392	4.99	305407	6425800	30	1927740	8353539
121100	ENGINEERING DURING CONSTRUCTION	5185510	914205	6099715	4.99	304375	6404091	30	1921227	8325318
TOTAL 000	ENGINEERING	10388598	1831509	12220107	4.99	609783	12829891	30	3848967	16678858
460	IMPROVEMENTS TO LAND									
320002	LINER COVER	15860335	11112927	26973262	4.99	1345965	28319228	30	8495768	36814996
320003	INSULATION CUT AND REPAIR	75000	52550	127550	4.99	6364	133915	30	40174	174089
320004	WASTE DISPOSAL	10088925	7069049	17157974	4.99	856182	18014157	30	5404247	23418404
TOTAL 460	IMPROVEMENTS TO LAND	26024260	18234527	44258787	4.99	2208513	46467301	30	13940190	60407491
900	PROJECT SUPPORT									
1500000	OPERATING CONTRACTOR (CHG)	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
TOTAL 900	PROJECT SUPPORT	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
PROJECT TOTAL		44,212,858	21,328,857	65,541,715	4.99	3,270,531	68,812,246	30	20,643,674	89,455,921

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	10388598	1831509	12220107	4.99	609783	12829891	30	3848967	16678858
	TOTAL ENGINEERING		1,831,509			609,783			3,848,967	
		10,388,598		12,220,107	4.99		12,829,891	30		16,678,858
CONSTRUCTION										
07	SITE IMPROVEMENTS	26024260	18234527	44258787	4.99	2208513	46467301	30	13940190	60407491
99	OTHER COST AND FEES	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
	TOTAL CONSTRUCTION		19,497,347			2,660,748			16,794,706	
		33,824,260		53,321,607	4.99		55,982,355	30		72,777,062
PROJECT TOTAL			21,328,857			3,270,531			20,643,674	
		44,212,858		65,541,715	4.99		68,812,246	30		89,455,921

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	5203088	0.00	0	13007	904296	917304
121100	ENGINEERING DURING CONSTRUCTION	5185510	0.00	0	12963	901241	914205
320002	LINER COVER	15860335	45.90	7279893	0	3833033	11112927
320003	INSULATION CUT AND REPAIR	75000	45.90	34425	0	18125	52550
320004	WASTE DISPOSAL	10088925	45.90	4630816	0	2438232	7069049
500000	OPERATING CONTRACTOR (CHG)	7800000	0.00	0	0	1262820	1262820
PROJECT TOTAL		44,212,858		11,945,135	25,971	9,357,750	21,328,857

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCB1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (LINER OPTION)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
DATE 10/12/00 08:54:14
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN	000	59200 MHR	59200	5203088	0	0	0	0	0	5203088
	20% OF TOTAL CONSTRUCTION										
	COST OF APPROX $26,000,000										
SUBTOTAL	HOME OFFICE LABOR			59,200		0		0		0	
					5,203,088		0		0		5,203,088
TOTAL	COST CODE 00090			59,200		0		0		0	
	WBS 111100 FDNW				5,203,088		0		0		5,203,088
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 111100 DEFINITIVE DESIGN				59,200		0		0		0	
					5,203,088		0		0		5,203,088

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	*ENGINEERING DURING CONSTRUCTION*										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 20% OF TOTAL CONSTRUCTION COST OF APPROX $26,000,000	000	59000 MHR	59000	5185510	0	0	0	0	0	5185510
SUBTOTAL	HOME OFFICE LABOR			59,000	5,185,510	0	0	0	0	0	5,185,510
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			59,000	5,185,510	0	0	0	0	0	5,185,510
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				59,000	5,185,510	0	0	0	0	0	5,185,510

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002	LINER COVER										
320002.07	SITE IMPROVEMENTS										
320002.0700002	********** LINER OPTION **********	460	0	0	0	0	0	0	0	0	0
320002.0700004	DETAIL UNIT PRICE BASED ON AN AVERAGE SIZE TANK FARM **********	460	0	0	0	0	0	0	0	0	0
	WORK STEPS INCLUDED IN UNIT PRICE:										
320002.0700005	1. EXCAVATION @ $95/CY (1')	460	0	0	0	0	0	0	0	0	0
	2. ADD'L COST TO EXCAVATE AROUND CONDUITS- $10/CY										
320002.0700006	3. GRADING FOR DRAINAGE @ $3.00/SY	460	0	0	0	0	0	0	0	0	0
	4. SURVEY/STAKING @ $10,000										
320002.0700008	5. LINER TYPE TBD @ $2.00/SF	460	0	0	0	0	0	0	0	0	0
	6. MOB/DEMOB@ $7500										
	7. TRAINING/BADGING @ $1000										
320002.0700010	8. RADIATION PROTECTION ALLOWANCE @ $40,000	460	0	0	0	0	0	0	0	0	0
	9. ADDITIONAL CRUSHED GRAVEL $25/TON										
320002.0700012	10. COLLECTION/DRAINAGE PIPING @ $40/LF	460	0	0	0	0	0	0	0	0	0
	TOTAL UNIT PRICE- $7.27/SF ********** **********										
320002.0700102	241-A FARM- LINER **********	460	118200 SF	0	0	0	0	876500	0	0	876500
320002.0700104	241-AX FARM- LINER **********	460	85500 SF	0	0	0	0	634017	0	0	634017
320002.0700106	241-B FARM- LINER **********	460	188000 SF	0	0	0	0	1366760	0	0	1366760
320002.0700108	241-BX FARM- LINER **********	460	194000 SF	0	0	0	0	1424484	0	0	1424484
320002.0700110	241-BY FARM- LINER **********	460	194000 SF	0	0	0	0	1438588	0	0	1438588
320002.0700112	241-C FARM- LINER **********	460	164000 SF	0	0	0	0	1204203	0	0	1204203
320002.0700114	241-S FARM- LINER **********	460	194000 SF	0	0	0	0	1410380	0	0	1410380

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002.0700116	241-SX FARM- LINER	460	220000 SF	0	0	0	0	1631388	0	0	1631388
320002.0700118	241-T FARM- LINER	460	198000 SF	0	0	0	0	1439460	0	0	1439460
320002.0700120	241-TX FARM- LINER	460	290000 SF	0	0	0	0	2108300	0	0	2108300
320002.0700122	241-TY FARM- LINER	460	120000 SF	0	0	0	0	872400	0	0	872400
320002.0700124	241-U FARM- LINER	460	198000 SF	0	0	0	0	1453855	0	0	1453855
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	15,860,335	0	0	15,860,335
TOTAL	COST CODE 46007			0	0	0	0	15,860,335	0	0	15,860,335
	WBS 320002 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320002 LINER COVER				0	0	0	0	15,860,335	0	0	15,860,335

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003	INSULATION CUT AND REPAIR										
320003.07	SITE IMPROVEMENTS										
320003.0700102	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-A FARM**********	460	30 EA	0	0	0	0	7500	0	0	7500
320003.0700104	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-AX FARM**********	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700106	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-B FARM**********	460	10 EA	0	0	0	0	2500	0	0	2500
320003.0700108	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-BX FARM**********	460	30 EA	0	0	0	0	7500	0	0	7500
320003.0700110	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-BY FARM**********	460	35 EA	0	0	0	0	8750	0	0	8750
320003.0700112	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-C FARM**********	460	30 EA	0	0	0	0	7500	0	0	7500
320003.0700114	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-S FARM**********	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700116	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-SX FARM**********	460	25 EA	0	0	0	0	6250	0	0	6250
320003.0700118	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED 241-T FARM**********	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700120	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED	460	40 EA	0	0	0	0	10000	0	0	10000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	241-TX FARM**********										
320003.0700122	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED	460	15 EA	0	0	0	0	3750	0	0	3750
	241-TY FARM**********										
320003.0700124	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED	460	40 EA	0	0	0	0	10000	0	0	10000
	241-U FARM**********										
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	75,000	0	0	75,000
TOTAL	COST CODE 46007			0	0	0	0	75,000	0	0	75,000
	WBS 320003 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320003 INSULATION CUT AND REPAIR				0	0	0	0	75,000	0	0	75,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320004	WASTE DISPOSAL										
320004.07	SITE IMPROVEMENTS										
320004.0700002	********** DISPOSE OF 50% OF EXCAVATION AS LLW FOR FARMS A,AX,BY,U	460	0	0	0	0	0	0	0	0	0
320004.0700004	DISPOSE OF 20% OF EXCAVATION AS LLW FOR REMAINING FARMS. **********	460	0	0	0	0	0	0	0	0	0
320004.0700006	1. DISPOSAL COST - $15/CF 2. HAUL COST- $1/CF 3. REPLACEMENT WITH FILL HAULED IN @ $.50/CF TOTAL UNIT COST - $16.50/CF **********	460	0	0	0	0	0	0	0	0	0
320004.0700102	241-A FARM- DISPOSE 50% EXC **********	460	59100 CF	0	0	0	0	975150	0	0	975150
320004.0700104	241-AX FARM- DISPOSE 50% EXC **********	460	42750 CF	0	0	0	0	705375	0	0	705375
320004.0700106	241-B FARM- DISPOSE 20% EXC **********	460	37600 CF	0	0	0	0	620400	0	0	620400
320004.0700108	241-BX FARM- DISPOSE 20% EXC **********	460	38800 CF	0	0	0	0	640200	0	0	640200
320004.0700110	241-BY FARM- DISPOSE 50% EXC **********	460	97000 CF	0	0	0	0	1600500	0	0	1600500
320004.0700112	241-C FARM- DISPOSE 20% EXC **********	460	32800 CF	0	0	0	0	541200	0	0	541200
320004.0700114	241-S FARM- DISPOSE 20% EXC **********	460	38800 CF	0	0	0	0	640200	0	0	640200
320004.0700116	241-SX FARM- DISPOSE 20% EXC **********	460	44000 CF	0	0	0	0	726000	0	0	726000
320004.0700118	241-T FARM- DISPOSE 20% EXC **********	460	39600 CF	0	0	0	0	653400	0	0	653400
320004.0700120	241-TX FARM- DISPOSE 20% EXC **********	460	58000 CF	0	0	0	0	957000	0	0	957000
320004.0700122	241-TY FARM- DISPOSE 20% EXC **********	460	24000 CF	0	0	0	0	396000	0	0	396000
320004.0700124	241-U FARM- DISPOSE 20% EXC **********	460	99000 CF	0	0	0	0	1633500	0	0	1633500
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	10,088,925	0	0	0	10,088,925

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
TOTAL	COST CODE 46007			0		0		10,088,925		0	
	WBS 320004 FDNW				0			0	0		10,088,925
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320004 WASTE DISPOSAL				0		0		10,088,925		0	
					0			0	0		10,088,925

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX $26,000,000	900	1 LS	0	0	0	0	7800000	0	0	7800000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	7,800,000	0	0	7,800,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	7,800,000	0	0	7,800,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	7,800,000	0	0	7,800,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				118,200		0	33,824,260			0	
					10,388,598		0		0		44,212,858

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	9,150,000	30	2,745,000	11,895,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	18,894,000	30	5,668,000	24,562,000
TOTAL ESTIMATED COST (TEC)		28,044,000	30	8,413,000	36,457,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	3,872,000	30	1,162,000	5,034,000
TOTAL OTHER PROJECT COSTS (OPC)		3,872,000	30	1,162,000	5,034,000
TOTAL PROJECT COST (TPC)		31,916,000	30	9,575,000	41,491,000

TYPE OF ESTIMATE	ORDER OF MAGNITUDE		10/11/00
LEAD ESTIMATOR	DL GUNDERSON	ESTIMATING MANAGER	FC DAY
PROJECT MANAGER			
CLIENT			

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	5290978	932799	6223777	4.99	310566	6534343	30	1960303	8494647
SUBTOTAL 11	DEFINITIVE DESIGN	5290978	932799	6223777	4.99	310566	6534343	30	1960303	8494647
121100	ENGINEERING DURING CONSTRUCTION	2118149	373429	2491578	4.99	124329	2615908	30	784772	3400680
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	2118149	373429	2491578	4.99	124329	2615908	30	784772	3400680
320002	ASPHALT SURFACING	7439303	5212527	12651830	4.99	631326	13283157	30	3984947	17268104
320003	INSULATION CUT & REPAIR	75000	52550	127550	4.99	6364	133915	30	40174	174089
320004	WASTE DISPOSAL	3067350	2149213	5216563	4.99	260306	5476869	30	1643060	7119930
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	10581653	7414291	17995944	4.99	897997	18893941	30	5668182	24562124
500000	OPERATING CONTRACTOR (CHG)	3174000	513870	3687870	4.99	184024	3871895	30	1161568	5033463
PROJECT TOTAL			9,234,390			1,516,918			9,574,826	
		21,164,780		30,399,170	4.99		31,916,089	30		41,490,916

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM REMEDIAL ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE:CHG PROJECT COSTS INCLUDING RPT'S, CHG PROJECT MANAGEMENT, OPERATING AND MAINTENANCE COSTS FOR THE 25 YEAR LIFE OF THE PROJECT OR DEMOLITION OF THE PROJECT AFTER LIFE SPAN.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 45.9% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) FACTORS OF 1.0, 1.01, OR 1.02 ARE APPLIED AGAINST THE SUBCONTRACT AMOUNT DEPENDING UPON THE AMOUNT OF RISERS, PITS, ETC. LOCATED IN THE FARM REQUIRNG ASPHALTING AROUND.

B.) ESTIMATE IS BASED ON WORK PERFORMED BY FIXED PRICE CONTRACTOR.

C.) ESTIMATE BASED ON AVERAGE EXCAVATION OF .3' OVER ENTIRE AREA.

D.) ESTIMATE BASED ON 2 1/2" ASPHALT WITH HIGH OIL CONTENT.

E.) ASSUME 50% EXCAVATION WASTE DISPOSAL FOR FARMS A, AX, BY AND U. ASSUME 20% EXCAVATION WASTE DISPOSAL FOR ALL OTHER FARMS. ASSUME REMAINING EXCAVATION IS STOCKPILED WITHIN CURRENT FARM FENCE BOUNDRY.

F.) ALL EXCAVATION BY HAND. COMPACTION OF ASPHALT BY SMALL WALK-BEHIND ROLLERS AND PLATE COMPACTORS.

G.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	5290978	932799	6223777	4.99	310566	6534343	30	1960303	8494647
121100	ENGINEERING DURING CONSTRUCTION	2118149	373429	2491578	4.99	124329	2615908	30	784772	3400680
TOTAL 000	ENGINEERING	7409127	1306229	8715356	4.99	434896	9150252	30	2745075	11895328
460	IMPROVEMENTS TO LAND									
320002	ASPHALT SURFACING	7439303	5212527	12651830	4.99	631326	13283157	30	3984947	17268104
320003	INSULATION CUT & REPAIR	75000	52550	127550	4.99	6364	133915	30	40174	174089
320004	WASTE DISPOSAL	3067350	2149213	5216563	4.99	260306	5476869	30	1643060	7119930
TOTAL 460	IMPROVEMENTS TO LAND	10581653	7414291	17995944	4.99	897997	18893941	30	5668182	24562124
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	3174000	513870	3687870	4.99	184024	3871895	30	1161568	5033463
TOTAL 900	PROJECT SUPPORT	3174000	513870	3687870	4.99	184024	3871895	30	1161568	5033463
PROJECT TOTAL		21,164,780	9,234,390	30,399,170	4.99	1,516,918	31,916,089	30	9,574,826	41,490,916

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCA1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
ORDER OF MAGNITUDE
DOE_R05 - ESTIMATE SUMMARY BY CSI DIVISION

DATE 10/11/00 15:03:13
BY KLR/DLG

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
	ENGINEERING									
90	HOME OFFICE LABOR	7409127	1306229	8715356	4.99	434896	9150252	30	2745075	11895328
	TOTAL ENGINEERING	7,409,127	1,306,229	8,715,356	4.99	434,896	9,150,252	30	2,745,075	11,895,328
	CONSTRUCTION									
07	SITE IMPROVEMENTS	10581653	7414291	17995944	4.99	897997	18893941	30	5668182	24562124
99	OTHER COST AND FEES	3174000	513870	3687870	4.99	184024	3871895	30	1161568	5033463
	TOTAL CONSTRUCTION	13,755,653	7,928,161	21,683,814	4.99	1,082,022	22,765,837	30	6,829,751	29,595,588
	PROJECT TOTAL	21,164,780	9,234,390	30,399,170	4.99	1,516,918	31,916,089	30	9,574,826	41,490,916

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	5290978	0.00	0	13227	919571	932799
121100	ENGINEERING DURING CONSTRUCTION	2118149	0.00	0	5295	368134	373429
320002	ASPHALT SURFACING	7439303	45.90	3414640	0	1797887	5212527
320003	INSULATION CUT & REPAIR	75000	45.90	34425	0	18125	52550
320004	WASTE DISPOSAL	3067350	45.90	1407913	0	741299	2149213
500000	OPERATING CONTRACTOR (CHG)	3174000	0.00	0	0	513870	513870
PROJECT TOTAL		21,164,780		4,856,978	18,522	4,358,889	9,234,390

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCA1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
DATE 10/11/00 15:03:28
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 50% OF TOTAL CONSTRUCTION COST OF APPROX $10,580,000	000	60200 MHR	60200	5290978	0	0	0	0	0	5290978
SUBTOTAL	HOME OFFICE LABOR			60,200	5,290,978	0	0	0	0	0	5,290,978
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			60,200	5,290,978	0	0	0	0	0	5,290,978
TOTAL WBS 111100 DEFINITIVE DESIGN				60,200	5,290,978	0	0	0	0	0	5,290,978

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 20% OF TOTAL CONSTRUCTION COST OF APPROX $10,580,000	000	24100 MHR	24100	2118149	0	0	0	0	0	2118149
SUBTOTAL	HOME OFFICE LABOR			24,100	2,118,149	0	0	0	0	0	2,118,149
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			24,100	2,118,149	0	0	0	0	0	2,118,149
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				24,100	2,118,149	0	0	0	0	0	2,118,149

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002	ASPHALT SURFACING										
320002.07	SITE IMPROVEMENTS										
320002.0700002	********** ASPHALT OPTION **********	460	0	0	0	0	0	0	0	0	0
320002.0700003	DETAIL UNIT PRICE BASED ON AN AVERAGE SIZE TANK FARM **********	460	0	0	0	0	0	0	0	0	0
320002.0700004	WORK STEPS INCLUDED IN UNIT PRICE: 1. EXCAVATION @ $90/CY (.3') 2. GRADING FOR DRAINAGE @	460	0	0	0	0	0	0	0	0	0
320002.0700006	$3.00/SY 3. SURVEY/STAKING @ $10,000 4. 2 1/2" ASPHALT @ $100/TON 5. MOB/DEMOB @ $3500	460	0	0	0	0	0	0	0	0	0
320002.0700008	6. TRAINING/BADGING @ $1000 7. RADIATION PROTECTION ALLOWANCE @ $20,000	460	0	0	0	0	0	0	0	0	0
320002.0700010	8. WATER COLLECTION/DRAINAGE @ $25,000 TOTAL UNIT PRICE- $3.41/SF ********** **********	460	0	0	0	0	0	0	0	0	0
320002.0700102	241-A FARM- ASPHALT **********	460	118200 SF	0	0	0	0	411123	0	0	411123
320002.0700104	241-AX FARM- ASPHALT **********	460	85500 SF	0	0	0	0	297386	0	0	297386
320002.0700106	241-B FARM- ASPHALT **********	460	188000 SF	0	0	0	0	641080	0	0	641080
320002.0700108	241-BX FARM- ASPHALT **********	460	194000 SF	0	0	0	0	668155	0	0	668155
320002.0700110	241-BY FARM- ASPHALT **********	460	194000 SF	0	0	0	0	674771	0	0	674771
320002.0700112	241-C FARM- ASPHALT **********	460	164000 SF	0	0	0	0	564832	0	0	564832
320002.0700114	241-S FARM ASPHALT **********	460	194000 SF	0	0	0	0	661540	0	0	661540
320002.0700116	241-SX FARM- ASPHALT **********	460	220000 SF	0	0	0	0	765204	0	0	765204
320002.0700118	241-T FARM- ASPHALT **********	460	198000 SF	0	0	0	0	675180	0	0	675180

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002.0700120	241-TX FARM- ASPHALT	460	290000 SF	0	0	0	0	988900	0	0	988900
320002.0700122	241-TY FARM- ASPHALT	460	120000 SF	0	0	0	0	409200	0	0	409200
320002.0700124	241-U FARM- ASPHALT	460	198000 SF	0	0	0	0	681932	0	0	681932
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	7,439,303	0	0	0	7,439,303
TOTAL	COST CODE 46007			0	0	0	7,439,303	0	0	0	7,439,303
	WBS 320002 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320002 ASPHALT SURFACING				0	0	0	7,439,303	0	0	0	7,439,303

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003	INSULATION CUT & REPAIR										
320003.07	SITE IMPROVEMENTS										
320003.0700102	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-A FARM**********	460	30 EA	0	0	0	0	7500	0	0	7500
320003.0700104	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-AX FARM**********	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700106	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-B FARM**********	460	10 EA	0	0	0	0	2500	0	0	2500
320003.0700108	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-BX FARM**********	460	30 EA	0	0	0	0	7500	0	0	7500
320003.0700110	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-BY FARM**********	460	35 EA	0	0	0	0	8750	0	0	8750
320003.0700112	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-C FARM**********	460	30 EA	0	0	0	0	7500	0	0	7500
320003.0700114	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-S FARM**********	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700116	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-SX FARM**********	460	25 EA	0	0	0	0	6250	0	0	6250
320003.0700118	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED 241-T FARM**********	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700120	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED	460	40 EA	0	0	0	0	10000	0	0	10000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	241-TX FARM**********										
320003.0700122	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED	460	15 EA	0	0	0	0	3750	0	0	3750
	241-TY FARM**********										
320003.0700124	REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED	460	40 EA	0	0	0	0	10000	0	0	10000
	241-U FARM**********										
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	75,000	0	0	75,000
TOTAL	COST CODE 46007			0	0	0	0	75,000	0	0	75,000
	WBS 320003 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320003 INSULATION CUT & REPAIR				0	0	0	0	75,000	0	0	75,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320004	WASTE DISPOSAL										
320004.07	SITE IMPROVEMENTS										
320004.0700002	**********	460	0	0	0	0	0	0	0	0	0
	DISPOSE OF 50% OF EXCAVATION AS LLW FOR FARMS A,AX,BY,U.										
320004.0700004	DISPOSE OF 20% OF EXCAVATION AS LLW FOR REMAINING FARMS.	460	0	0	0	0	0	0	0	0	0
	**********										
	1. DISPOSAL COST - $15/CF										
	2. HAUL COST- $ 1/CF										
320004.0700006	3. REPLACEMENT WITH FILL HAULED IN @ $.50/CF	460	0	0	0	0	0	0	0	0	0
	TOTAL UNIT COST- $16.50/CF										
	**********										
320004.0700102	241-A FARM- DISPOSE 50% EXC	460	18000 CF	0	0	0	0	297000	0	0	297000
	**********										
320004.0700104	241-AX FARM- DISPOSE 50% EXC	460	13000 CF	0	0	0	0	214500	0	0	214500
	**********										
320004.0700106	241-B FARM- DISPOSE 20% EXC	460	11400 CF	0	0	0	0	188100	0	0	188100
	**********										
320004.0700108	241-BX FARM- DISPOSE 20% EXC	460	11800 CF	0	0	0	0	194700	0	0	194700
	**********										
320004.0700110	241-BY FARM- DISPOSE 50% EXC	460	29500 CF	0	0	0	0	486750	0	0	486750
	**********										
320004.0700112	241-C FARM- DISPOSE 20% EXC	460	10000 CF	0	0	0	0	165000	0	0	165000
	**********										
320004.0700114	241-S FARM- DISPOSE 20% EXC	460	11800 CF	0	0	0	0	194700	0	0	194700
	**********										
320004.0700116	241-SX FARM- DISPOSE 20% EXC	460	13400 CF	0	0	0	0	221100	0	0	221100
	**********										
320004.0700118	241-T FARM- DISPOSE 20% EXC	460	12000 CF	0	0	0	0	198000	0	0	198000
	**********										
320004.0700120	241-TX FARM- DISPOSE 20% EXC	460	17600 CF	0	0	0	0	290400	0	0	290400
	**********										
320004.0700122	241-TY FARM- DISPOSE 20% EXC	460	7300 CF	0	0	0	0	120450	0	0	120450
	**********										
320004.0700124	241-U FARM- DISPOSE 50% EXC	460	30100 CF	0	0	0	0	496650	0	0	496650
	**********										
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	3,067,350	0	0	3,067,350

