



Department of Energy

Richland Field Office

P.O. Box 550

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0022312

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JUN 3 0 1992

92-WOB-242

Mr. David B. Jansen, P. E.
Hanford Project Manager
State of Washington
Department of Ecology
Post Office Box 47600
Olympia, Washington 98504-7600

Dear Mr. Jansen:

THIRTY PERCENT DESIGN REPORT FOR THE 200 AREA TREATED EFFLUENT DISPOSAL FACILITY COLLECTION SYSTEM (PROJECT W-049H)

This letter transmits the Thirty Percent Design Report for the 200 Area Treated Effluent Disposal Facility Collection System (Project W-049H). This report is submitted to the State of Washington Department of Ecology (Ecology) to complete a compliance milestone in the Project W-049H design-construction schedule.

Project W-049H is a collection, transfer, and disposal facility, which will be located in the 200 Area on the Hanford Site. The facility will collect, transfer, and dispose of 19 effluent streams from 13 different facilities located in the 200 West and 200 East Areas.

In February 1992, the U.S. Department of Energy, Richland Field Office (RL) submitted a design-construction schedule to comply with Milestone M-17-08A of the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) and a corresponding milestone in Table 2 of Ecology Consent Order DE 91NM-177. The design-construction schedule identified dates for submittal of Thirty Percent Design Reports of the collection and disposal systems for Project W-049H. Submittal of the Thirty Percent Design Report completes the June 1992 milestone contained in the design-construction schedule for Project W-049H.

Comments on the Thirty Percent Design Report are requested by July 31, 1992, so that project delays may be avoided.



Mr. D. B. Jansen
92-WOB-242

-2-

JUN 30 1992

Should you have any questions, please contact Mr. L. S. Mamiya at
(509) 376-1471.

Sincerely,



Steven H. Wisness
Hanford Project Manager

WMD:LSM

Enclosure

cc w/encl:

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R. Stanley, Ecology
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LETTER REPORT

**200 AREA TREATED EFFLUENT DISPOSAL FACILITY
COLLECTION SYSTEM - 30% DESIGN REPORT**

PROJECT W-049H

INTRODUCTION

The U.S. Department of Energy, Richland Field Office (RL) is in the process of obtaining Washington Administrative Code (WAC), WAC 173-216 wastewater discharge permits for liquid effluents on the Hanford site. Pursuant to a schedule developed by the State of Washington Department of Ecology, the U.S. Environmental Protection Agency, Region X, and the RL agreed to submit a 30% design report in support of WAC 173-216 permitting activities for the 200 Area Treated Effluent Disposal Facility (TEDF), project W-049H.

A portion of the Hanford Site is divided into the 200-West and 200-East Areas which are separated by approximately 5 mi. Project W-049H will provide a system to safely collect, convey, and discharge liquid effluent streams for various process facilities in the 200-West and 200-East areas. (See Appendix A.)

This letter report is a 30% design report and provides an overview of the 200 Area TEDF Collection system. The overview provides the following: pipeline routings, proposed equipment, and proposed instrumentation. This letter report represents the direction of definitive design.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The collection system will utilize a combination of gravity flow and pressurized lines to collect and convey the effluent. During definitive design, the pipe routing, location of pump stations, and number of pump stations could vary from those outlined in this report as more information becomes available. As the best available technology (BAT) is developed for each generator facility, the location of tie-ins to project W-049H could vary considerably.

The change in location of tie-ins could impact pipe routing. Pipe routing may need to be altered as soil characterization along the pipe route and at the pump station sites is completed. The original plans were to use the berm of project W-105, "Liquid Effluent Retention Facility," (LERF). To avoid construction complications with project W-105 and C-018H water lines, the W-049H water line may need to be relocated. Rerouting of the pipes along the edge of Canton Avenue south of project W-105 may be considered.

Line sizes are based on stream flow information shown in Appendix A. There will be two pump stations in the collection system to lift effluent to points that will allow gravity flow to the rest of the system. The effluent streams from the 200-West and 200-East Areas will be collected and routed via polyvinyl chloride (PVC) pipe to the east perimeter of the 200-East Area where the collection system will tie into the disposal system. Effluent stream flow routings are shown on sketches ES-W049H-M605 and ES-W049H-M610. (All sketches are in Appendix C.)

Local control units (LCUs) will be provided to monitor field instruments and to monitor and control pump stations. The LCUs will be located at each generator facility and collection system pump station. The LCUs will be provided with environmentally controlled enclosures.

Power supply details for the electrical loads at the pump stations are shown on sketch ES-W049H-N615.

Standard communication and signal protocols will be used for all equipment, and a communication protocol compatible with the 242-A Evaporator and PUREX Plant Condensate Treatment Facility (project C-018H) instrumentation and control systems will be incorporated.