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
TOTAL	COST CODE 46007			0		0		3,067,350		0	
	WBS 320004 FDNW				0		0		0		3,067,350
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320004 WASTE DISPOSAL				0		0		3,067,350		0	
					0		0		0		3,067,350

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX $10,580,000	900	1 LS	0	0	0	0	3174000	0	0	3174000
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	3,174,000	0	0	3,174,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	3,174,000	0	0	3,174,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	3,174,000	0	0	3,174,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				84,300		0		13,755,653			0
					7,409,127			0		0	21,164,780

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	22,850,000	30	6,850,000	29,700,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	121,860,000	30	36,560,000	158,420,000
TOTAL ESTIMATED COST (TEC)		144,710,000	30	43,410,000	188,120,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	9,520,000	30	2,850,000	12,370,000
TOTAL OTHER PROJECT COSTS (OPC)		9,520,000	30	2,850,000	12,370,000
TOTAL PROJECT COST (TPC)		154,230,000	30	46,260,000	200,490,000

TYPE OF ESTIMATE ORDER OF MAGNITUDE 10/12/00	REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.
LEAD ESTIMATOR DL GUNDERSON ESTIMATING MANAGER FC DAY	
PROJECT MANAGER	
CLIENT	

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCC1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
ORDER OF MAGNITUDE
DOE_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

DATE 10/12/00 08:46:22
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	11100507	1957019	13057526	4.99	651570	13709096	30	4112729	17821826
SUBTOTAL 11	DEFINITIVE DESIGN	11100507	1957019	13057526	4.99	651570	13709096	30	4112729	17821826
121100	ENGINEERING DURING CONSTRUCTION	7400338	1304679	8705017	4.99	434380	9139397	30	2741819	11881217
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	7400338	1304679	8705017	4.99	434380	9139397	30	2741819	11881217
310002	BUILDINGS	71967548	40718869	112686417	4.99	5623052	118309469	30	35492840	153802310
SUBTOTAL 31	CONSTRUCTION FORCES	71967548	40718869	112686417	4.99	5623052	118309469	30	35492840	153802310
320003	ASPHALT APRON	1576130	1104353	2680483	4.99	133756	2814239	30	844271	3658511
320004	WASTE DISPOSAL	415140	290877	706017	4.99	35230	741248	30	222374	963622
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	1991270	1395231	3386501	4.99	168986	3555487	30	1066646	4622134
500000	OPERATING CONTRACTOR (CHG)	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
PROJECT TOTAL		100,259,663	46,638,619	146,898,282	4.99	7,330,224	154,228,507	30	46,268,552	200,497,059

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM REMEDIAL ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE: CHG PROJECT COSTS INCLUDING RPT'S, CHG PROJECT MANAGEMENT, OPERATING AND MAINTENANCE COSTS FOR THE 25 YEAR LIFE OF THE PROJECT OR DEMOLITION OF THE PROJECT AFTER LIFE SPAN.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 45.9% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT
(2) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(3) A FACTOR OF 33.5% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS. 10.7% MARKUP ON PERMANENT MATERIALS.
(4) CONSUMABLES ARE ESTIMATED AT 3.5% OF DIRECT CRAFT LABORS.
(5) SPECIAL WORK PROCEDURE (SWP) FACTORS ARE APPLIED AGAINST DIRECT LABOR FOR ACTUAL TIME LOST DUE TO THE PERSONNEL PROTECTIVE EQUIPMENT AND PROCEDURES. THE RATES WHICH HAVE BEEN APPLIED ARE AS FOLLOWS:
CA WORK AT 50% (NO MASK WORK)
(6) GENERAL FOREMAN FACTOR OF 3% HAS BEEN APPLIED TO DIRECT CRAFT LABOR CREWS.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

(2) FLUOR FEDERAL SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR DANIEL NORTHWEST COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMANS COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE AND G&A/FEE TO DEVELOP A FULLY BURDENED RATE BY CRAFT.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.
(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR; 3% APPLIED TO CONSTRUCTION CRAFT LABOR.
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT. 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR, AND TO FFS CONSTRUCTION LABOR. 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS.

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MISPOINT OF NOV. 2002

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A... (select one or combination of the following)
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

6. REMARKS
=======

MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) ESTIMATE IS BASED ON BUILDING AND FOUNDATION BY FDNW CONSTRUCTION FORCES AND ASPHALT WORK BY FIXED PRICE CONTRACTOR.

B.) ESTIMATE BASED ON AVERAGE EXCAVATION OF .3' IN ASPHALTED AREAS. 2 1/2" ASPHALT WITH HIGH OIL CONTENT INSTALLED IN THOSE AREAS.

C.) ASSUME 50% EXCAVATION WASTE DISPOSAL FOR FARMS A, AX, BY AND U. ASSUME 20% EXCAVATION WASTE DISPOSAL FOR ALL OTHER FARMS. ASSUME REMAINING EXCAVATION IS STOCKPILED WITHIN CURRENT FARM FENCE BOUNDRY.

D.) ALL EXCAVATION BY HAND. COMPACTION OF ASPHALT BY SMALL WALK BEHIND ROLLERS AND PLATE COMPACTORS.

E.) BUILDING PRICES BASED ON DATA FOR CLAMSHELL'S ULTRA LARGE STRUCTURES. PRICE DOES NOT INCLUDE ELECTRICAL, VENTILATION, OR BRIDGE CRANE SYSTEMS. BUILDING SIZE IS APPROXIMATELY 30' BEYOND OUTSIDE EDGE OF TANKS WHERE FEASIBLE BECAUSE OF TERRAIN.

F.) PRICING FOR BUILDING TIEDOWNS ASSUMES ENGINEERED TIEDOWNS WILL BE SIMILAR TO 15' DEEP GROUTED CABLE TIEDOWNS INSTALLED WITH THE GUZZLER.

G.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

H.) FOLLOWING ARE ROUGH TOTAL PROJECT COSTS INCLUDING CONSTRUCTION MGT, CHG SUPPORT, FDH ADDERS & CONTIGENCY FOR EACH FARM TO ADD LIGHTING, VENTILATION AND OVERHEAD BRIDGE CRANE: (INCREASED FROM ORIGINAL ESTIMATE BY 4%)

FARM	LIGHTING($6.24/SF)	VENTILATION($0.624/SF)	BRIDGE CRANE
A- FARM	$ 593,000	$ 59,000	$ 936,000
AX-FARM	$ 374,000	$ 37,000	$ 936,000
B- FARM	$1,092,000	$109,000	$1,300,000
BX-FARM	$1,024,000	$104,000	$1,300,000
BY-FARM	$1,024,000	$104,000	$1,300,000
C- FARM	$1,024,000	$104,000	$1,300,000
S- FARM	$1,024,000	$104,000	$1,300,000
SX-FARM	$1,165.000	$116,000	$1,300,000
T- FARM	$1,050,000	$104,000	$1,300,000
TX-FARM	$1,591,000	$159,000	$1,820,000
TY-FARM	$ 603,000	$ 60,000	$ 936,000
U- FARM	$1,196,000	$120,000	$1,820,000
TOTAL	$11,760,000	$1,180,000	$15,198,000

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	11100507	1957019	13057526	4.99	651570	13709096	30	4112729	17821826
121100	ENGINEERING DURING CONSTRUCTION	7400338	1304679	8705017	4.99	434380	9139397	30	2741819	11881217
TOTAL 000	ENGINEERING	18500845	3261698	21762543	4.99	1085950	22848494	30	6854548	29703043
460	IMPROVEMENTS TO LAND									
310002	BUILDINGS	71967548	40718869	112686417	4.99	5623052	118309469	30	35492840	153802310
320003	ASPHALT APRON	1576130	1104353	2680483	4.99	133756	2814239	30	844271	3658511
320004	WASTE DISPOSAL	415140	290877	706017	4.99	35230	741248	30	222374	963622
TOTAL 460	IMPROVEMENTS TO LAND	73958818	42114100	116072918	4.99	5792038	121864957	30	36559487	158424444
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
TOTAL 900	PROJECT SUPPORT	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
PROJECT TOTAL		100,259,663	46,638,619	146,898,282	4.99	7,330,224	154,228,507	30	46,268,552	200,497,059

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
00	HOME OFFICE LABOR	18500845	3261698	21762543	4.99	1085950	22848494	30	6854548	29703043
	TOTAL ENGINEERING		3,261,698			1,085,950			6,854,548	
		18,500,845		21,762,543	4.99		22,848,494	30		29,703,043
CONSTRUCTION										
07	SITE IMPROVEMENTS	73958818	42114100	116072918	4.99	5792038	121864957	30	36559487	158424444
99	OTHER COST AND FEES	7800000	1262820	9062820	4.99	452234	9515054	30	2854516	12369571
	TOTAL CONSTRUCTION		43,376,920			6,244,273			39,414,003	
		81,758,818		125,135,738	4.99		131,380,012	30		170,794,016
	PROJECT TOTAL		46,638,619			7,330,224			46,268,552	
		100,259,663		146,898,282	4.99		154,228,507	30		200,497,059

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	11100507	0.00	0	27751	1929268	1957019
121100	ENGINEERING DURING CONSTRUCTION	7400338	0.00	0	18500	1286178	1304679
310002	BUILDINGS	71967548	33.50	24109128	689448	15920292	40718869
320003	ASPHALT APRON	1576130	45.90	723443	0	380909	1104353
320004	WASTE DISPOSAL	415140	45.90	190549	0	100328	290877
500000	OPERATING CONTRACTOR (CHG)	7800000	0.00	0	0	1262820	1262820
PROJECT TOTAL		100,259,663		25,023,121	735,700	20,879,798	46,638,619

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCC1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

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BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN 15% OF TOTAL CONSTRUCTION COST OF APPROX $74,000,000	000	126300 MHR	126300	11100507	0	0	0	0	0	11100507
SUBTOTAL	HOME OFFICE LABOR			126,300	11,100,507	0	0	0	0	0	11,100,507
TOTAL	COST CODE 00090 WBS 111100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			126,300	11,100,507	0	0	0	0	0	11,100,507
TOTAL WBS 111100 DEFINITIVE DESIGN				126,300	11,100,507	0	0	0	0	0	11,100,507

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 10% OF TOTAL CONSTRUCTION COST OF APPROX $74,000,000	000	84200 MHR	84200	7400338	0	0	0	0	0	7400338
SUBTOTAL	HOME OFFICE LABOR			84,200	7,400,338	0	0	0	0	0	7,400,338
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			84,200	7,400,338	0	0	0	0	0	7,400,338
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				84,200	7,400,338	0	0	0	0	0	7,400,338

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310002	BUILDINGS										
310002.07	SITE IMPROVEMENTS										
310002.0700002	********** BUILDING OPTION **********	460	0	0	0	0	0	0	0	0	0
310002.0700004	UNIT PRICE BASED ON "CLAMSHELL'S STRUCTURES UNIT PRICE RANGE OF $18-28/SF FOR MATERIAL	460	0	0	0	0	0	0	0	0	0
310002.0700006	USE $28/SF FOR SERIES J BUILDINGS AND $18/SF FOR SERIES H BUILDINGS **********	460	0	0	0	0	0	0	0	0	0
310002.0700202	241-A FARM- BUILDING **********	460	95000 SF	0	0	0	1710000	0	0	182970	1892970
310002.0700204	PURCHASE TYPE H BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	14 LDS	140	5963	1890	19600	0	0	2097	29550
310002.0700206	INSTALL BUILDING ON GRADE BEAM. ASSUME 26 BAYS 30 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	30 SH	3360	143102	54000	0	0	0	0	197102
310002.0700208	CLAMSHELL REP DURING INSTALL	460	30 SH	240	18000	0	0	0	0	0	18000
310002.0700211	INSTALL 1280 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	132000 LBS	317	13501	4224	0	0	0	0	17725
310002.0700212	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	104 EA	832	30534	7800	31200	0	0	3338	72872
310002.0700402	241-AX FARM- BUILDING **********	460	60000 SF	0	0	0	1080000	0	0	115560	1195560
310002.0700404	PURCHASE TYPE H BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	10 LDS	100	4259	1350	14000	0	0	1498	21107
310002.0700406	INSTALL BUILDING ON GRADE BEAM. ASSUME 16 BAYS 18 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	18 SH	2016	85861	32400	0	0	0	0	118261
310002.0700408	CLAMSHELL REP DURING INSTALL	460	18 SH	144	10800	0	0	0	0	0	10800
310002.0700411	INSTALL 980 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	100940 LBS	242	10307	3230	0	0	0	0	13537

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310002.0700412	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	64 EA	512	18790	4800	19200	0	0	2054	44844
310002.0700602	241-B FARM- BUILDING ********** TYPE J BUILDING	460	174000 SF	0	0	0	4872000	0	0	521304	5393304
310002.0700604	SHIP BUILDING TO SITE AND OFFLOAD	460	26 LDS	260	11073	3510	36400	0	0	3895	54878
310002.0700606	INSTALL BUILDING ON GRADE BEAM. ASSUME 32 BAYS 48 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	48 SH	5376	228964	86400	0	0	0	0	315364
310002.0700608	CLAMSHELL REP DURING INSTALL	460	48 SH	384	28800	0	0	0	0	0	28800
310002.0700611	INSTALL 1704 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	175512 LBS	421	17930	5616	0	0	0	0	23546
310002.0700612	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	192 EA	1536	56371	14400	57600	0	0	6163	134534
310002.0700802	241-BX FARM- BUILDING ********** TYPE J BUILDING	460	164000 SF	0	0	0	4592000	0	0	491344	5083344
310002.0700804	SHIP BUILDING TO SITE AND OFFLOAD	460	24 LDS	240	10222	3240	33600	0	0	3595	50657
310002.0700806	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS 45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	45 SH	5040	214654	81000	0	0	0	0	295654
310002.0700808	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
310002.0700811	INSTALL 1644 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	17292	5419	0	0	0	0	22711
310002.0700812	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	52848	13500	54000	0	0	5778	126126
310002.0701002	241-BY FARM- BUILDING ********** TYPE J BUILDING	460	164000 SF	0	0	0	4592000	0	0	491344	5083344
310002.0701004	SHIP BUILDING TO SITE AND OFFLOAD	460	24 LDS	240	10222	3240	33600	0	0	3595	50657
310002.0701006	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS	460	45 SH	5040	214654	81000	0	0	0	0	295654

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS										
310002.0701008	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
310002.0701011	INSTALL 1644 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	17292	5419	0	0	0	0	22711
310002.0701012	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	52848	13500	54000	0	0	5778	126126
310002.0701202	241-C FARM- BUILDING **********	460	164000 SF	0	0	0	4592000	0	0	491344	5083344
	TYPE J BUILDING										
310002.0701204	SHIP BUILDING TO SITE AND OFFLOAD	460	24 LDS	240	10222	3240	33600	0	0	3595	50657
310002.0701206	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS	460	45 SH	5040	214654	81000	0	0	0	0	295654
	45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS										
310002.0701208	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
310002.0701211	INSTALL 1644 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	17292	5419	0	0	0	0	22711
310002.0701212	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	52848	13500	54000	0	0	5778	126126
310002.0701402	241-S FARM- BUILDING **********	460	164000 SF	0	0	0	4592000	0	0	491344	5083344
	TYPE J BUILDING										
310002.0701404	SHIP BUILDING TO SITE AND OFFLOAD	460	24 LDS	240	10222	3240	33600	0	0	3595	50657
310002.0701406	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS	460	45 SH	5040	214654	81000	0	0	0	0	295654
	45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS										
310002.0701408	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
310002.0701411	INSTALL 1644 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	17292	5419	0	0	0	0	22711
310002.0701412	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	52848	13500	54000	0	0	5778	126126
310002.0701602	241-SX FARM- BUILDING **********	460	187000 SF	0	0	0	5236000	0	0	560252	5796252

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	TYPE J BUILDING										
310002.0701604	SHIP BUILDING TO SITE AND OFFLOAD	460	29 LDS	290	12351	3915	40600	0	0	4344	61210
310002.0701606	INSTALL BUILDING ON GRADE BEAM. ASSUME 36 BAYS 54 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	54 SH	6048	257584	97200	0	0	0	0	354784
310002.0701608	CLAMSHELL REP DURING INSTALL	460	54 SH	432	32400	0	0	0	0	0	32400
310002.0701611	INSTALL 1780 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	183340 LBS	440	18740	5867	0	0	0	0	24607
310002.0701612	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	216 EA	1728	63418	16200	64800	0	0	6934	151352
310002.0701802	241-T FARM- BUILDING	460	168300 SF	0	0	0	4712400	0	0	504227	5216627
	**********										
	TYPE J BUILDING										
310002.0701804	SHIP BUILDING TO SITE AND OFFLOAD	460	26 LDS	260	11073	3510	36400	0	0	3895	54878
310002.0701806	INSTALL BUILDING ON GRADE BEAM. ASSUME 32 BAYS 48 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	48 SH	5376	228964	86400	0	0	0	0	315364
310002.0701808	CLAMSHELL REP DURING INSTALL	460	48 SH	384	28800	0	0	0	0	0	28800
310002.0701811	INSTALL 1670 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	172010 LBS	413	17590	5504	0	0	0	0	23094
310002.0701812	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	192 EA	1536	56371	14400	57600	0	0	6163	134534
310002.0702002	241-TX FARM- BUILDING	460	255000 SF	0	0	0	7140000	0	0	763980	7903980
	**********										
	TYPE J BUILDING										
310002.0702004	SHIP BUILDING TO SITE AND OFFLOAD	460	38 LDS	380	16184	5130	53200	0	0	5692	80206
310002.0702006	INSTALL BUILDING ON GRADE BEAM. ASSUME 48 BAYS 72 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	72 SH	8064	343446	129600	0	0	0	0	473046
310002.0702008	CLAMSHELL REP DURING INSTALL	460	72 SH	576	43200	0	0	0	0	0	43200
310002.0702011	INSTALL 2180 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	224540 LBS	539	22956	7185	0	0	0	0	30141

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310002.0702012	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	288 EA	2304	84557	21600	86400	0	0	9245	201802
310002.0702202	241-TY FARM- BUILDING	460	96000 SF	0	0	0	1728000	0	0	184896	1912896
	********** TYPE H BUILDING										
310002.0702204	SHIP BUILDING TO SITE AND OFFLOAD	460	14 LDS	140	5963	1890	19600	0	0	2097	29550
310002.0702206	INSTALL BUILDING ON GRADE BEAM. ASSUME 25 BAYS 14 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	14 SH	1568	66781	25200	0	0	0	0	91981
310002.0702208	CLAMSHELL REP DURING INSTALL	460	14 SH	112	8400	0	0	0	0	0	8400
310002.0702211	INSTALL 1280 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	131840 LBS	316	13458	4219	0	0	0	0	17677
310002.0702212	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	100 EA	800	29360	7500	30000	0	0	3210	70070
310002.0702402	241-U FARM- BUILDING	460	192000 SF	0	0	0	5376000	0	0	575232	5951232
	********** TYPE J BUILDING										
310002.0702404	SHIP BUILDING TO SITE AND OFFLOAD	460	29 LDS	290	12351	3915	40600	0	0	4344	61210
310002.0702406	INSTALL BUILDING ON GRADE BEAM. ASSUME 36 BAYS 54 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	54 SH	6048	257584	97200	0	0	0	0	354784
310002.0702408	CLAMSHELL REP DURING INSTALL	460	54 SH	432	32400	0	0	0	0	0	32400
310002.0702411	INSTALL 1810 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	186430 LBS	447	19038	5966	0	0	0	0	25004
310002.0702412	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	216 EA	1728	63418	16200	64800	0	0	6934	151352
SUBTOTAL	SITE IMPROVEMENTS			86,475	1,190,857			0	5,483,192		
				3,718,706		51,244,800			0		61,637,555
	CONSUMABLES 3.50 %					130154					130154
	SWP 50.00%			43238	1859353						1859353
	GENERAL FOREMAN 3.00 %			3891	167341						167341

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	GENERAL REQUIREMENTS 20.00 %			26721	1149080						1149080
	SALES TAX 8.00 %						4109996		0		4109996
	OH&P (ON MARKUPS ONLY)									453696	453696
TOTAL	COST CODE 46007			160,324	1,190,857			0	5,936,888		
	WBS 310002 FDNW			6,894,480	55,484.951				0		69,507,177
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
310002.07	SITE IMPROVEMENTS										
310002.0700210	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1280 LF A-FARM	460 S	132000 LBS	2376	101194	0	46200	0	0	4943	152337
310002.0700410	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 980 LF AX FARM	460 S	100940 LBS	1817	77386	0	35329	0	0	3780	116495
310002.0700610	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1704 LF B FARM	460 S	175512 LBS	3159	134542	0	61429	0	0	6573	202544
310002.0700810	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LF BX FARM	460 S	169332 LBS	3048	129814	0	59266	0	0	6341	195421
310002.0701010	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LF BY FARM	460 S	169332 LBS	3048	129814	0	59266	0	0	6341	195421
310002.0701210	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LF C FARM	460 S	169332 LBS	3048	129814	0	59266	0	0	6341	195421
310002.0701410	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LF S FARM	460 S	169332 LBS	3048	129814	0	59266	0	0	6341	195421
310002.0701610	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1780 LF SX FARM	460 S	183340 LBS	3300	140547	0	64169	0	0	6866	211582
310002.0701810	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM	460 S	172010 LBS	3096	131859	0	60204	0	0	6442	198505

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	1670 LF T FARM										
310002.0702010	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM	460	S 224540 LBS	4042	172149	0	78589	0	0	8409	259147
	2180 LF TX FARM										
310002.0702210	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM	460	S 131840 LBS	2373	101066	0	46144	0	0	4937	152147
	1280 LF TY FARM										
310002.0702410	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM	460	S 186430 LBS	3356	142932	0	65251	0	0	6982	215165
	1810 LF U FARM										
SUBTOTAL	SITE IMPROVEMENTS		(SHOP)	35,711		0		0		74,296	
					1,520,931		694,379		0		2,289,606
	CONSUMABLES 3.50 %						53232				53232
	GENERAL FOREMAN 3.00 %			1071	45627						45627
	SALES TAX 8.00 %						59808		0		59808
	OH&P (ON MARKUPS ONLY)									12095	12095
TOTAL	COST CODE 46007			36,782		0		0		86,391	
	WBS 310002 FDNW				1,566,558		807,420		0		2,460,370
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 310002 BUILDINGS				197,106		1,190,857		0		6,023,279	
					8,461,039		56,292,371		0		71,967,548

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003	ASPHALT APRON										
320003.07	SITE IMPROVEMENTS										
320003.0700002	**********	460	0 SF	0	0	0	0	0	0	0	0
	ASPHALT PERIMETER AROUND OUTSIDE OF BUILDINGS										
	**********										
320003.0700004	1. EXCAVATION @ $90/CY (.3')	460	0 SF	0	0	0	0	0	0	0	0
	2. GRADING FOR DRAINAGE @ $3.00/SY										
320003.0700006	3. SURVEY AND STAKING @ $5000	460	0 SF	0	0	0	0	0	0	0	0
	4. 2 1/2" ASPHALT @ $100/TON										
	5. MOB & DEMOB @ $3500										
	6. TRAINING/BADGING @ $1000										
320003.0700008	7. RADIATION PROTECTION ALLOWANCE @ $10000	460	0 SF	0	0	0	0	0	0	0	0
	8. WATER COLLECTION/DRAINAGE @ $15000										
320003.0700010	TOTAL UNIT PRICE- $5.61/SF	460	0 SF	0	0	0	0	0	0	0	0
	**********										
320003.0700102	241-A FARM- ASPHALT APRON	460	23640 SF	0	0	0	0	132620	0	0	132620
	**********										
320003.0700104	241-AX FARM- ASPHALT APRON	460	14760 SF	0	0	0	0	82804	0	0	82804
	**********										
320003.0700106	241-B FARM- ASPHALT APRON	460	15000 SF	0	0	0	0	84150	0	0	84150
	**********										
320003.0700108	241-BX FARM- ASPHALT APRON	460	30000 SF	0	0	0	0	168300	0	0	168300
	**********										
320003.0700110	241-BY FARM- ASPHALT APRON	460	30000 SF	0	0	0	0	168300	0	0	168300
	**********										
320003.0700112	241-C FARM- ASPHALT APRON	460	1000 SF	0	0	0	0	5610	0	0	5610
	**********										
320003.0700114	241-S FARM- ASPHALT APRON	460	30000 SF	0	0	0	0	168300	0	0	168300
	**********										
320003.0700116	241-SX FARM- ASPHALT APRON	460	33000 SF	0	0	0	0	185130	0	0	185130
	**********										
320003.0700118	241-T FARM- ASPHALT APRON	460	29700 SF	0	0	0	0	166617	0	0	166617
	**********										
320003.0700120	241-TX FARM- ASPHALT APRON	460	35000 SF	0	0	0	0	196350	0	0	196350
	**********										
320003.0700122	241-TY FARM- ASPHALT APRON	460	24000 SF	0	0	0	0	134640	0	0	134640
	**********										

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003.0700124	241-U FARM- ASPHALT APRON	460	14850 SF	0	0	0	0	83309	0	0	83309
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	1,576,130	0	0	1,576,130
TOTAL	COST CODE 46007 WBS 320003 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	1,576,130	0	0	1,576,130
TOTAL WBS 320003 ASPHALT APRON				0	0	0	0	1,576,130	0	0	1,576,130

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320004	WASTE DISPOSAL										
320004.07	SITE IMPROVEMENTS										
320004.0700002	**********	460	0	0	0	0	0	0	0	0	0
	DISPOSE OF 50% OF EXCAVATION AS LLW FOR FARMS A.AX.BY,U										
320004.0700004	DISPOSE OF 20% OF EXCAVATION AS LLW FOR REMAINING FARMS.	460	0	0	0	0	0	0	0	0	0
	**********										
	1. DISPOSAL COST - $15/CF										
	2. HAUL COST - $1/CF										
320004.0700006	3. REPLACEMENT WITH FILL HAULED IN @ $.50/CF	460	0	0	0	0	0	0	0	0	0
	TOTAL UNIT COST - $16.50/CF										
	**********										
320004.0700102	241-A FARM- DISPOSE 50% EXC	460	3600 CF	0	0	0	0	59400	0	0	59400
	**********										
320004.0700104	241-AX FARM- DISPOSE 50% EXC	460	2300 CF	0	0	0	0	37950	0	0	37950
	**********										
320004.0700106	241-B FARM- DISPOSE 20% EXC	460	1000 CF	0	0	0	0	16500	0	0	16500
	**********										
320004.0700108	241-BX FARM- DISPOSE 20% EXC	460	1900 CF	0	0	0	0	31350	0	0	31350
	**********										
320004.0700110	241-BY FARM- DISPOSE 50% EXC	460	4600 CF	0	0	0	0	75900	0	0	75900
	**********										
320004.0700112	241-C FARM- DISPOSE 20% EXC	460	60 CF	0	0	0	0	990	0	0	990
	**********										
320004.0700114	241-S FARM- DISPOSE 20% EXC	460	1900 CF	0	0	0	0	31350	0	0	31350
	**********										
320004.0700116	241-SX FARM- DISPOSE 20% EXC	460	2000 CF	0	0	0	0	33000	0	0	33000
	**********										
320004.0700118	241-T FARM- DISPOSE 20% EXC	460	1800 CF	0	0	0	0	29700	0	0	29700
	**********										
320004.0700120	241-TX FARM- DISPOSE 20% EXC	460	2200 CF	0	0	0	0	36300	0	0	36300
	**********										
320004.0700122	241-TY FARM- DISPOSE 20% EXC	460	1500 CF	0	0	0	0	24750	0	0	24750
	**********										
320004.0700124	241-U FARM- DISPOSE 50% EXC	460	2300 CF	0	0	0	0	37950	0	0	37950
	**********										
SUBTOTAL	SITE IMPROVEMENTS			0	0	0	0	415,140	0	0	415,140

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
TOTAL	COST CODE 46007			0		0		415,140		0	
	WBS 320004 FDNW				0		0		0		415,140
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320004 WASTE DISPOSAL				0		0		415,140		0	
					0		0		0		415,140

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.990102	CHG PROJECT SUPPORT 30% OF TOTAL CONSTR. COST (NOT INCLUDING PURCHASE OF THE STRUCTURES) OF $26000000	900	1 LS	0	0	0	0	7800000	0	0	7800000
SUBTOTAL	OTHER COST AND FEES			0	0	0	7,800,000	0	0	0	7,800,000
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	7,800,000	0	0	0	7,800,000
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	7,800,000	0	0	0	7,800,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				407,606	1,190,857		9,791,270		6,023,279		
					26,961,884		56,292,371		0		100,259,663

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCD1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

DATE 10/11/00 13:52:37
BY KLR/DLG

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	297,000	30	89,000	386,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	251,000	30	75,000	326,000
TOTAL ESTIMATED COST (TEC)		548,000	30	164,000	712,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	58,000	30	17,000	75,000
TOTAL OTHER PROJECT COSTS (OPC)		58,000	30	17,000	75,000
TOTAL PROJECT COST (TPC)		606,000	30	181,000	787,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/11/00

LEAD ESTIMATOR: DL GUNDERSON — ESTIMATING MANAGER: FC DAY

PROJECT MANAGER

CLIENT

REMARKS: BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	199950	35251	235201	4.99	11736	246937	30	74081	321019
SUBTOTAL 11	DEFINITIVE DESIGN	199950	35251	235201	4.99	11736	246937	30	74081	321019
121100	ENGINEERING DURING CONSTRUCTION	40429	7127	47556	4.99	2373	49929	30	14978	64908
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	40429	7127	47556	4.99	2373	49929	30	14978	64908
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	119863	238889	4.99	11920	250810	30	75243	326053
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	119026	119863	238889	4.99	11920	250810	30	75243	326053
500000	OPERATING CONTRACTOR (CHG)	47600	7706	55306	4.99	2759	58066	30	17419	75486
PROJECT TOTAL		407,005	169,948	576,953	4.99	28,789	605,743	30	181,723	787,466

1. ESTIMATE PURPOSE
==========
PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM REMEDIAL ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE: CHG COSTS INCLUDING RPT'S. FFS PROJECT MANAGEMENT, OPERATING AND MAINTENANCE COSTS FOR THE 25 YEAR LIFE OF THE PROJECT OR DEMOLITION OF THE PROJECT AFTER LIFE SPAN.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 72% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.
(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR:
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A... (select one or combination of the following)
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

7. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) WORK IS PERFORMED OUT OF TANK FARMS TO CONTROL WATER FROM RUNNING INTO THE FARMS.

B.) ESTIMATE IS BASED ON WORK PERFORMED BY A FIXED PRICE CONTRACTOR.

C.) AMOUNT OF BERMS, ASPHALT CURBING, DRAINAGE SYSTEMS AND DRAINAGE DITCHES AS SUPPLIED BY FDNW PROJECT MANAGER.

D.) BERMS AT EACH FARM AS FOLLOWS: A-482', B-604', BX-932', C-1062', S-860', SX-774', T-532'
DITCH AT EACH FARM AS FOLLOWS: B-392', U-635', TY-394'
CURB AT EACH FARM AS FOLLOWS: A-53', TX-725', AX-100'
CULVERT AT EACH FARM AS FOLLOWS: B-70', U-280'
CATCH BASINS AT EACH FARM AS FOLLOWS: B-2 EA, U-2 EA

E.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

F.) ESTIMATE REVISED FROM ORIGINAL ESTIMATE BASED ON THE FOLLOWING:

1. THE RATES WERE ADJUSTED TO FY 2001 RATES.
2. ESCALATION WAS ADDED TO THE PROJECT BASED ON A FOUR-YEAR OVERALL PROJECT WITH A NOV. 2002 MIDPOINT.
3. BASED ON A DETAILED PLANNING EFFORT FOR THE RUN-ON CONTROL SUBTASK, THE METHODOLOGY USED TO DETERMINE OVERALL ENGINEERING, ENGINEERING DURING CONSTRUCTION AND CONSTRUCTION MANAGEMENT COSTS WERE NOT ADEQUATE TO ADDRESS EXECUTING THE WORK IN THE METHOD DEFINED BY THE RUN-ON CONTROL SOW. ESTIMATE INCREASES CAN BE ATTRIBUTED TO INDIVIDUAL WORK SCOPES AND AND LOCATIONS REQUIRING SURVEY, SITE PLAN DEVELOPMENT, ETC. CONSTRUCTION SUPPORT ACTIVITIES INCREASED DUE TO ADDING NUMEROUS CONTRACTS, WORK SCOPES AND PROJECT EVOLUTION TO MEET AVAILABLE FUNDING LEVELS.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	199950	35251	235201	4.99	11736	246937	30	74081	321019
121100	ENGINEERING DURING CONSTRUCTION	40429	7127	47556	4.99	2373	49929	30	14978	64908
TOTAL 000	ENGINEERING	240379	42378	282757	4.99	14109	296867	30	89060	385927
460	IMPROVEMENTS TO LAND									
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	119863	238889	4.99	11920	250810	30	75243	326053
TOTAL 460	IMPROVEMENTS TO LAND	119026	119863	238889	4.99	11920	250810	30	75243	326053
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	47600	7706	55306	4.99	2759	58066	30	17419	75486
TOTAL 900	PROJECT SUPPORT	47600	7706	55306	4.99	2759	58066	30	17419	75486
PROJECT TOTAL		407,005	169,948	576,953	4.99	28,789	605,743	30	181,723	787,466

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	240379	42378	282757	4.99	14109	296867	30	89060	385927
	TOTAL ENGINEERING	240,379	42,378	282,757	4.99	14,109	296,867	30	89,060	385,927
CONSTRUCTION										
02	SITE PREPARATION	119026	119863	238889	4.99	11920	250810	30	75243	326053
99	OTHER COST AND FEES	47600	7706	55306	4.99	2759	58066	30	17419	75486
	TOTAL CONSTRUCTION	166,626	127,569	294,195	4.99	14,680	308,876	30	92,662	401,539
	PROJECT TOTAL	407,005	169,948	576,953	4.99	28,789	605,743	30	181,723	787,466

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCD1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

DATE 10/11/00 13:53:04
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	199950	0.00	0	499	34751	35251
121100	ENGINEERING DURING CONSTRUCTION	40429	0.00	0	101	7026	7127
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	72.00	85698	0	34164	119863
500000	OPERATING CONTRACTOR (CHG)	47600	0.00	0	0	7706	7706
PROJECT TOTAL		407,005		85,698	600	83,649	169,948

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCD1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
DOE_R01 - PROJECT COST SUMMARY

DATE 10/11/00 13:52:37
BY KLR/DLG

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING	297,000	30	89,000	386,000
460	IMPROVEMENTS TO LAND (ADJUSTED/ROUNDED)	251,000	30	75,000	326,000
TOTAL ESTIMATED COST (TEC)		548,000	30	164,000	712,000
900	PROJECT SUPPORT (ADJUSTED/ROUNDED)	58,000	30	17,000	75,000
TOTAL OTHER PROJECT COSTS (OPC)		58,000	30	17,000	75,000
TOTAL PROJECT COST (TPC)		606,000	30	181,000	787,000

TYPE OF ESTIMATE: ORDER OF MAGNITUDE 10/11/00	REMARKS:
LEAD ESTIMATOR: DL GUNDERSON ESTIMATING MANAGER: FC DAY	
PROJECT MANAGER	
CLIENT	

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	199950	35251	235201	4.99	11736	246937	30	74081	321019
SUBTOTAL 11	DEFINITIVE DESIGN	199950	35251	235201	4.99	11736	246937	30	74081	321019
121100	ENGINEERING DURING CONSTRUCTION	40429	7127	47556	4.99	2373	49929	30	14978	64908
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	40429	7127	47556	4.99	2373	49929	30	14978	64908
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	119863	238889	4.99	11920	250810	30	75243	326053
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	119026	119863	238889	4.99	11920	250810	30	75243	326053
500000	OPERATING CONTRACTOR (CHG)	47600	7706	55306	4.99	2759	58066	30	17419	75486
PROJECT TOTAL		407,005	169,948	576,953	4.99	28,789	605,743	30	181,723	787,466

1. ESTIMATE PURPOSE

PLANNING/FEASIBILITY ESTIMATE: THIS ESTIMATE WILL BE USED FOR A SCOPING STUDY.

2. ESTIMATE TECHNICAL BASIS

A. THIS ESTIMATE HAS BEEN PREPARED FOR THE INTERIM REMEDIAL ACTIONS PROJECT AS REQUESTED BY FFS PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE: CHG COSTS INCLUDING RPT'S, FFS PROJECT MANAGEMENT, OPERATING AND MAINTENANCE COSTS FOR THE 25 YEAR LIFE OF THE PROJECT OR DEMOLITION OF THE PROJECT AFTER LIFE SPAN.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FFS DEFINED CODE OF ACCOUNTS.

3. ESTIMATE METHODOLOGY

A. DIRECT COSTS:
A BOTTOMS-UP TECHNIQUE, COST REVIEW AND UPDATE TECHNIQUE, TREND ANALYSIS TECHNIQUE & EXPERT OPINION TECHNIQUE HAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.
(1) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES, PUBLISHED ESTIMATING MANUALS/DATABASES: IN HOUSE DATABASES, R.S. MEANS, RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS, NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION. INC. (NECA) MANUAL OF LABOR UNITS, ELECTRICAL RESOURCES, INC. ELECTRICAL ESTIMATING PRICE AND LABOR MANUAL. THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
(2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR DYNCORP HAVE BEEN PROVIDED BY FFS PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) CONTRACT ADMINISTRATION FACTOR OF 72% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT, FFS G&A AND FEE.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS ARE INCLUDED IN THE UNIT RATES USED TO DEVELOP COSTS FOUND IN THE SUBCONTRACT COLUMN OF THE ESTIMATE DETAIL REPORT.

D. RATES:
(1) FOR ESTIMATING PURPOSES, AVERAGE FFS RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

E. SITE ALLOCATIONS FACTORS:
SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.
(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 17.38%
(3) FDH SUBCONTRACT - G&A/FEE RATE (16.19%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (1%) AND G&A (16.19%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 17.38%
(5) FDH G&A OF 16.19% APPLIED TO CHG PROJECT COSTS

4. ESCALATION
==========
ESCALATION HAS BEEN APPLIED AT 4.99% BASED ON WORK BEING PERFORMED IN THE NEXT FOUR FISCAL YEARS WITH A MIDPOINT OF NOV. 2002.

5. CONTINGENCY
==========
A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A... (select one or combination of the following)
PLANNING ESTIMATE - EXPERIMENTAL/SPECIAL CONDITIONS = UP TO 50%

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS (# ALL) A CONTINGENCY OF 30% HAS BEEN APPLIED BECAUSE OF NO DESIGN MEDIA, UNKNOWN CONTAMINATION LEVELS.

7. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) WORK IS PERFORMED OUT OF TANK FARMS TO CONTROL WATER FROM RUNNING INTO THE FARMS.

B.) ESTIMATE IS BASED ON WORK PERFORMED BY A FIXED PRICE CONTRACTOR.

C.) AMOUNT OF BERMS, ASPHALT CURBING, DRAINAGE SYSTEMS AND DRAINAGE DITCHES AS SUPPLIED BY FDNW PROJECT MANAGER.

D.) BERMS AT EACH FARM AS FOLLOWS: A-482', B-604', BX-932', C-1062', S-860', SX-774', T-532'
DITCH AT EACH FARM AS FOLLOWS: B-392', U-635', TY-394'
CURB AT EACH FARM AS FOLLOWS: A-53', TX-725', AX-100'
CULVERT AT EACH FARM AS FOLLOWS: B-70', U-280'
CATCH BASINS AT EACH FARM AS FOLLOWS: B-2 EA, U-2 EA

E.) ESTIMATE BASIS FOR THE CHG TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY CHG.

COST CODE/WBS	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
000	ENGINEERING									
111100	DEFINITIVE DESIGN	199950	35251	235201	4.99	11736	246937	30	74081	321019
121100	ENGINEERING DURING CONSTRUCTION	40429	7127	47556	4.99	2373	49929	30	14978	64908
TOTAL 000	ENGINEERING	240379	42378	282757	4.99	14109	296867	30	89060	385927
460	IMPROVEMENTS TO LAND									
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	119863	238889	4.99	11920	250810	30	75243	326053
TOTAL 460	IMPROVEMENTS TO LAND	119026	119863	238889	4.99	11920	250810	30	75243	326053
900	PROJECT SUPPORT									
500000	OPERATING CONTRACTOR (CHG)	47600	7706	55306	4.99	2759	58066	30	17419	75486
TOTAL 900	PROJECT SUPPORT	47600	7706	55306	4.99	2759	58066	30	17419	75486
PROJECT TOTAL		407,005	169,948	576,953	4.99	28,789	605,743	30	181,723	787,466

CSI/CCA	DESCRIPTION	DIRECT SUBTOTAL	INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
ENGINEERING										
90	HOME OFFICE LABOR	240379	42378	282757	4.99	14109	296867	30	89060	385927
	TOTAL ENGINEERING	240,379	42,378	282,757	4.99	14,109	296,867	30	89,060	385,927
CONSTRUCTION										
02	SITE PREPARATION	119026	119863	238889	4.99	11920	250810	30	75243	326053
99	OTHER COST AND FEES	47600	7706	55306	4.99	2759	58066	30	17419	75486
	TOTAL CONSTRUCTION	166,626	127,569	294,195	4.99	14,680	308,876	30	92,662	401,539
	PROJECT TOTAL	407,005	169,948	576,953	4.99	28,789	605,743	30	181,723	787,466

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCD1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

DATE 10/11/00 13:53:04
BY KLR/DLG

WBS	DESCRIPTION	DIRECT SUBTOTAL	CONSTRUCTION %	MGMT/ADMIN TOTAL	DYNCORP EQUIP	SITE INDIRECTS	TOTAL INDIRECTS
111100	DEFINITIVE DESIGN	199950	0.00	0	499	34751	35251
121100	ENGINEERING DURING CONSTRUCTION	40429	0.00	0	101	7026	7127
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	72.00	85698	0	34164	119863
500000	OPERATING CONTRACTOR (CHG)	47600	0.00	0	0	7706	7706
PROJECT TOTAL		407,005		85,698	600	83,649	169,948

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCD1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
DATE 10/11/00 13:53:12
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN										
111100.90	HOME OFFICE LABOR										
111100.9000102	DESIGN	000	2275 MHR	2275	199950	0	0	0	0	0	199950
	168% OF TOTAL CONSTRUCTION										
	COST OF APPROX $119,000										
SUBTOTAL	HOME OFFICE LABOR			2,275		0		0		0	
					199,950		0		0		199,950
TOTAL	COST CODE 00090			2,275		0		0		0	
	WBS 111100 FDNW				199,950		0		0		199,950
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 111100 DEFINITIVE DESIGN				2,275		0		0		0	
					199,950		0		0		199,950

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 34% OF TOTAL CONSTRUCTION COST OF APPORX $124,000	000	460 MHR	460	40429	0	0	0	0	0	40429
SUBTOTAL	HOME OFFICE LABOR			460	40,429	0	0	0	0	0	40,429
TOTAL	COST CODE 00090 WBS 121100 FDNW (ESCALATION 4.99% - CONTINGENCY 30.00 %)			460	40,429	0	0	0	0	0	40,429
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				460	40,429	0	0	0	0	0	40,429

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE										
320001.02	SITE PREPARATION										
320001.0200002	**********	460	0	0	0	0	0	0	0	0	0
	BERMS										
	**********										
320001.0200004	CONSTRUCT BERM & STABILIZE	460	5246 LF	0	0	0	0	73969	0	0	73969
320001.0200006	**********	460	0	0	0	0	0	0	0	0	0
	ASPHALT CURBING										
	**********										
320001.0200008	PLACE GRAVEL & ASPHALT	460	4390 SF	0	0	0	0	13170	0	0	13170
320001.0200010	**********	460	0	0	0	0	0	0	0	0	0
	DRAINAGE SYSTEM										
	**********										
320001.0200012	PIPING & CATCH BASINS	460	1 LS	0	0	0	0	14000	0	0	14000
	8"PVC PIPE 350 LF										
	4 EA CATCH BASINS										
320001.0200014	**********	460	0	0	0	0	0	0	0	0	0
	DRAINAGE DITCH										
	**********										
320001.0200016	EXCAVATION GRADE/GRAVEL	460	1421 LF	0	0	0	0	7887	0	0	7887
320001.0200018	**********	460	0	0	0	0	0	0	0	0	0
	MISC. CONSTRUCTION										
	**********										
320001.0200020	RELOCATE ITEMS IN CONSTRUCTION PATH	460	1 LS	0	0	0	0	5000	0	0	5000
320001.0200022	MOBE/DEMOBE	460	1 LS	0	0	0	0	5000	0	0	5000
SUBTOTAL	SITE PREPARATION			0	0	0	0	119,026	0	0	119,026
TOTAL	COST CODE 46002			0	0	0	0	119,026	0	0	119,026
	WBS 320001 FDNW										
	(ESCALATION 4.99% - CONTINGENCY 30.00 %)										
TOTAL WBS 320001 OUTSIDE FARMS BERM/ASPHALT/DRAINAGE				0	0	0	0	119,026	0	0	119,026

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (CHG)										
500000.99	OTHER COST AND FEES										
500000.9900102	CHG PROJECT SUPPORT 40% OF TOTAL CONSTRUCTION COST OF APPROX $119,000	900	1 LS	0	0	0	0	47600	0	0	47600
SUBTOTAL	OTHER COST AND FEES			0	0	0	0	47,600	0	0	47,600
TOTAL	COST CODE 90099 WBS 500000 LMHC (ESCALATION 4.99% - CONTINGENCY 30.00 %)			0	0	0	0	47,600	0	0	47,600
TOTAL WBS 500000 OPERATING CONTRACTOR (CHG)				0	0	0	0	47,600	0	0	47,600

FLUOR FEDERAL SERVICES, INC.
CHG
JOB NO. Z696
FILE NO. Z696SCD1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 5
DATE 10/11/00 13:53:12
BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				2,735	240,379	0	0	166,626	0	0	407,005

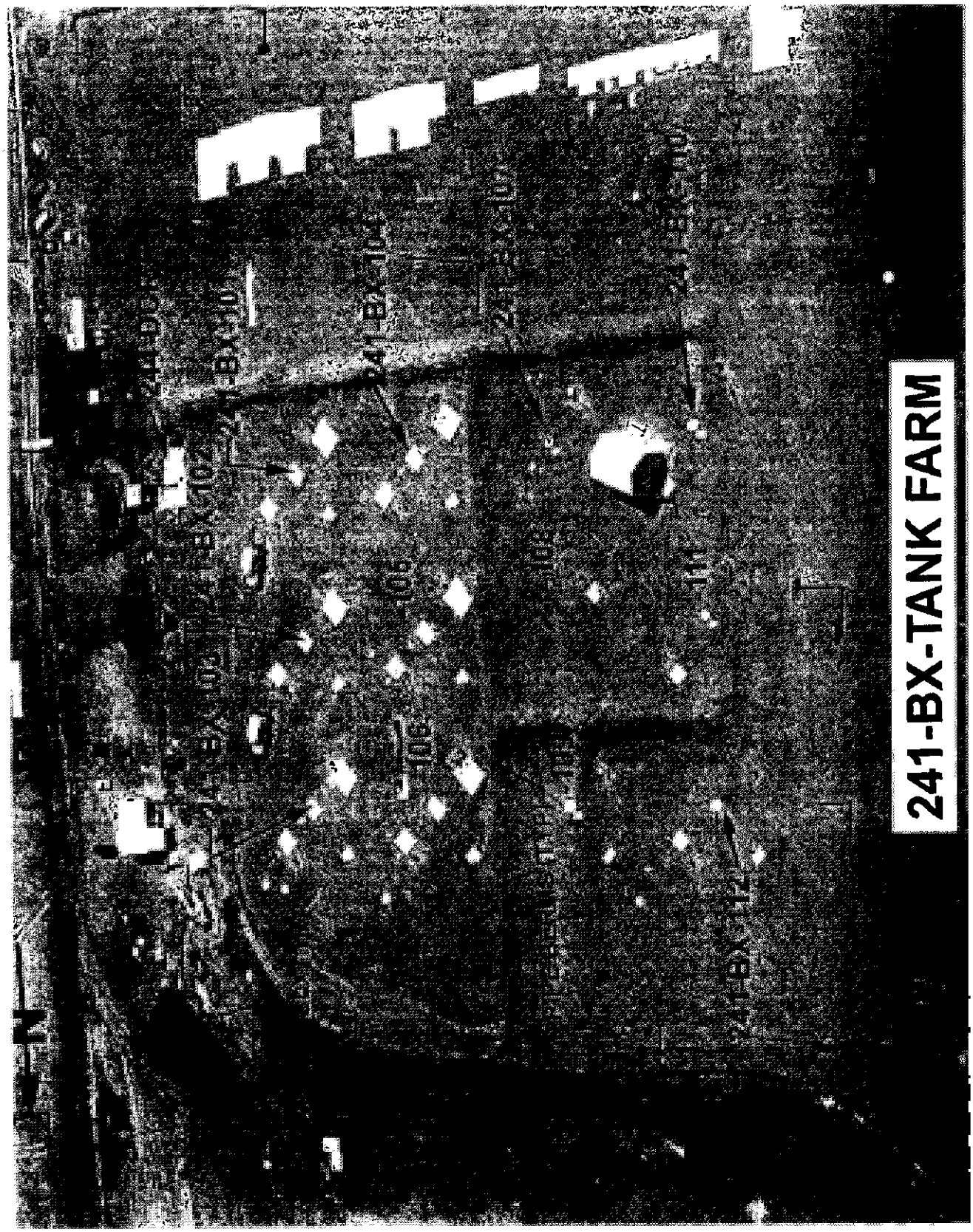
APPENDIX C

PHOTOS

242-A-EVAPORATOR
241-A-103
241-A-102
241-A-101
241-A-104
241-A-105
WELL CA
241-A-TANK-FARM

241-AX-TANK FARM
241-AX-101
241-AX-102
241-AX-103
241-AX-104
241-AX-FARM

241-B-204
PIPE BERMS (TYP)
241-B-20
-203
-112
-109
-106
-111
-108
-105
241-B-103
241-B-102
241-B-110
-107
-104
241-B-101
WELL CAP (Typ.
241-B-TANK FARM


241-BX-TANK FARM
N
241-BX-101
241-BX-102
241-BX-103
241-BX-104
241-BX-105
241-BX-106
241-BX-107
241-BX-108
241-BX-109
241-BX-110
241-BX-111
241-BX-112

241-BY-TANK FARM
241-BY-102
105
108
241-BY-101
241-BY-103
241-BY-104
241-BY-105
241-BY-106
241-BY-107
241-BY-108
241-BY-109
241-BY-110
241-BY-111
241-BY-112
241-BY-113
241-BY-114
241-BY-115
241-BY-116
241-BY-117
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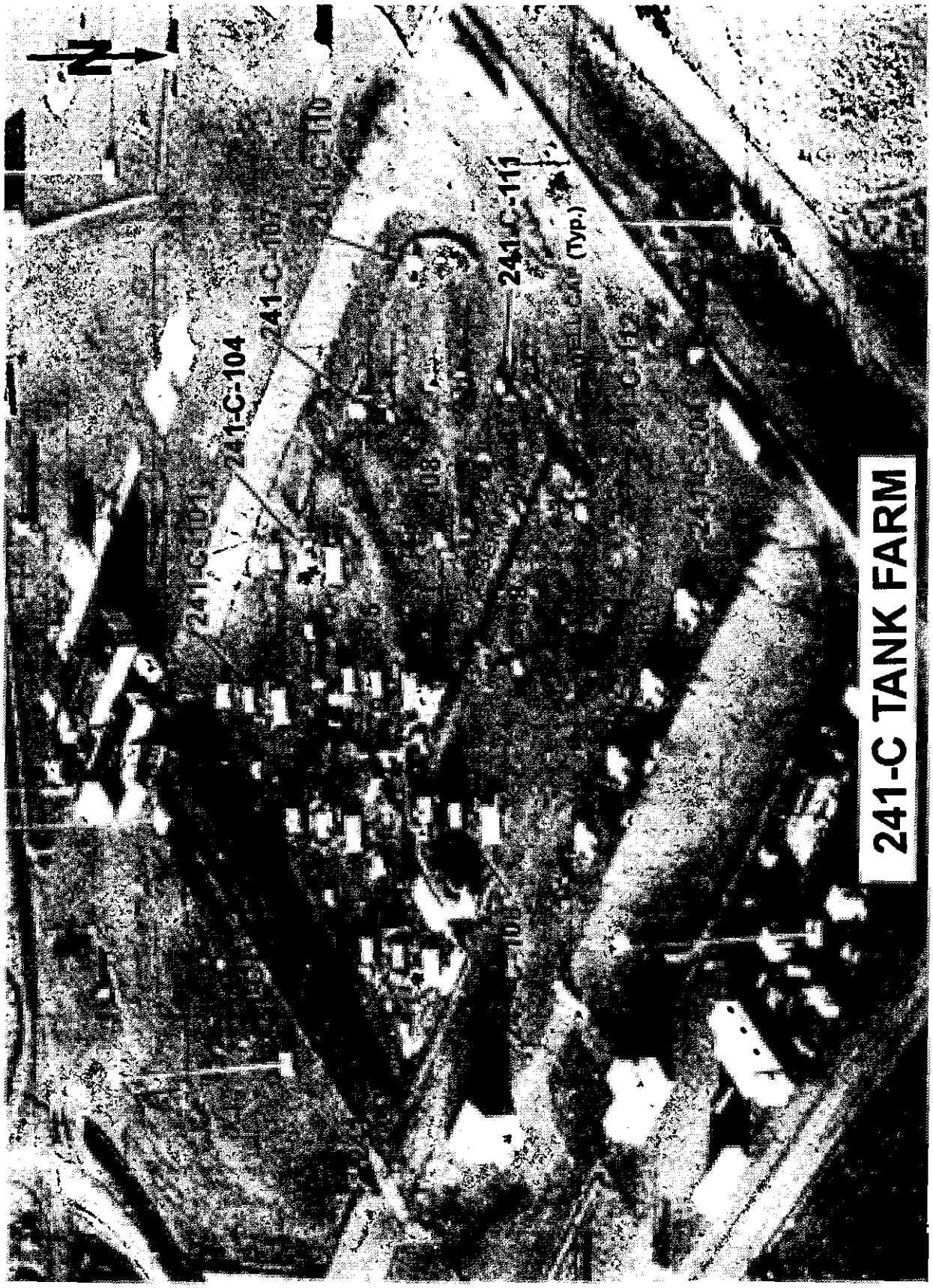
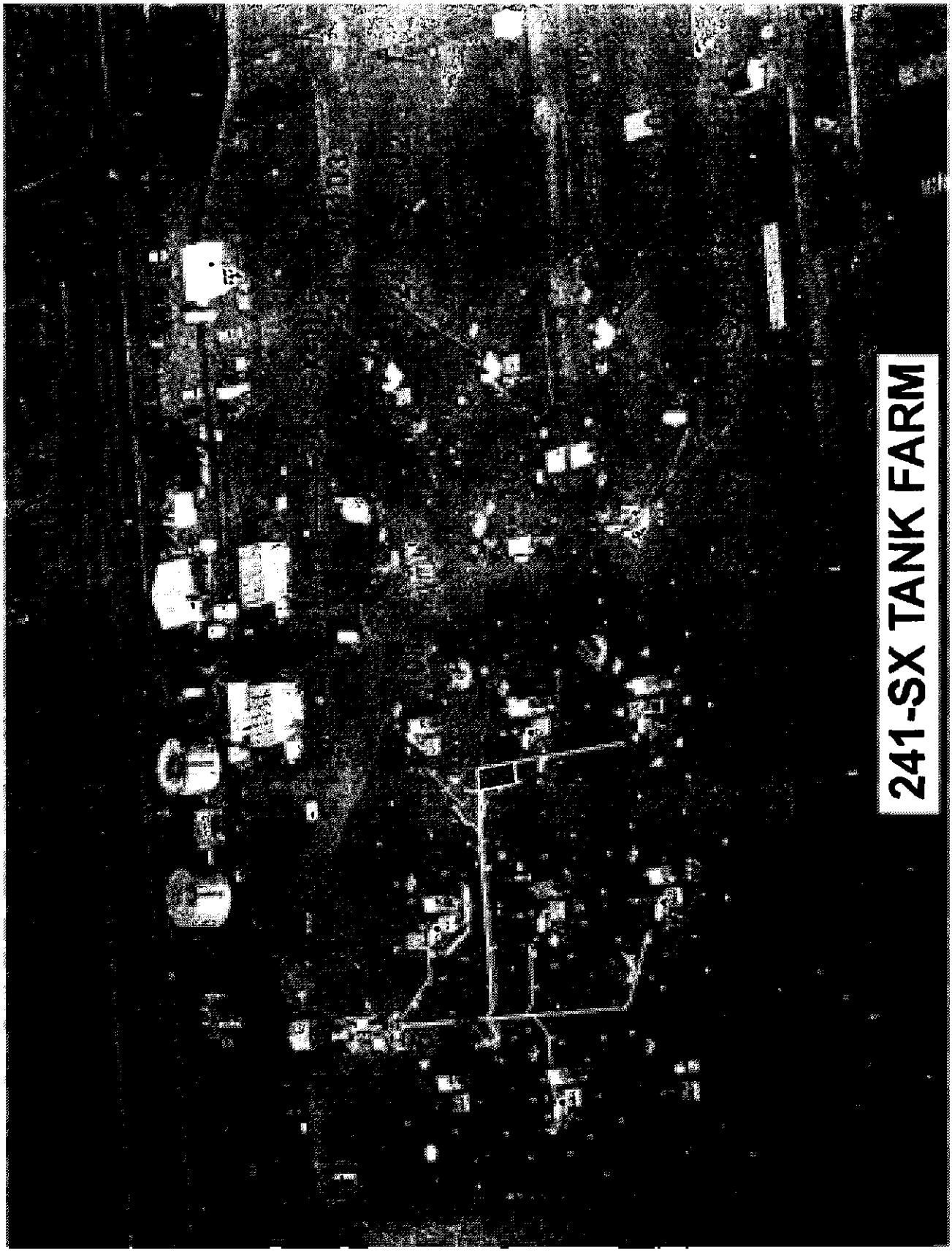
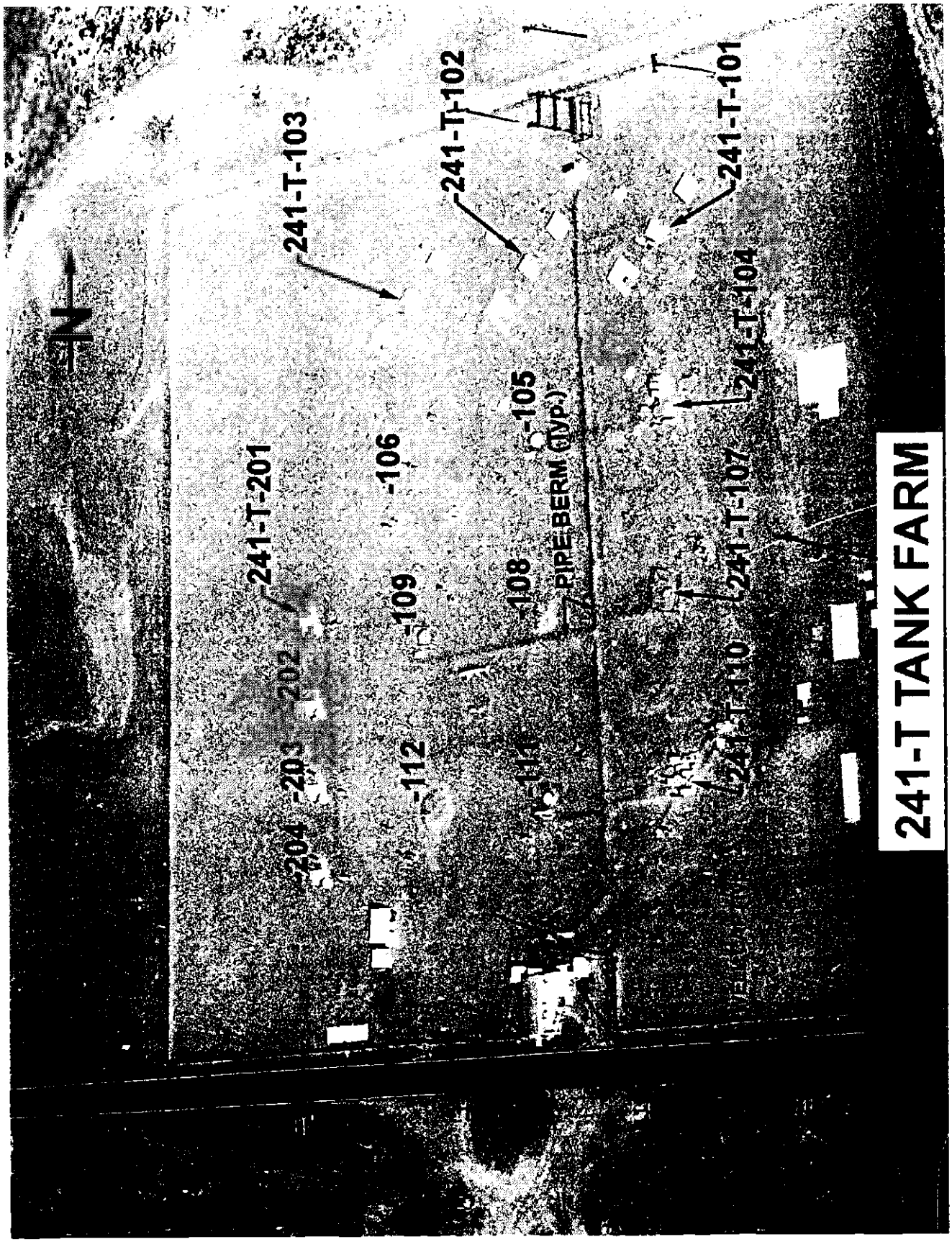
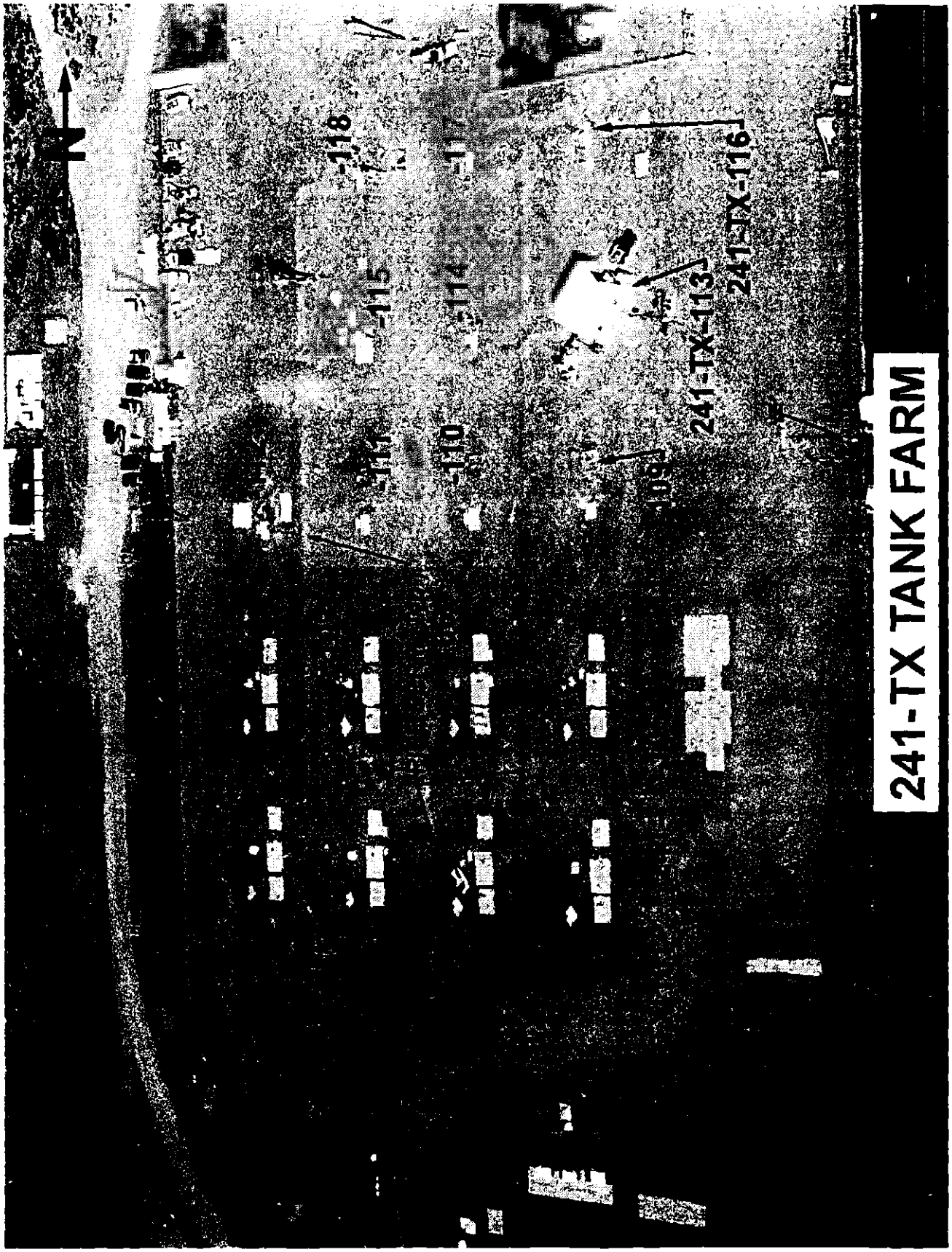
241-BY-141
241-BY-142

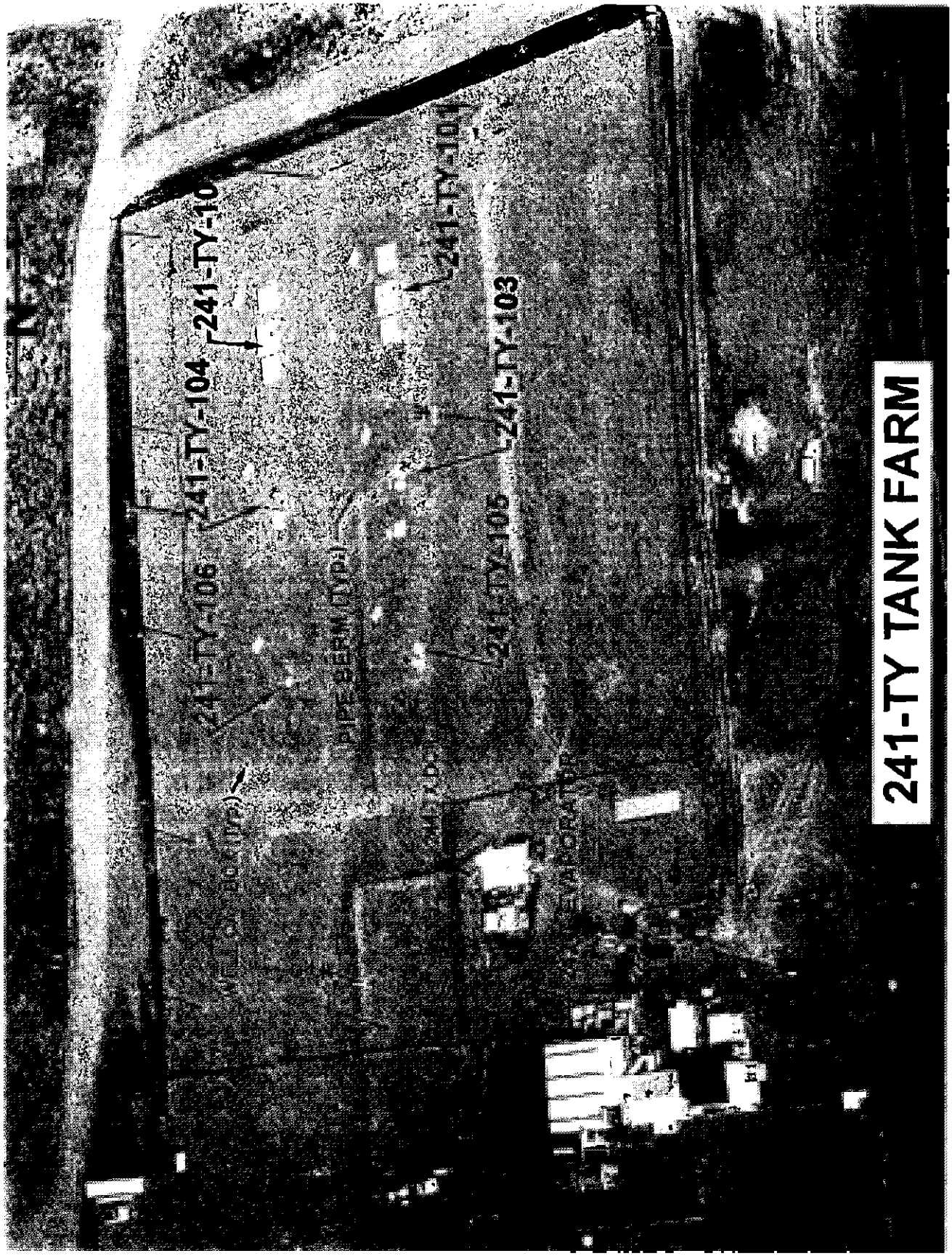

241-C TANK FARM
241-C-101
241-C-104
241-C-107
241-C-110
241-C-111
(Typ.)
N

241-S
EVAPORATOR
241-S TANK FARM


241-SX TANK FARM


241-T-103
241-T-102
241-T-101
241-T-104
241-T-201
-106
-105
PIPE BERM (TYP.)
-109
-108
241-T-107
-202
-203
-112
-110
241-T-110
-204
241-T TANK FARM


241-TX TANK FARM
N
-118
-117
-115
-114
-111
-110
-109
241-TX-113
241-TX-116

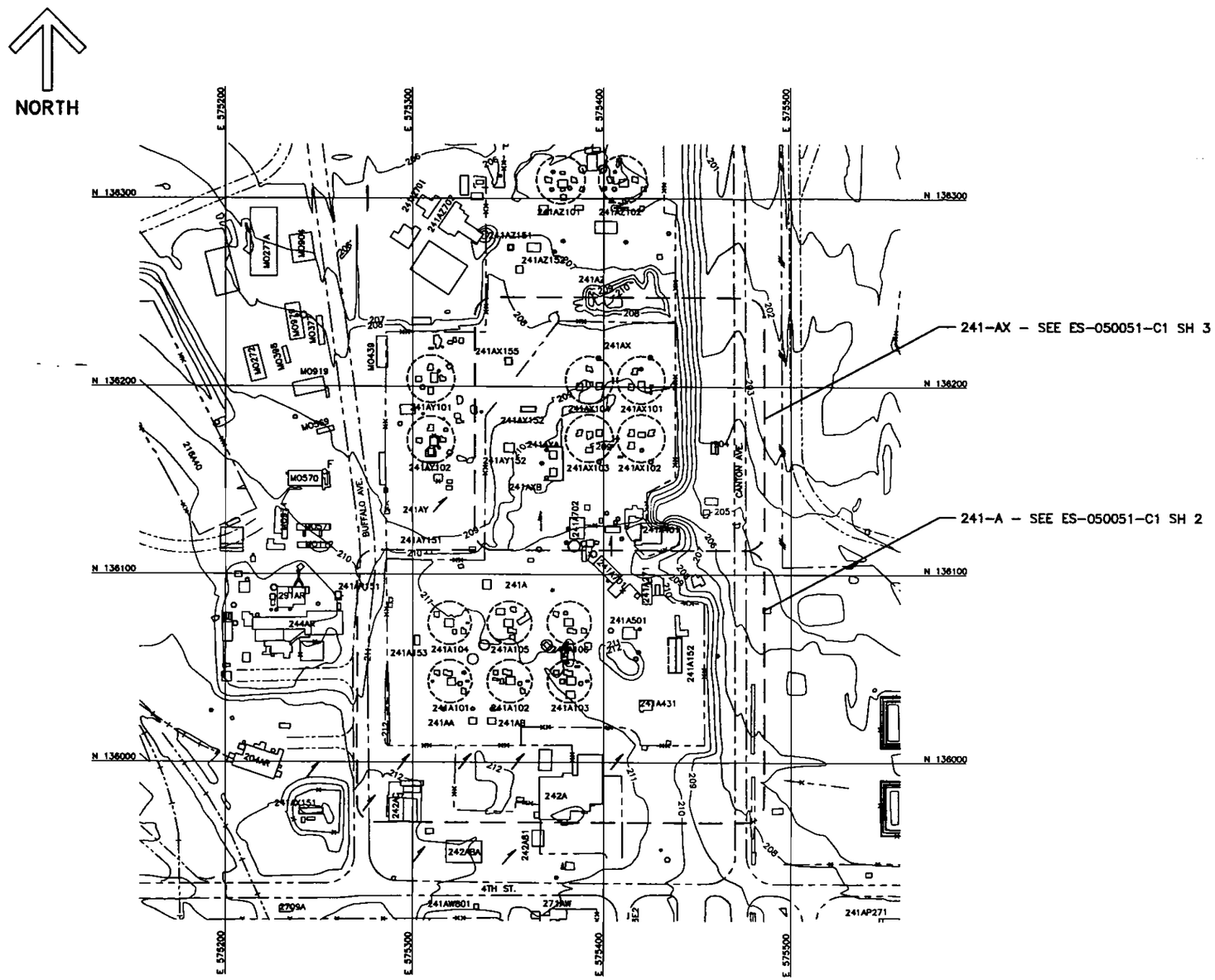

241-TY-106
241-TY-104
241-TY-10
241-TY-101
241-TY-103
241-TY-105
PIPE BERM (TYP.)
EVAPORATOR
241-TY TANK FARM

241-U TANK FARM

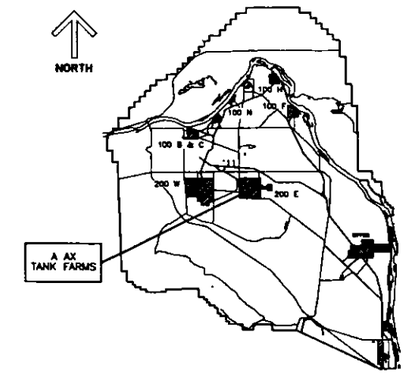
APPENDIX D

SKETCHES

RPP-5002,REV.1



A FARMS COMPLEX



HANFORD RESERVATION

LEGEND – EXISTING:

- UNDERGROUND WASTE TANK
- 204 EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- N 130000 GRID LINE (WCS83S91 METERS)
- 291AR BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- EXISTING FENCE
- OPEN ACCESS AREA
- GATE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REVISIONS

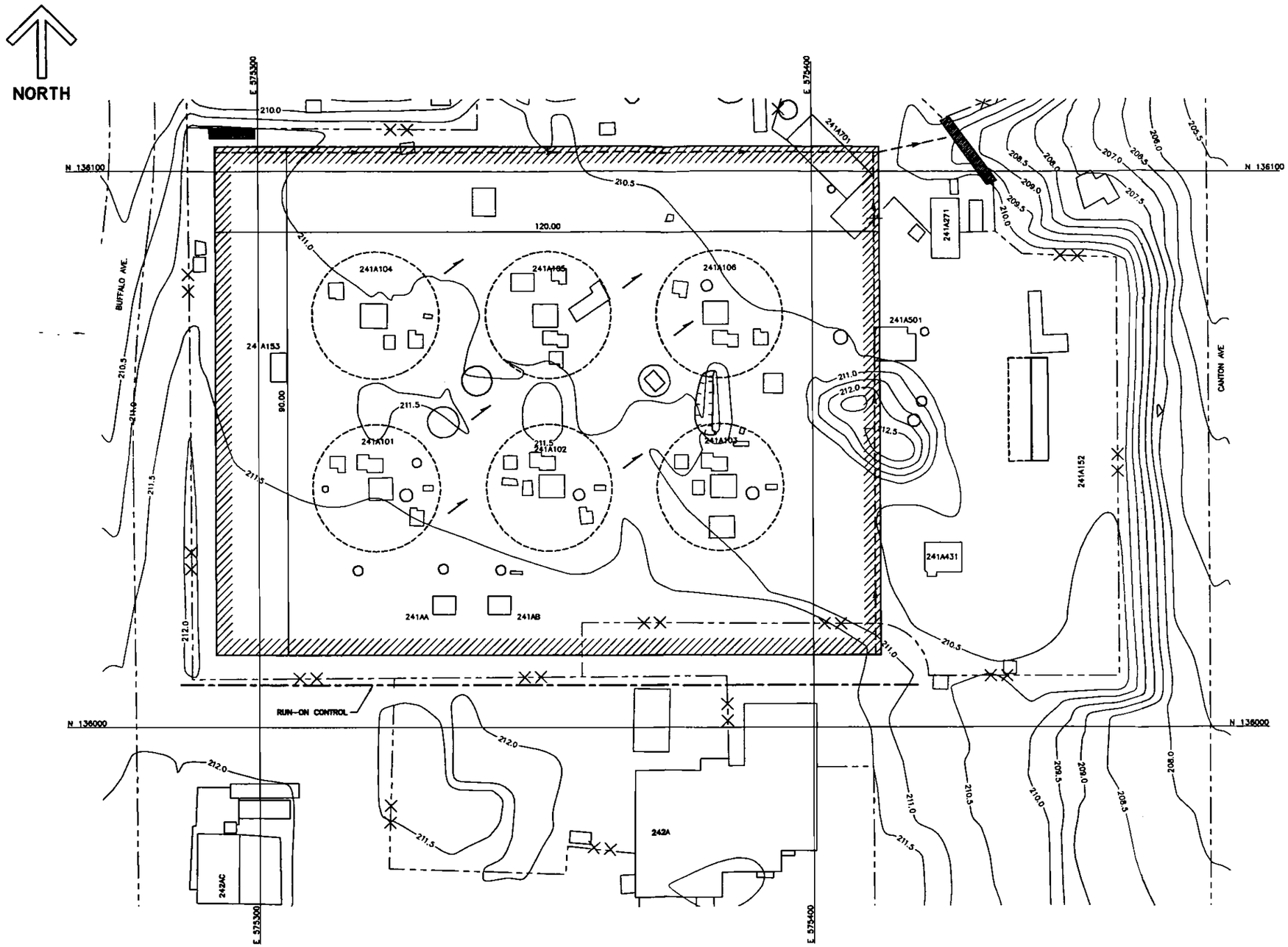
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/EVIRONMENTAL SURFACE WATER CONTROL A FARMS COMPLEX

F | 200E | 0100 | ES-050051-C1 | 0

SCALE 1:1000 | SHEET 1 OF



241-A TANK FARM

LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA — A ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — 1 ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — 2 ES-050051-C1 SH 19
- ℄ ASPHALT CURB — 3 ES-050051-C1 SH 19
- ℄ DRAIN TILE — 4 ES-050051-C1 SH 19
- CB CATCH BASIN AND CULVERT — 5 ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST	REFERENCES	NEXT USED ON	

REV NO	DESCRIPTION	DATE	BY
1	PER ENGINEER COMMENTS ADDED OPEN ACCESS AREAS	9/00	PRW

REVISIONS

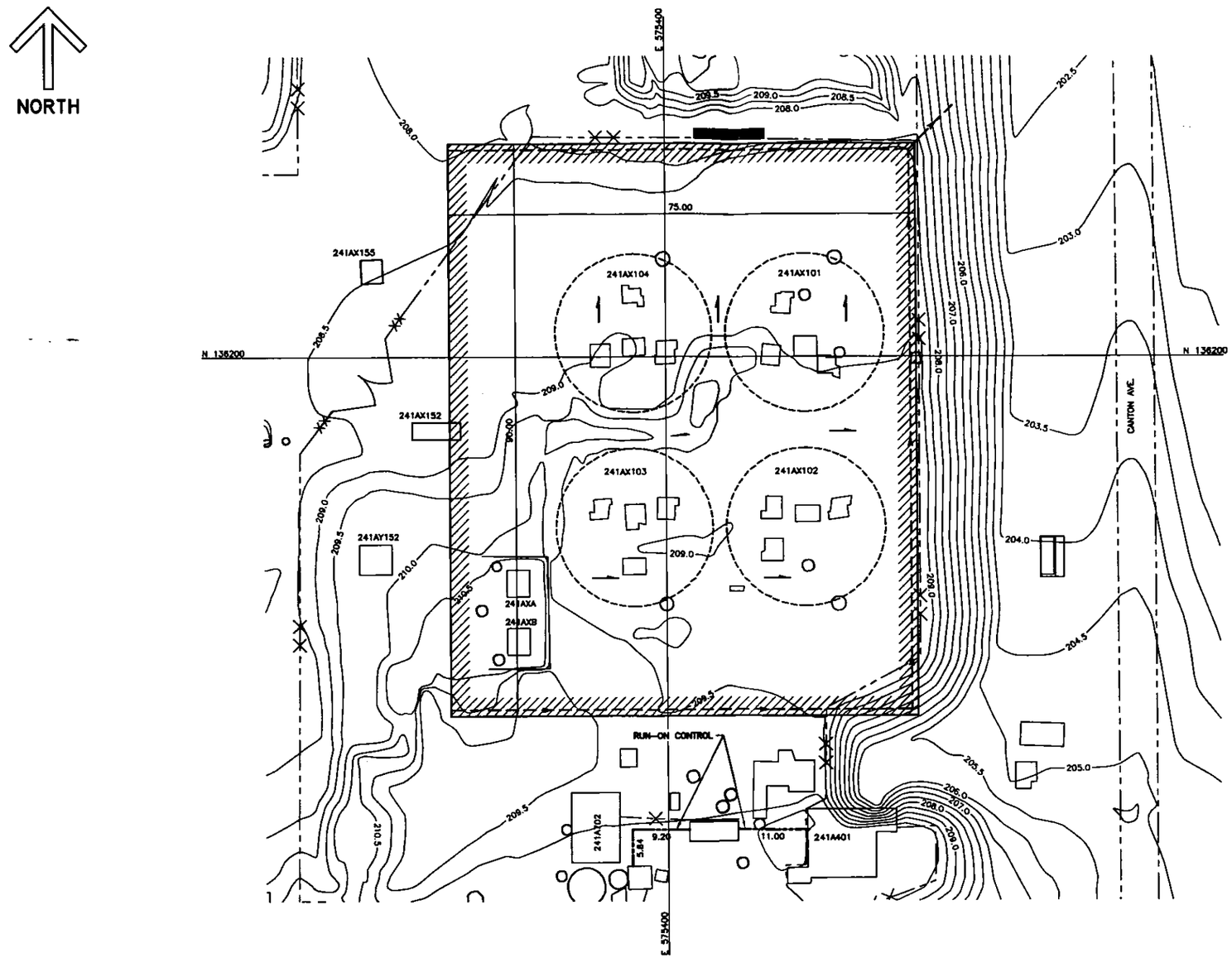
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-A TANK FARM

SIZE	SCALE CD	SHEET CD	DWG NO	REV
F	200E	0100	ES-050051-C1	1

SCALE 1:300 — SHEET 2 OF



241-AX TANK FARM

LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA (A ES-050051-C1 SH 19)
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM (1 ES-050051-C1 SH 19)
- ℄ DRAINAGE DITCH (2 ES-050051-C1 SH 19)
- ℄ ASPHALT CURB (3 ES-050051-C1 SH 19)
- ℄ DRAIN TILE (4 ES-050051-C1 SH 19)
- CB CATCH BASIN AND CULVERT (5 ES-050051-C1 SH 19)
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV NO	DESCRIPTION	BY	CHK
1	PER ENGINEER RED LINE ADDED OPEN ACCESS AREA & GATE	PRW 8/00	

REVISIONS

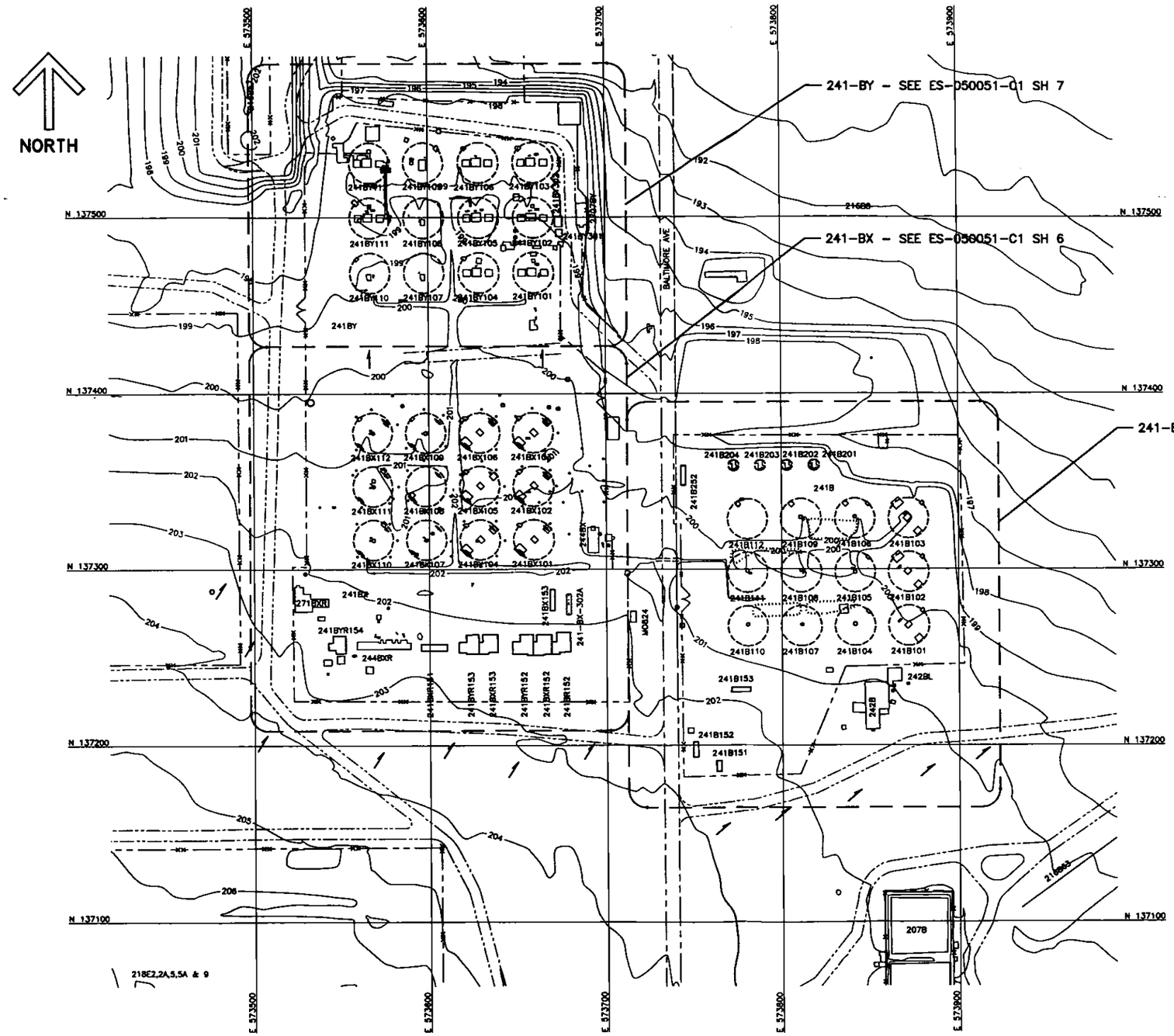
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

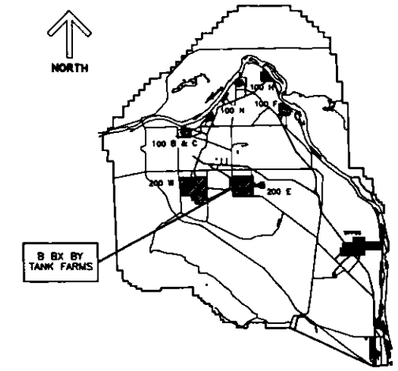
CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-AX TANK FARM

SIZE	FILE NO	SHEET NO	DWG NO	REV
F	200E	0100	ES-050051-C1	1

SCALE 1:300 SHEET 3 OF



B FARMS COMPLEX



HANFORD RESERVATION

LEGEND - EXISTING:

- UNDERGROUND WASTE TANK
- 204 EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- N 130000 GRID LINE (WCS83S91 METERS)
- 291AR BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- EXISTING FENCE
- OPEN ACCESS AREA
- GATE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REVISIONS

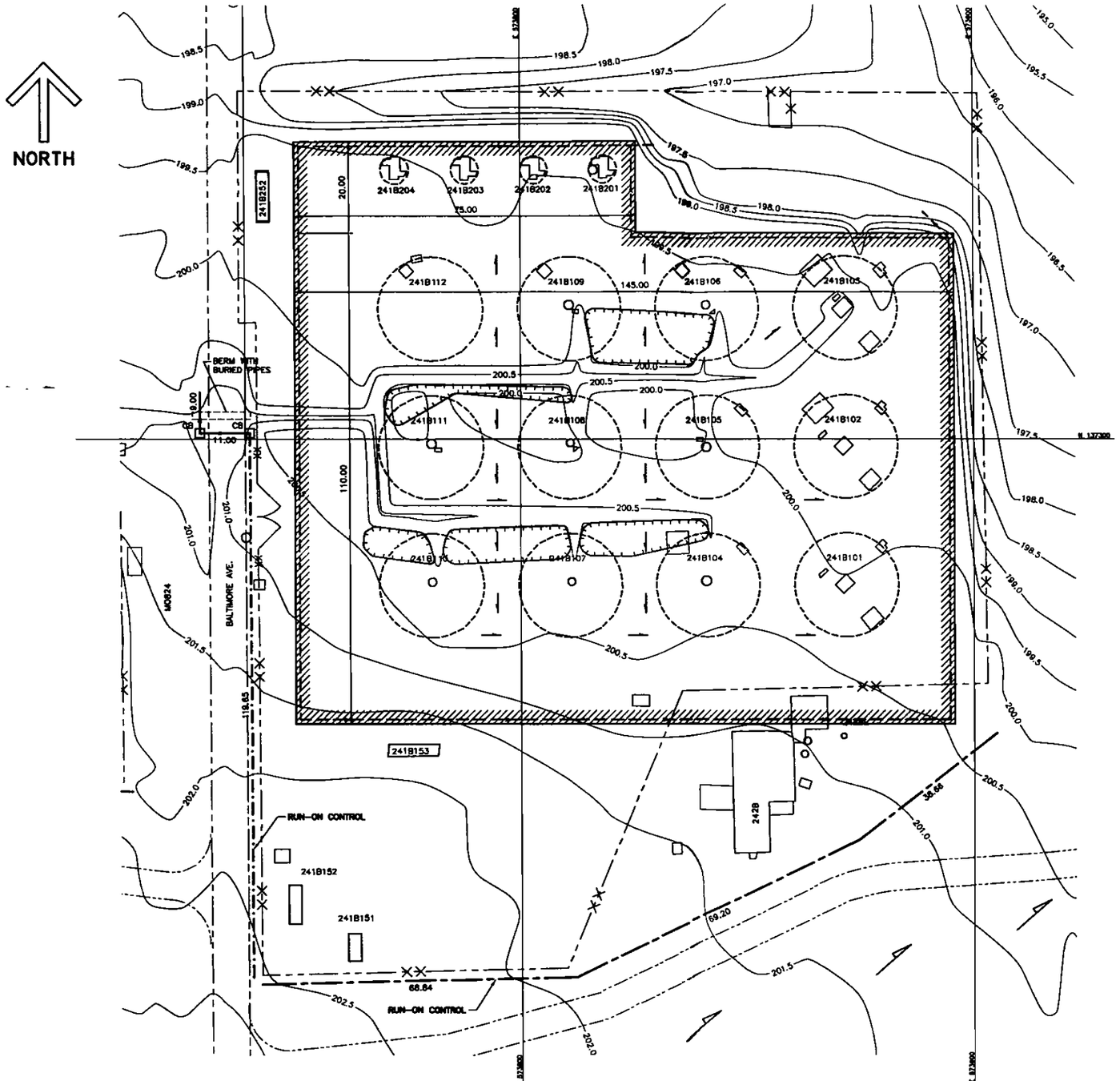
NAME	DATE
DJ WHITISH	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
B FARMS COMPLEX

REV	BLDG NO	DWG NO	REV
F	200E	0100	ES-050051-C1	0

SCALE 1:1000 SHEET 4 OF



241-B TANK FARM

LEGEND -- PROPOSED:

- SURFACE WATER CONTROL AREA — A ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — 1 ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — 2 ES-050051-C1 SH 19
- ℄ ASPHALT CURB — 3 ES-050051-C1 SH 19
- ℄ DRAIN TILE — 4 ES-050051-C1 SH 19
- CB — CATCH BASIN AND CULVERT — 5 ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV	DESCRIPTION	DATE	BY
1	COMMENTS ADDED GATE PER ENGINEER	9/00	PHW

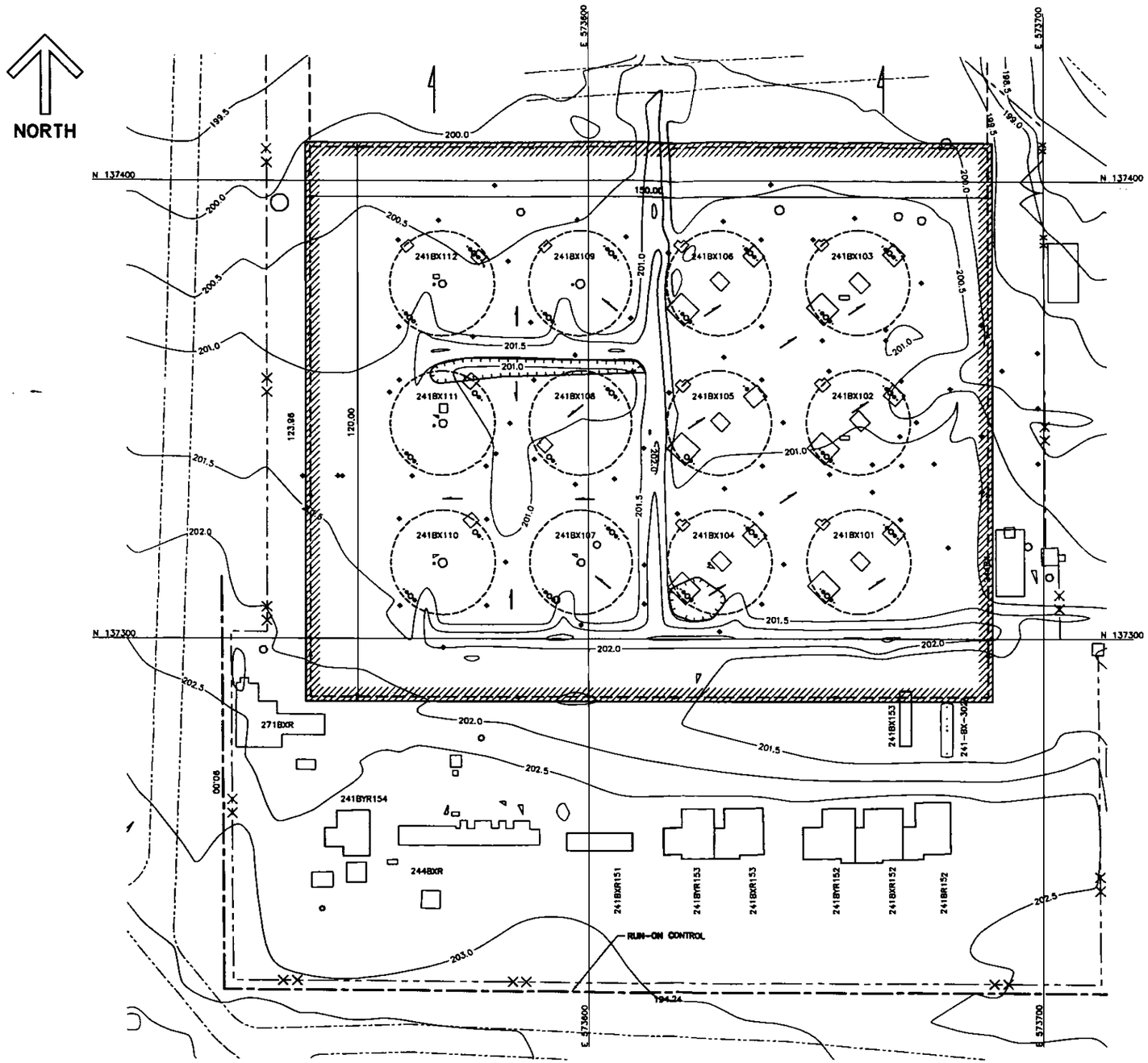
REVISIONS

NAME: CJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-B TANK FARM

SIZE F | BLDG NO 200E | PROJ NO 0100 | DWG NO ES-050051-C1 | REV 1
SCALE 1:400 | SHEET 5 OF



LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA — A ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — 1 ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — 2 ES-050051-C1 SH 19
- ℄ ASPHALT CURB — 3 ES-050051-C1 SH 19
- ℄ DRAIN TILE — 4 ES-050051-C1 SH 19
- CB — CATCH BASIN AND CULVERT — 5 ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

241-BX TANK FARM

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV NO	DESCRIPTION	PREW 6/98
1	ADDED GATE PER ENGR COMMENTS	

REVISIONS

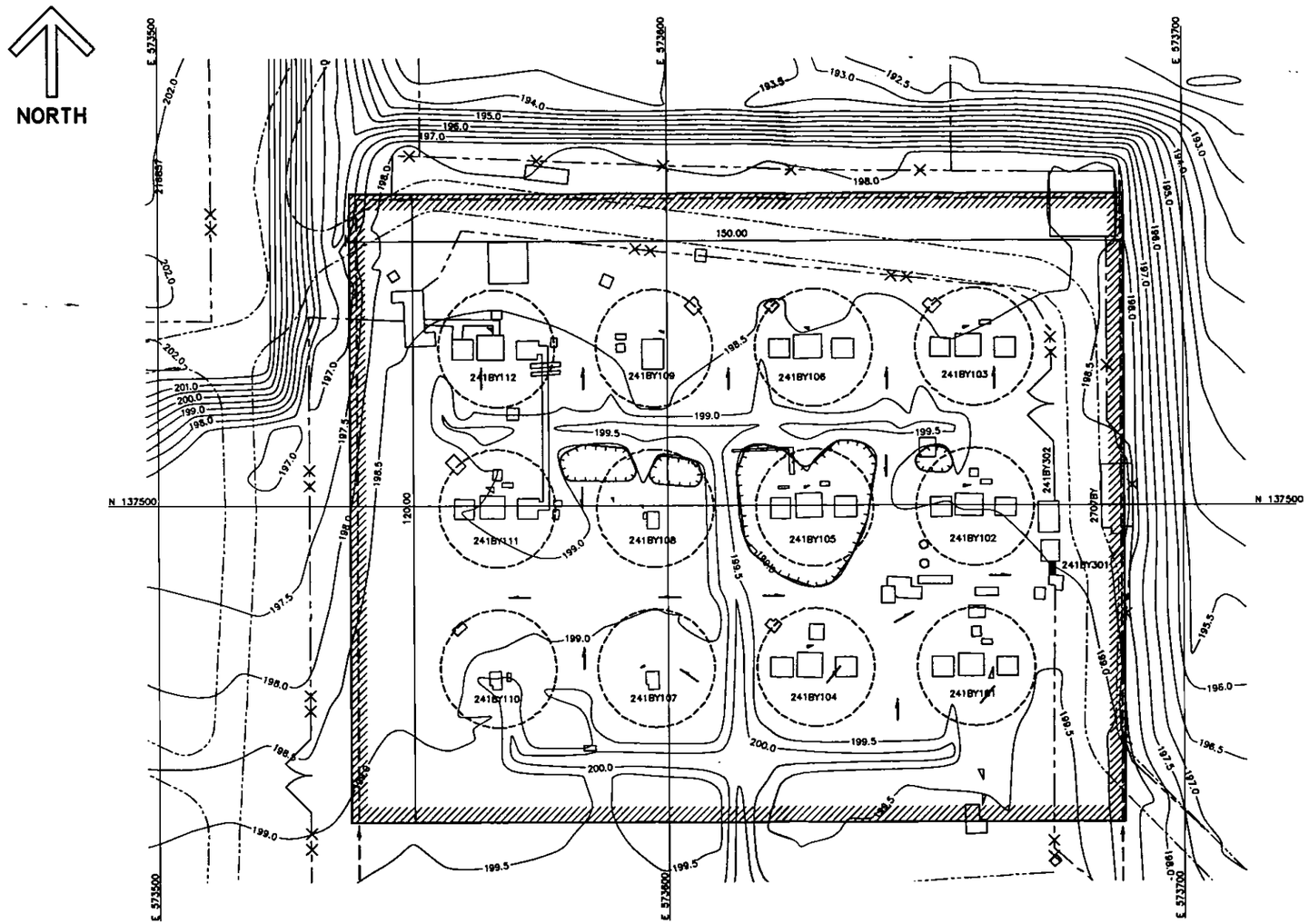
NAME: D.J. WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-BX TANK FARM

F | 200E | 0100 | ES-050051-C1 | 1

SCALE 1:400 | SHEET 6 OF



241-BY TANK FARM

LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA — A ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — 1 ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — 2 ES-050051-C1 SH 19
- ℄ ASPHALT CURB — 3 ES-050051-C1 SH 19
- ℄ DRAIN TILE — 4 ES-050051-C1 SH 19
- CB CATCH BASIN AND CULVERT — 5 ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REV NO	DESCRIPTION	DATE	DWN	CHK
1	ADDED GATE PER ENGR COMMENTS	5/00		

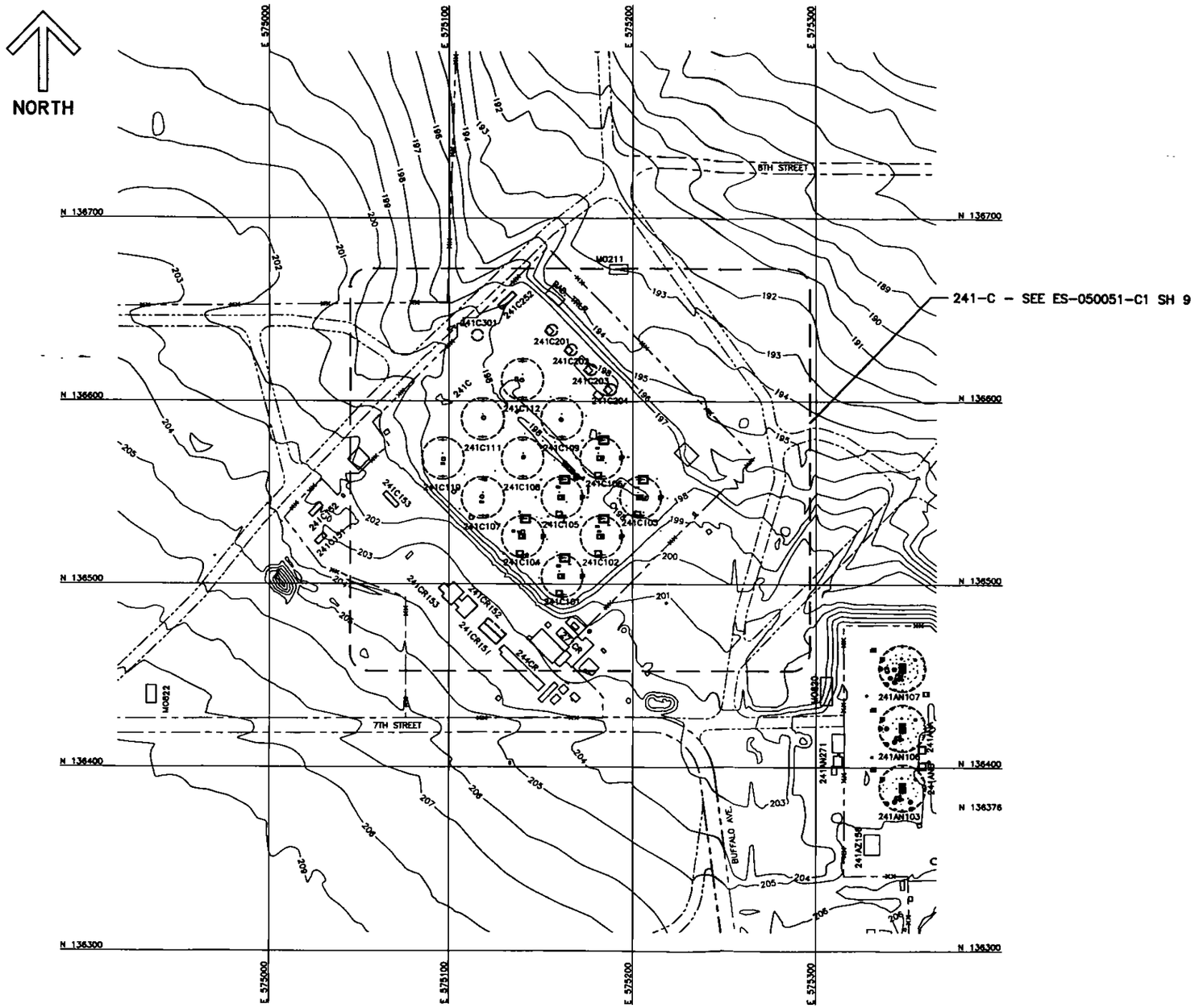
REVISIONS

NAME: DJ WHITISH

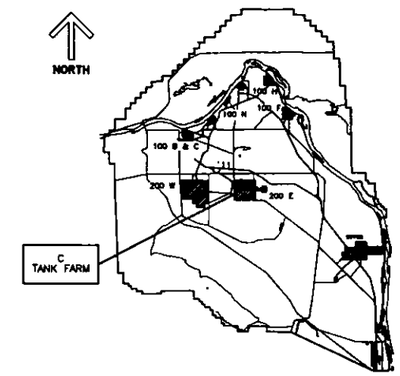
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-BY TANK FARM

SIZE F | SCALE 1:400 | DWG NO ES-050051-C1 | REV 1 | SHEET 7 OF



C FARM COMPLEX



HANFORD RESERVATION

LEGEND – EXISTING:

- UNDERGROUND WASTE TANK
- 204 EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- N 130000 GRID LINE (WCS83S91 METERS)
- 291AR BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- EXISTING FENCE
- OPEN ACCESS AREA
- GATE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REVISIONS

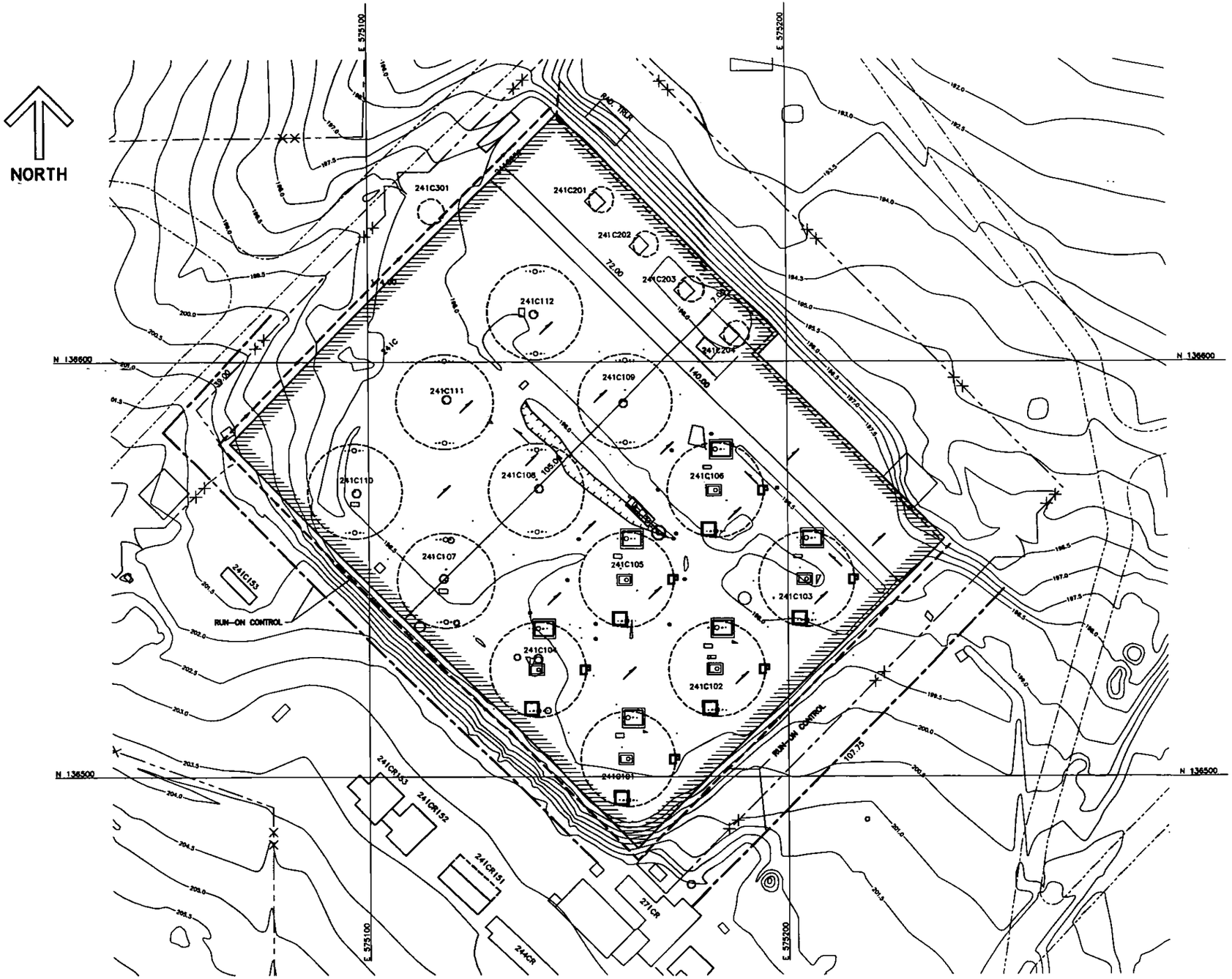
NAME	
DJ WHITISH	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
C FARM COMPLEX

SIZE	CLASS NO	VARIC NO	DWG NO	REV
F	200E	0100	ES-050051-C1	0

SCALE 1:1000 SHEET 8 OF



241-C TANK FARM

LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA — A ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — 1 ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — 2 ES-050051-C1 SH 19
- ℄ ASPHALT CURB — 3 ES-050051-C1 SH 19
- ℄ DRAIN TILE — 4 ES-050051-C1 SH 19
- CB — CATCH BASIN AND CULVERT — 5 ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV	DESCRIPTION		
1	ADDED GATES PER ENGR COMMENTS	PRW 9/00	
	REVISIONS		

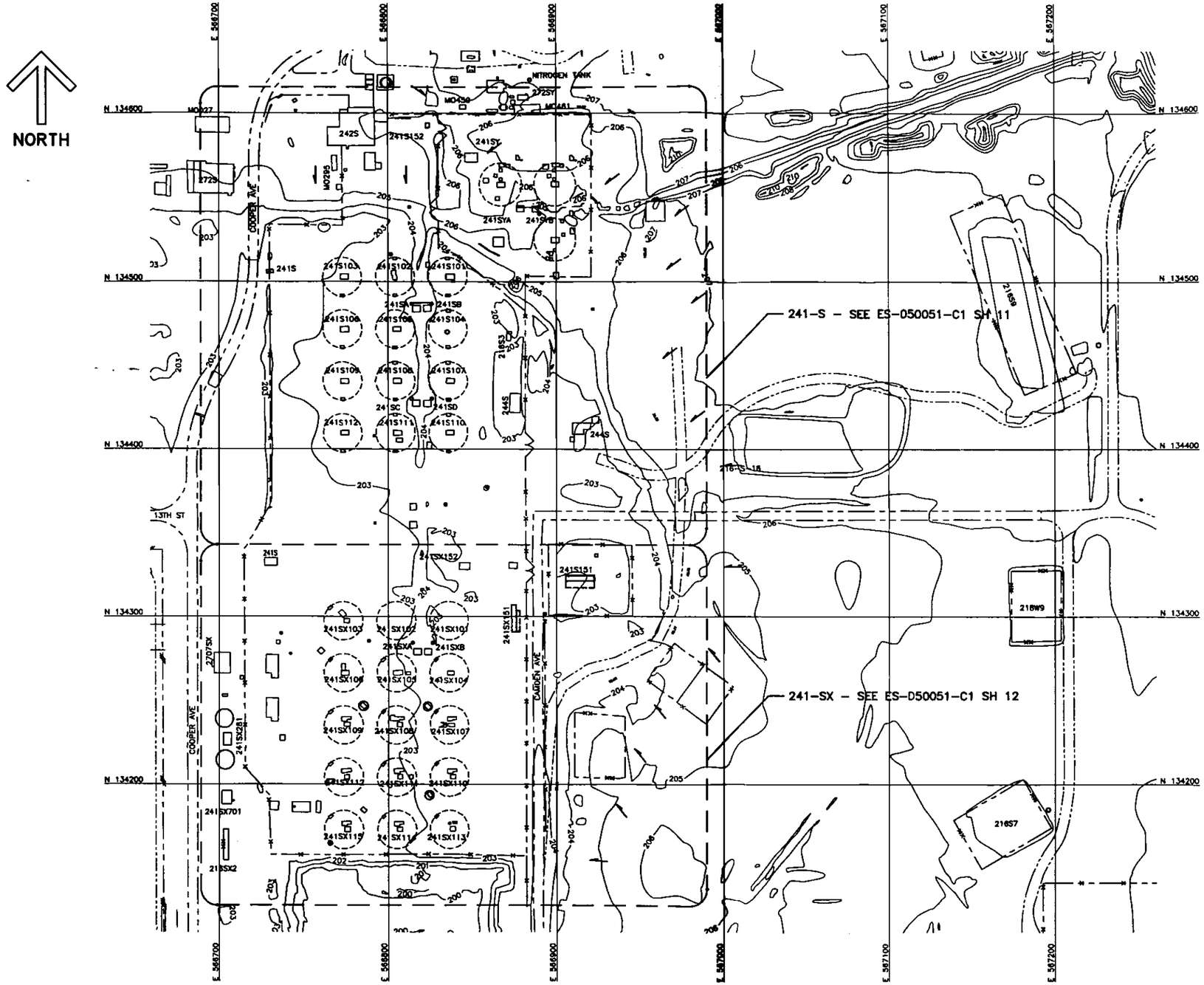
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

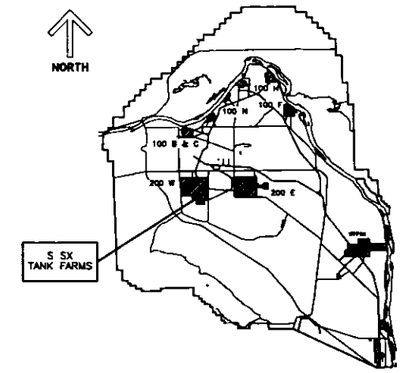
CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-C TANK FARM

SIZE F | 200E | 0100 | ES-050051-C1 | REV 1

SCALE 1:400 | SHEET 9 OF



S FARM COMPLEX



HANFORD RESERVATION

LEGEND – EXISTING:

- UNDERGROUND WASTE TANK
- 204 EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- N 130000 GRID LINE (WCS83S91 METERS)
- 291AR BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- EXISTING FENCE
- OPEN ACCESS AREA
- GATE

DRAWING TRACEABILITY LIST		REFERENCES		REVISIONS	
DWG NO	TITLE	REF NUMBER	TITLE	REV NO	DESCRIPTION

NEXT USED ON

NAME: DJ WHITISH

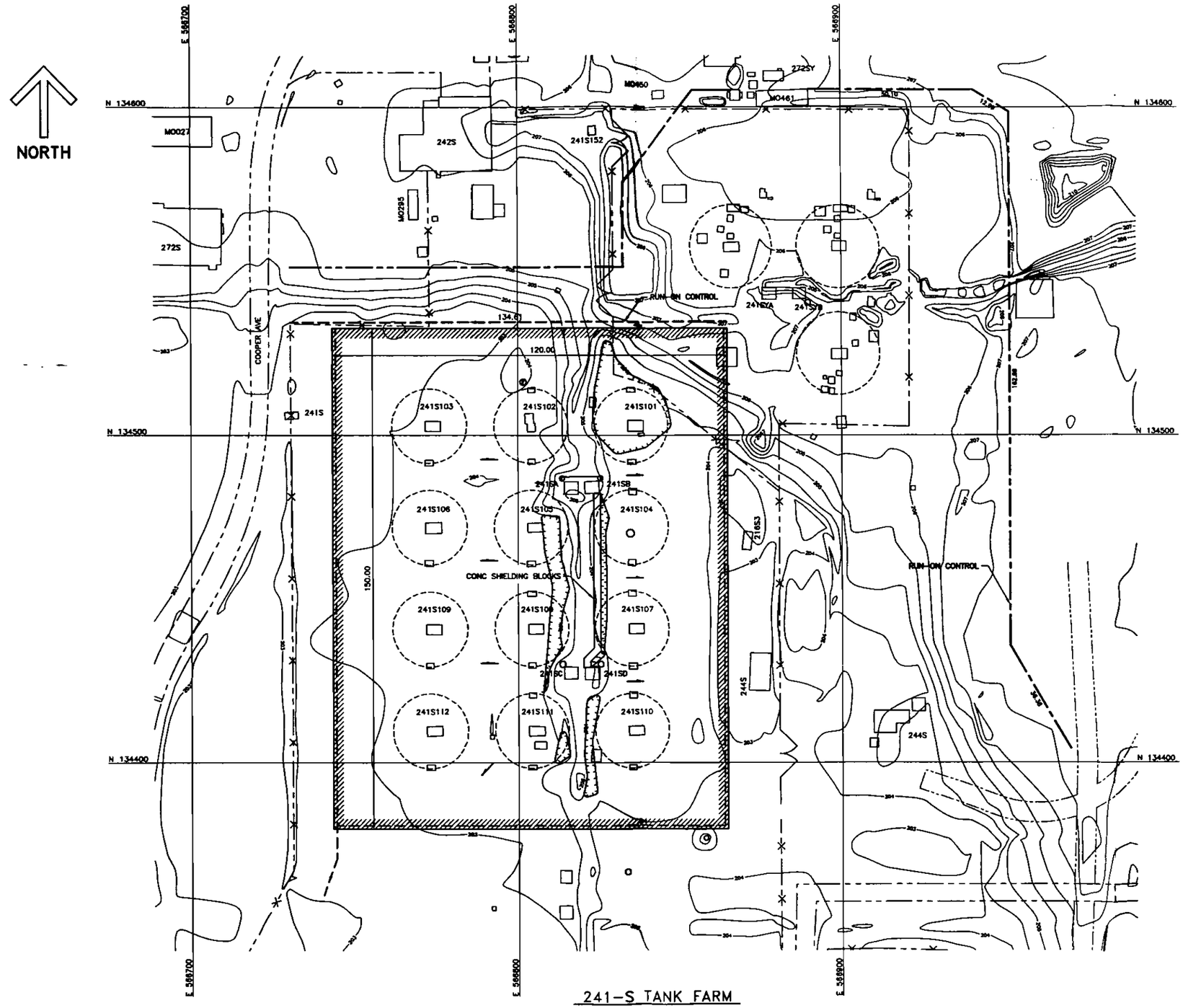
U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
S FARM COMPLEX

SIZE	BLDG NO	SHEET NO	DWG NO	REV
F	200E	0100	ES-050051-C1	0

SCALE 1:1000 SHEET 10 OF

RPP-5002,REV.1



LEGEND – PROPOSED:

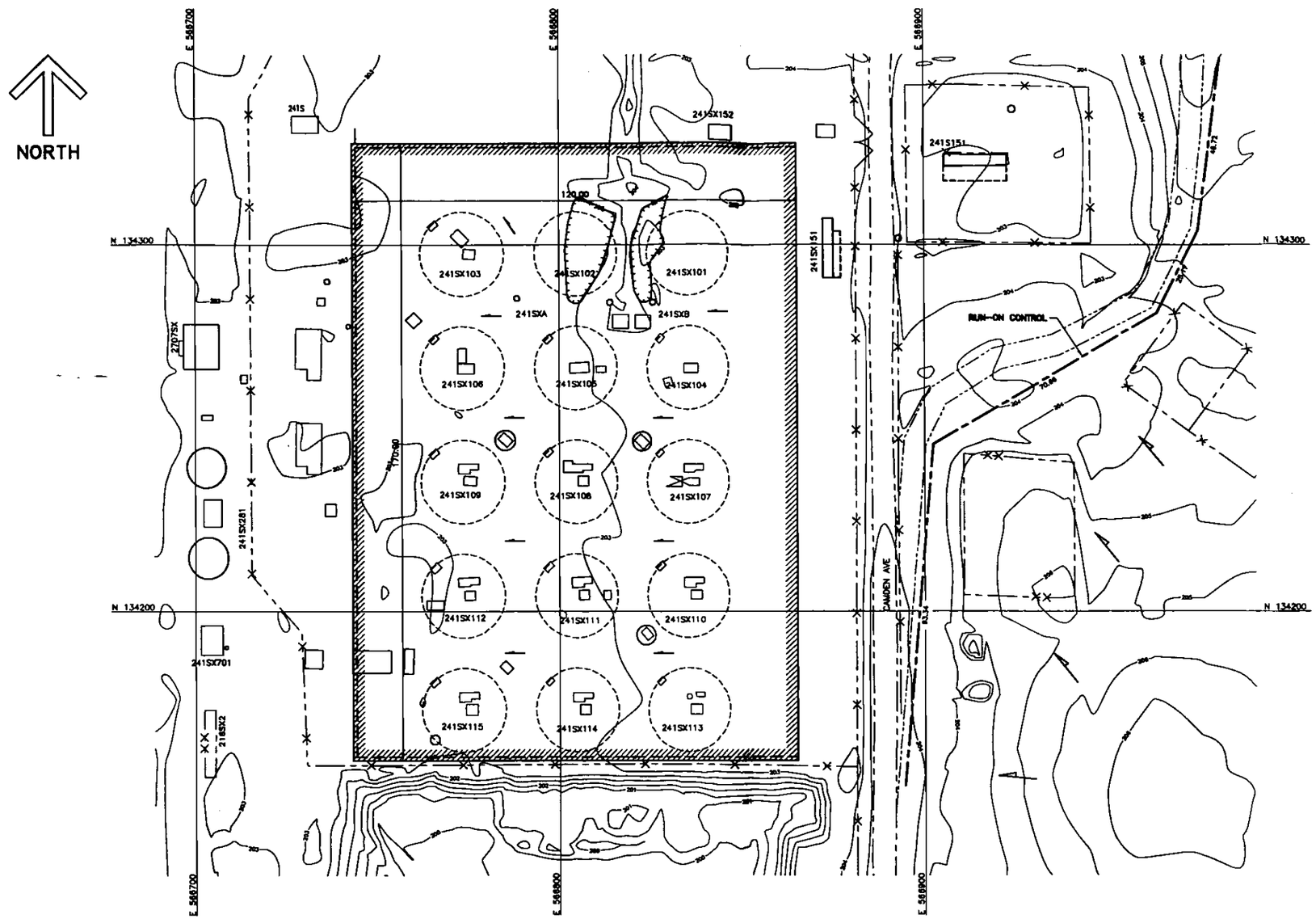
- SURFACE WATER CONTROL AREA — (A) ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — (1) ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — (2) ES-050051-C1 SH 19
- ℄ ASPHALT CURB — (3) ES-050051-C1 SH 19
- ℄ DRAIN TILE — (4) ES-050051-C1 SH 19
- CB — CATCH BASIN AND CULVERT — (5) ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

241-S TANK FARM

DRAWING TRACEABILITY LIST			
DWG NO	TITLE	REF NUMBER	TITLE
		REFERENCES	
		NEXT USED ON	

REVISIONS			
1	ADDED GATES PER ENGR COMMENTS	PRW 9/00	

NAME	U.S. DEPARTMENT OF ENERGY, Richland Operations Office
DJ WHITISH	CIVIL/ENVIRONMENTAL SURFACE WATER CONTROL 241-S TANK FARM
SIZE F	200W 0100 ES-050051-C1 REV 1
SCALE 1:500	SHEET 11 OF



241-SX TANK FARM

LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA (A ES-050051-C1 SH 19)
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM (1 ES-050051-C1 SH 19)
- ℄ DRAINAGE DITCH (2 ES-050051-C1 SH 19)
- ℄ ASPHALT CURB (3 ES-050051-C1 SH 19)
- ℄ DRAIN TILE (4 ES-050051-C1 SH 19)
- CB CATCH BASIN AND CULVERT (5 ES-050051-C1 SH 19)
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV	DATE	DESCRIPTION	BY/DATE
1		ADDED GATES PER ENGR COMMENTS	PRW 9/03

REVISIONS

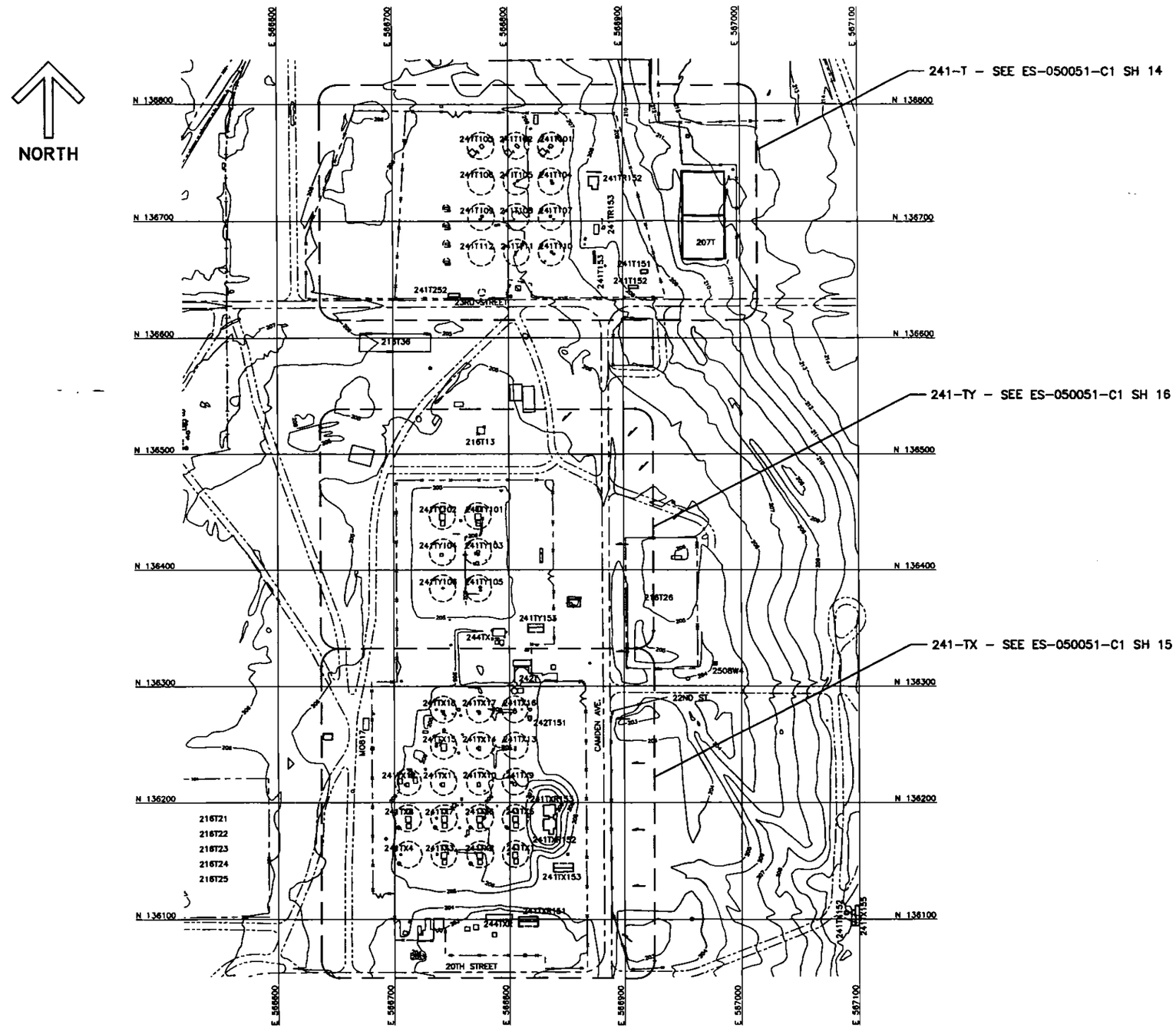
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

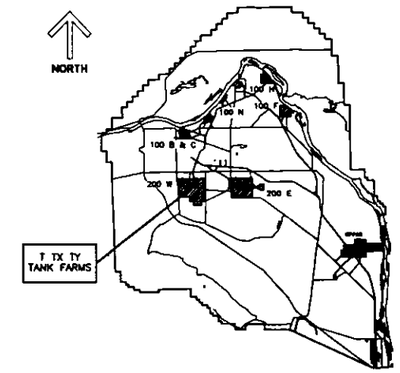
CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-SX TANK FARM

F | 200W | 0100 | ES-050051-C1 | 1

SCALE 1:500 | SHEET 12



T FARM COMPLEX



HANFORD RESERVATION

LEGEND – EXISTING:

- UNDERGROUND WASTE TANK
- 204 EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- N 130000 GRID LINE (WCS83S91 METERS)
- 291AR BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- EXISTING FENCE
- OPEN ACCESS AREA
- GATE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
NEXT USED ON	REFERENCES

REVISIONS

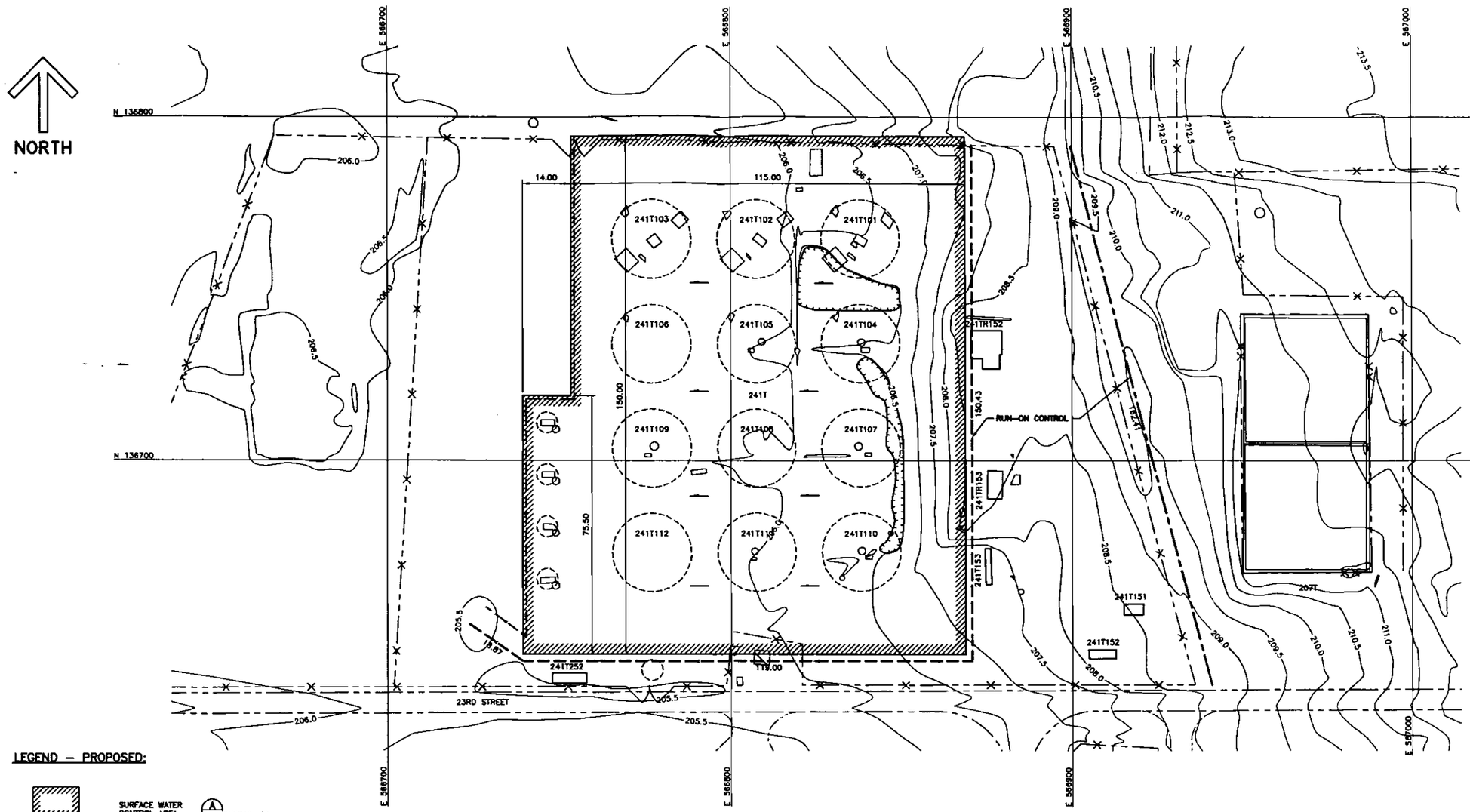
NAME	DATE
DW WHITISH	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
T FARMS COMPLEX

SIZE	BLDG NO	PAGE NO	DWG NO	REV
F	200E	0100	ES-050051-C1	0

SCALE 1:1500 SHEET 13 OF



241-T TANK FARM

LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA (A ES-050051-C1 SH 19)
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM (1 ES-050051-C1 SH 19)
- ℄ DRAINAGE DITCH (2 ES-050051-C1 SH 19)
- ℄ ASPHALT CURB (3 ES-050051-C1 SH 19)
- ℄ DRAIN TILE (4 ES-050051-C1 SH 19)
- CB CATCH BASIN AND CULVERT (5 ES-050051-C1 SH 19)
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REVISIONS

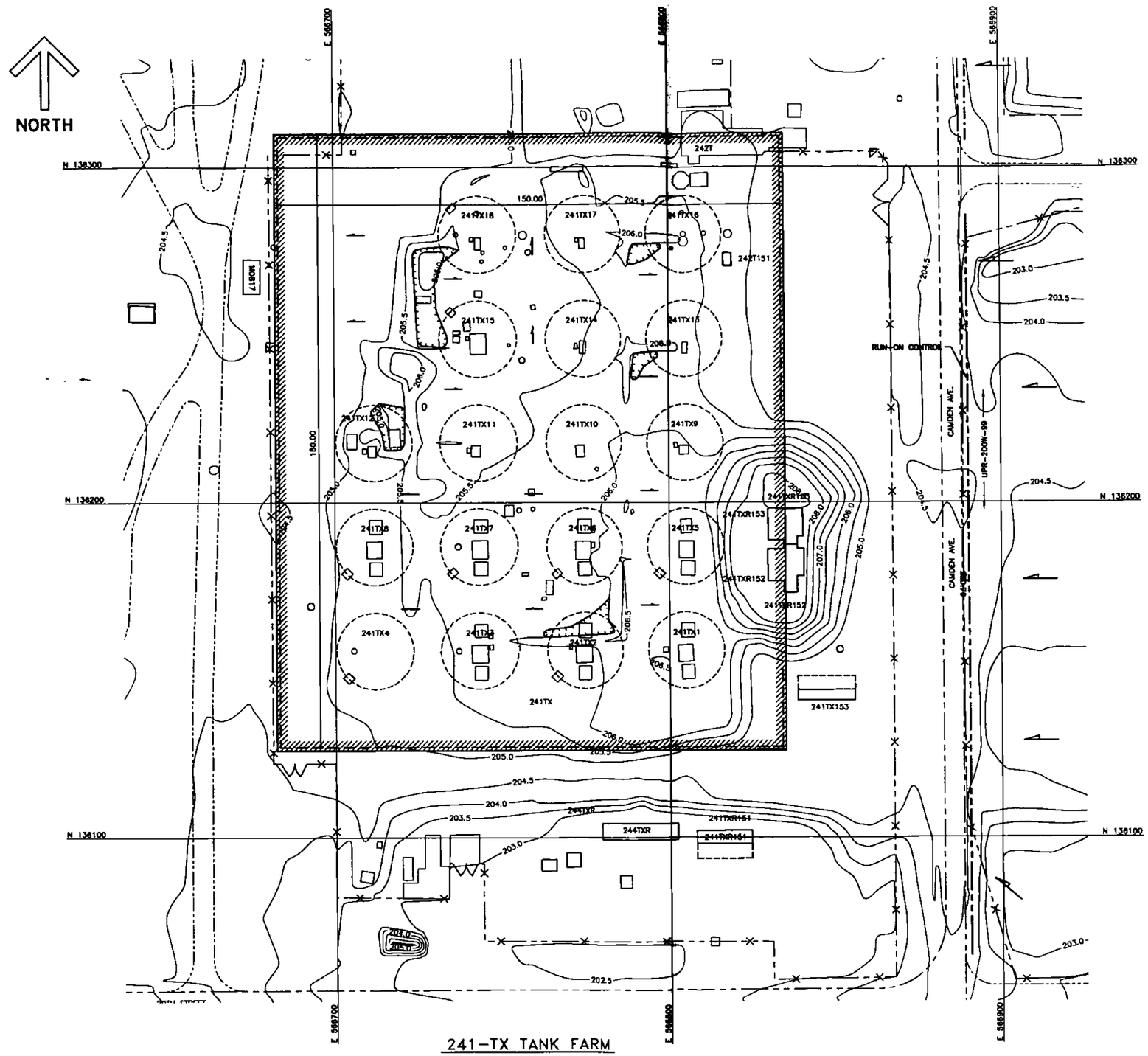
NAME	
DRAWN BY W. WHITISH	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-T TANK FARM

SIZE	BLDG NO	SHEET NO	DWG NO	REV
F	200W	0100	ES-050051-C1	0

SCALE 1:500 SHEET 14 OF



241-TX TANK FARM

LEGEND - PROPOSED:

	SURFACE WATER CONTROL AREA	A ES-050051-C1 SH 19
	SURFACE DRAINAGE DIRECTION	
	SURFACE WATER COLLECTION AREA	
	℄ BERM	1 ES-050051-C1 SH 19
	℄ DRAINAGE DITCH	2 ES-050051-C1 SH 19
	℄ ASPHALT CURB	3 ES-050051-C1 SH 19
	℄ DRAIN TILE	4 ES-050051-C1 SH 19
CB	CATCH BASIN AND CULVERT	5 ES-050051-C1 SH 19
	OPEN ACCESS AREA	
	GATE	
	EXISTING FENCE	

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		REFERENCES	
		NEXT USED ON	

REV NO	DESCRIPTION	REV BY DATE
1	ADDED GATES PER ENGR COMMENTS	PRW 9/00
	REVISIONS	

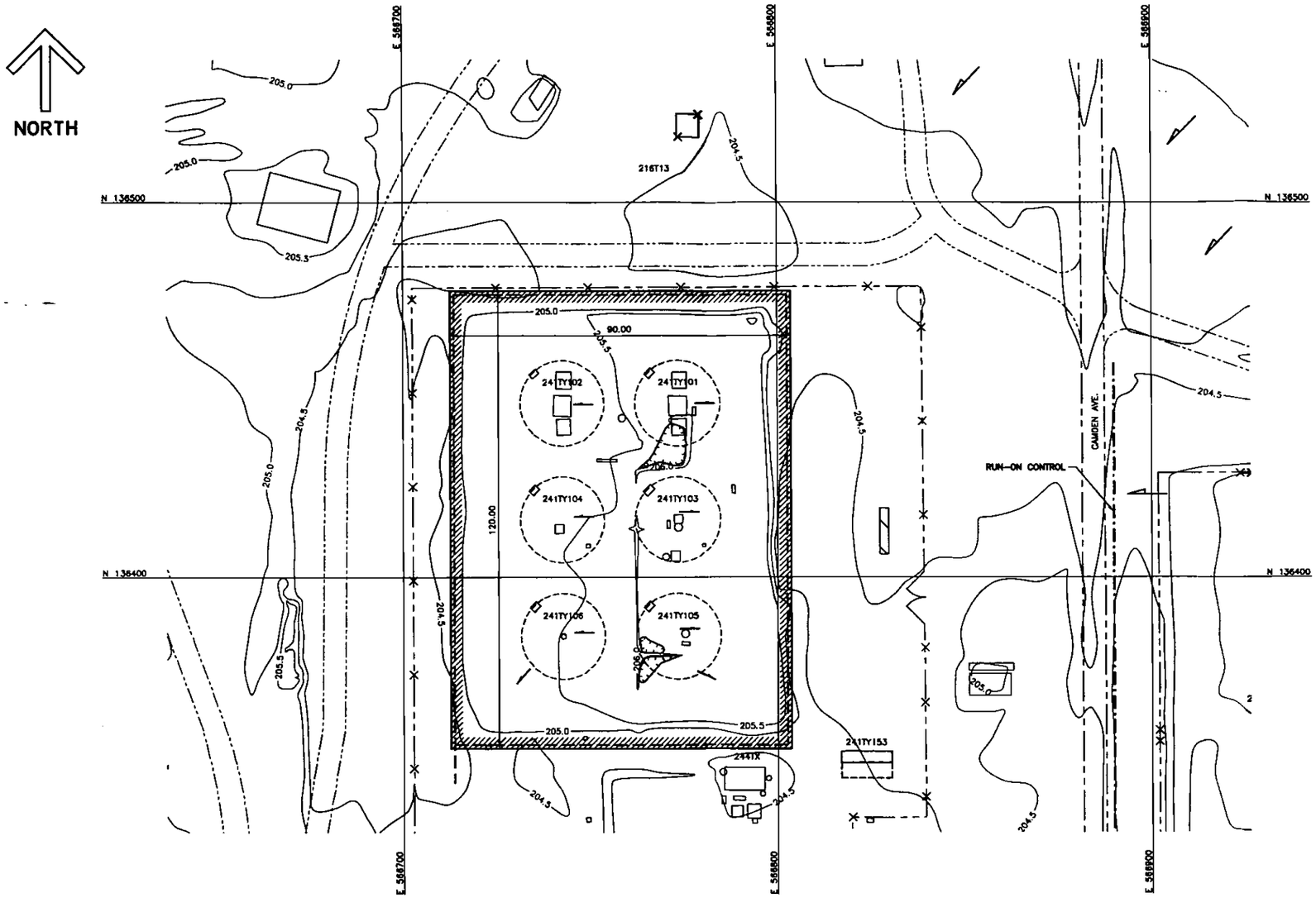
NAME	DATE
DJ WHITISH	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL SURFACE WATER CONTROL 241-TX TANK FARM

SIZE	FILE NO	AREA NO	DWG NO	REV
F	200W	0100	ES-050051-C1	1

SCALE 1:500 SHEET 15 OF



241-TY TANK FARM

LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA (A ES-050051-C1 SH 19)
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM (1 ES-050051-C1 SH 19)
- ℄ DRAINAGE DITCH (2 ES-050051-C1 SH 19)
- ℄ ASPHALT CURB (3 ES-050051-C1 SH 19)
- ℄ DRAIN TILE (4 ES-050051-C1 SH 19)
- CB CATCH BASIN AND CULVERT (5 ES-050051-C1 SH 19)
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST	REFERENCES	NEXT USED ON	

REV NO	DESCRIPTION	PREP BY DATE	CHKD BY DATE
1	ADDED GATES PER ENGR COMMENTS	PRW 9/00	

REVISIONS

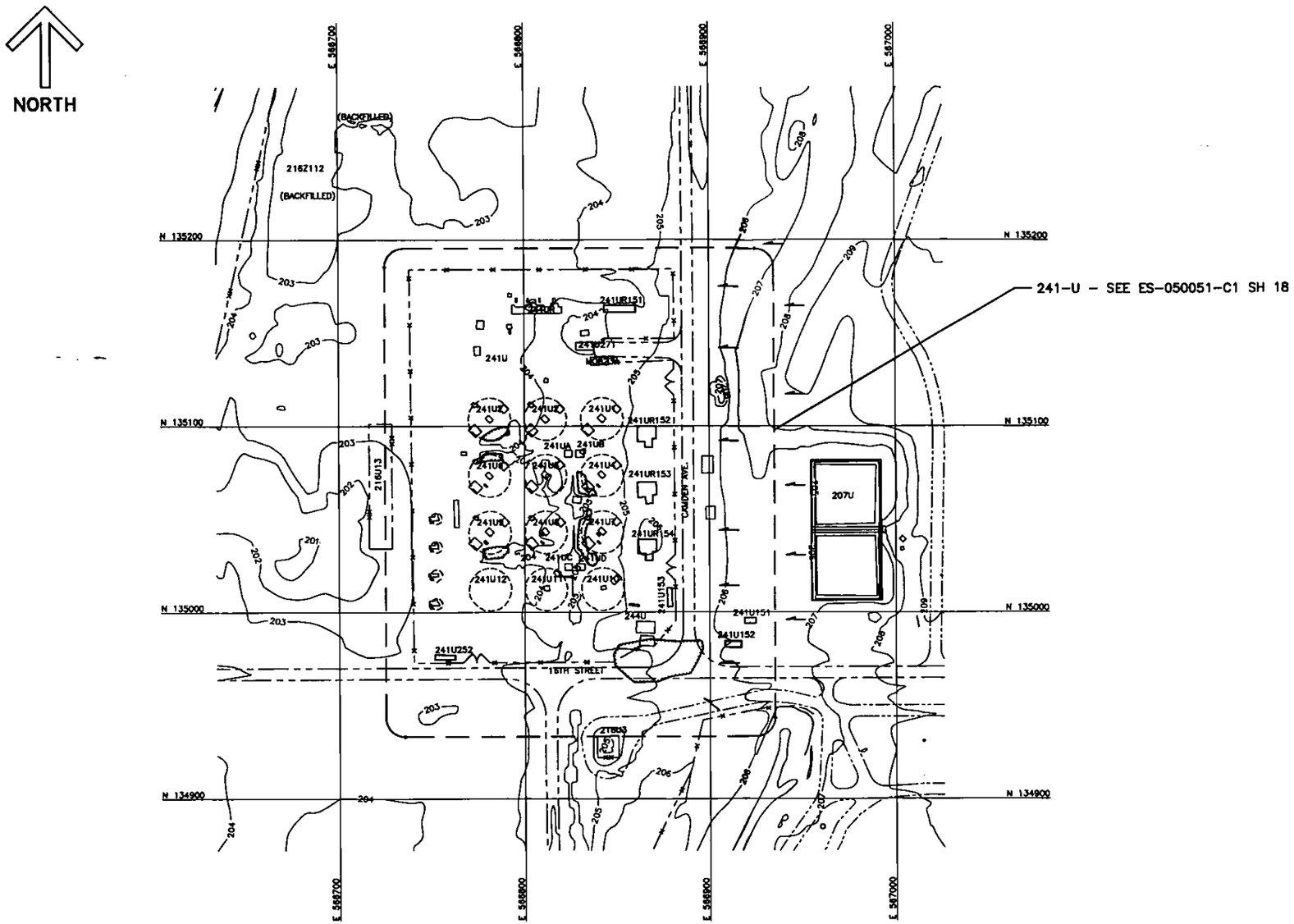
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

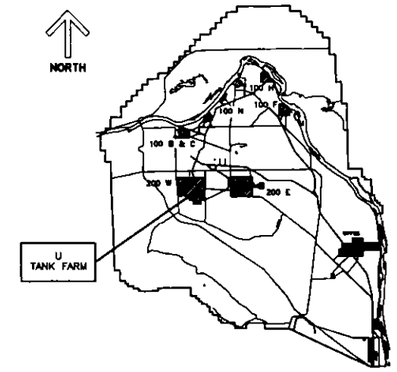
CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
241-TY TANK FARM

F | 200W | 0100 | ES-050051-C1 | 1

SCALE 1:500 | SHEET 16 OF



U TANK FARM COMPLEX



HANFORD RESERVATION

LEGEND – EXISTING:

- UNDERGROUND WASTE TANK
- 204 EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- N 130000 GRID LINE (WCS83S91 METERS)
- 291AR BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- EXISTING FENCE
- OPEN ACCESS AREA
- GATE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		NEXT USED ON	REFERENCES

REVISIONS

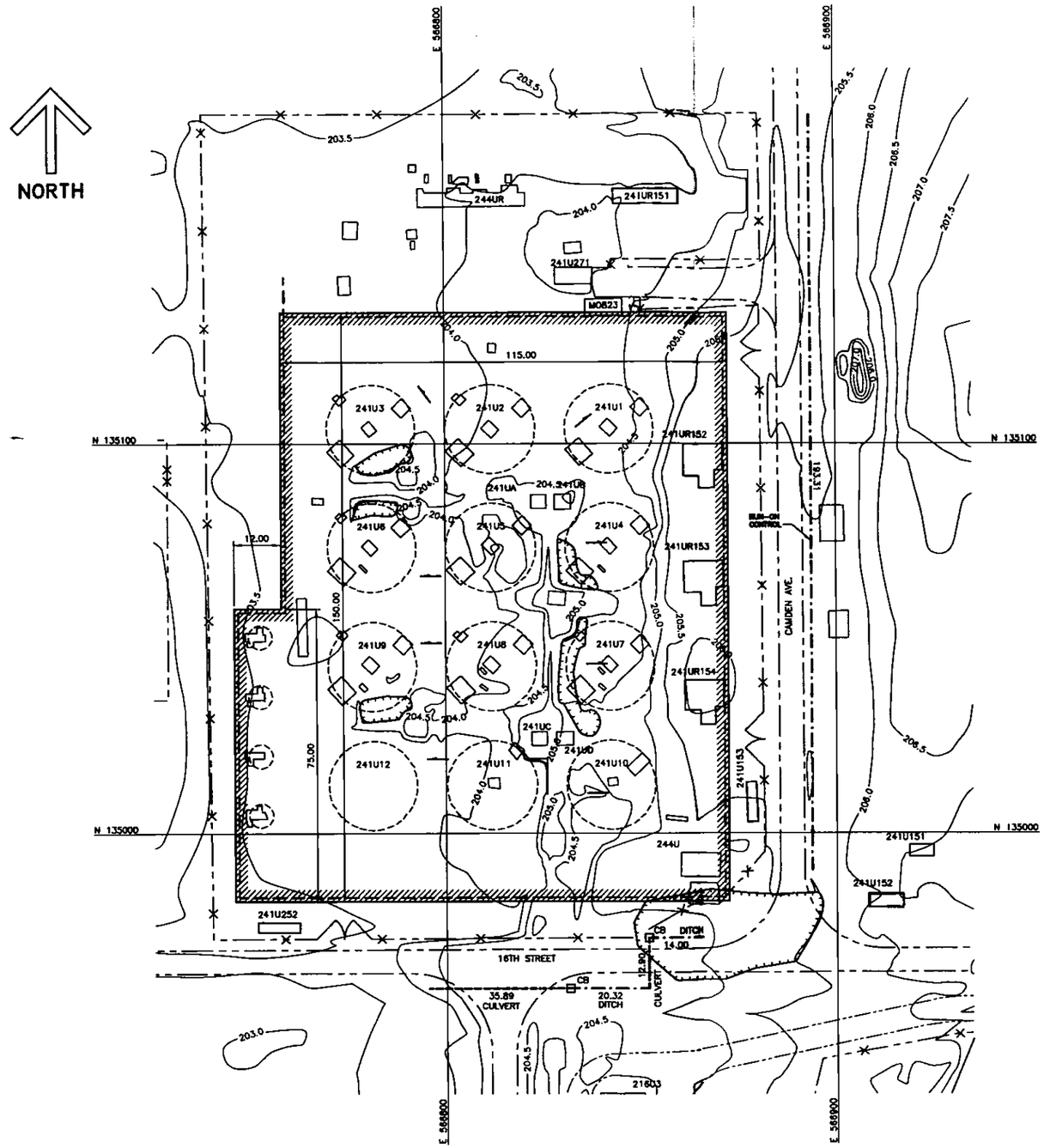
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
U FARM COMPLEX

SIZE	PLANT NO	SHEET NO	DWG NO	REV
F	200E	0100	ES-050051-C1	0

SCALE 1:1000 SHEET 17



241-U TANK FARM

LEGEND – PROPOSED:

- SURFACE WATER CONTROL AREA — A ES-050051-C1 SH 19
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- ℄ BERM — 1 ES-050051-C1 SH 19
- ℄ DRAINAGE DITCH — 2 ES-050051-C1 SH 19
- ℄ ASPHALT CURB — 3 ES-050051-C1 SH 19
- ℄ DRAIN TILE — 4 ES-050051-C1 SH 19
- CB — CATCH BASIN AND CULVERT — 5 ES-050051-C1 SH 19
- OPEN ACCESS AREA
- GATE
- EXISTING FENCE

DWG NO	TITLE	REF NUMBER	TITLE
DRAWING TRACEABILITY LIST		NEXT USED ON	REFERENCES

REV	DESCRIPTION	REVISIONS
1	ADDED GATES PER ENGR COMMENTS	FPRW 8/00

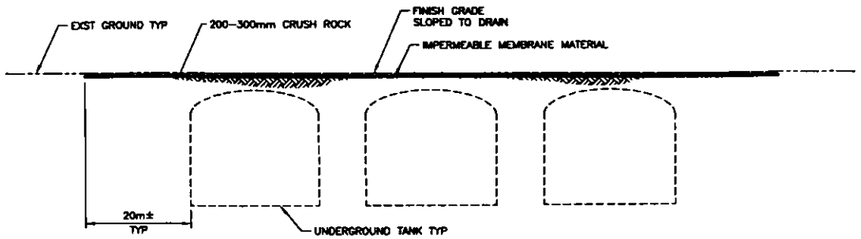
NAME: DJ WHITISH

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL SURFACE WATER CONTROL 241-U TANK FARM

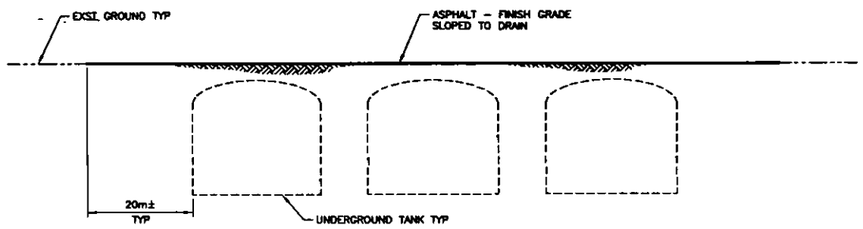
SIZE	BLDG NO	PROJ NO	DWG NO	REV
F	200W	0100	ES-050051-C1	1

SCALE 1:500 SHEET 18



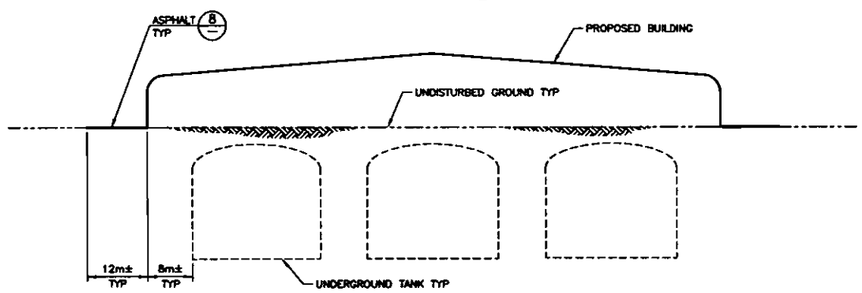
PROPOSED LINER

SEE DETAIL 6



PROPOSED ASPHALT PAVING

SEE DETAIL 7

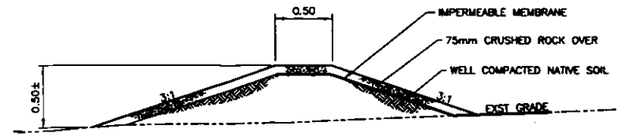


PROPOSED BUILDING

A SURFACE WATER CONTROL - SECTION

ES-050051-C1 SH 2, SH 3, SH 5, SH 6, SH 7, SH 9, SH 11, SH 12, SH 14, SH 15, SH 16, SH 18

SCALE: NONE

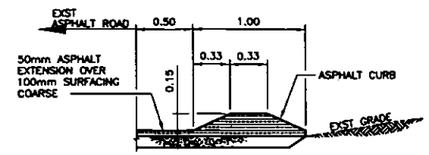


1 BERM

ES-050051-C1 SH 2, SH 5, SH 6, SH 9, SH 11, SH 12, SH 14 — NO SCALE

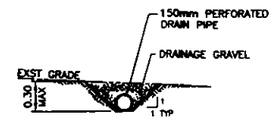
2 DRAINAGE DITCH

ES-050051-C1 SH 5, SH 16, SH 18 — NO SCALE



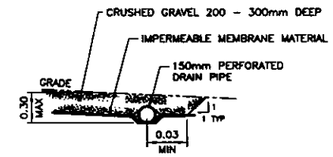
3 ASPHALT CURB

ES-050051-C1 SH 3, SH 15 — NO SCALE



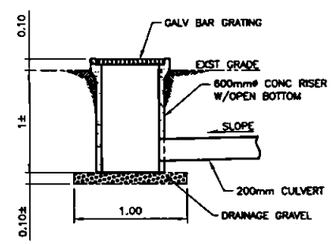
4 DRAIN TILE

ES-050051-C1 SH 1, SH 3, SH 5, SH 6, SH 7, SH 9, SH 11, SH 12, SH 14, SH 15, SH 16, SH 18 — NO SCALE



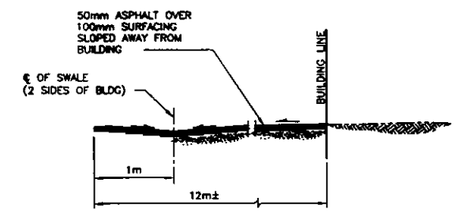
4A LINER/DRAIN TILE

ES-050051-C1 SH 1, SH 3, SH 5, SH 6, SH 7, SH 9, SH 11, SH 12, SH 14, SH 15, SH 16, SH 18 — NO SCALE



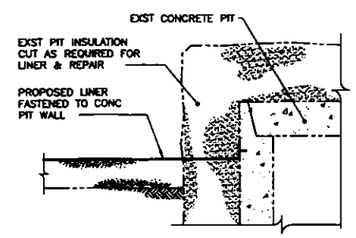
5 CATCH BASIN

ES-050051-C1 SH 5, SH 18 — NO SCALE



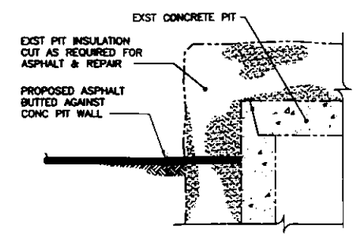
8 ASPHALT AROUND BUILDING

NO SCALE



6 LINER AT PIT

NO SCALE



7 ASPHALT AT PIT

NO SCALE

DWG NO	TITLE
DRAWING TRACEABILITY LIST	

REF NUMBER	TITLE
REFERENCES	
NEXT USED ON	

REVISIONS

NAME

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

CIVIL/ENVIRONMENTAL SURFACE WATER CONTROL DRAINAGE DETAILS

F | 200E | 0100 | ES-050051-C1

SCALE SHOWN | SHEET 19 OF