APPROACH/EVALUATION

200-WEST AREA COLLECTION SYSTEM PIPING

The 200-West Area collection system will consist of a combination of gravity flow and pressurized lines. (See sketch ES-W049H-M605.) A 110,000-gal collection sump (pump station No. 1), located east of the Plutonium Finishing Plant (PFP) near Camden Avenue, will be provided for collection of the 200-West Area effluent. Pump station No. 1 will be a 30-ft diameter by 25-ft deep concrete caisson. The transfer rate of pump station No. 1 is uncertain at the time of this report and will be determined during definitive design. A 20- by 20-ft insulated preengineered metal building will be provided over the caisson to enclose electrical equipment, pumps, LCUs, and other necessary equipment.

Pump station No. 1 will provide approximately 2 hours of retention capacity for the combined maximum flows from 222-S, PFP, U-Plant, T-Plant, and 284-W Power Plant. The combined flow from these facilities is approximately 883 gal/min. (See Stream Flows, Appendix A.) The 200-West Area pump station location would permit gravity flow from 284-W Power Plant (sketch ES-W049H-M606, line A), U-Plant and PFP (sketch ES-W049H-M607, lines D and C, respectively). The effluent generated by the 221-T Plant (sketch ES-W049H-M606, line A) and the 222-S Building (sketch ES-W049H-M608, line E) will transfer via a pressurized system supplied by another project. Pumps will be provided to transfer the collected effluent to a disposal system in the 200-East Area. Manholes will be provided where two collection lines join and at points in the gravity line where a change in direction is required. (See sketch ES-W049H-M605.)

200-EAST AREA COLLECTION SYSTEM PIPING

The 200-East Area collection system will consist of a combination of gravity flow and pressurized lines. (See sketch ES-W049H-M610.) The 200-East Area gravity transfer/collection piping will be routed through the center portion of the 200-East Area to a point southwest of the LERF. (See sketch ES-W049H-M610.) This routing will permit gravity flow to the tie-in with the disposal facility as well as from the Plutonium Uranium Extraction Facility (PUREX) chemical sewer. (See sketch ES-W049H-M610, line I.) The

B-Plant chemical sewer effluent will require a pressurized system to route the effluent to the 200-East Area collection piping. (See sketch ES-W049H-M610, line H.) Pump station No. 2 will be provided for the B-Plant chemical sewer effluent. Existing B-Plant pumps at 221-BF and 216-B-64 pump pit will be used for the B-Plant steam condensate and the B-Plant process condensate streams, respectively. (See sketch ES-W049H-M610, line J.) A capped connection to the 200-East DLF Project W-503 future laundry facility (see sketch ES-W049H-M610, line K) and a manhole for the future Hanford Waste Vitrification Plant (HWVP) will be provided (see sketch ES-W049H-M610). An inspection and clean-out port will be provided for the PUREX effluent stream. (See sketches ES-W049H-M605 and ES-W049H-M610, line I.) Manholes will be provided at all tie-in points with the transfer line and at points in the line where a change in direction occurs. (See sketch ES-W049H-M605.)

200-WEST TO 200-EAST AREA TRANSFER COLLECTION SYSTEM PIPING

The transfer piping from the 200-West Area to the 200-East Area will consist of a pressurized and gravity flow pipeline. (See sketches ES-W049H-M609, ES-W049H-M610, and ES-W049H-M611.) Pump station No. 1 will pump effluent to a high point between the 200-East and 200-West Areas. From this high point, the effluent stream will gravity flow to the tie-in point with the disposal facility system. (See profile on sketch ES-W049H-M608.)

INSTRUMENTATION AND CONTROLS

The instrumentation and control system will provide local and remote monitoring of the 200 Area TEDF collection system. The capability to monitor the generating facilities and to monitor and control pump station sites will be provided under project W-049H at the project C-018H control room. Monitoring and control capability will be provided at all LCUs. The proposed instrumentation and control system will provide the following:

- Three new operator control stations in the project C-018H control room.
- Local control units capable of stand-alone operation at the remote generators and pump stations.

- Local operator interfaces (LOIs) at all LCUs.

The three operator control stations located in the project C-018H control room will be programmed to provide supervisory control, alarm management graphics, engineering overview capabilities, engineering detailed analysis displays, and data for trending and reporting purposes. Each station will consist of multicolor cathode ray tubes, interface keyboards, and a 40-key, touch-screen annunciator display.

The existing project C-018H engineering operator control station will be able to configure the control algorithms, build process graphics, fill predefined control displays, configure interlocks, incorporate control strategies, and determine operating sequences for the added equipment.

The LCUs located at the pump stations will contain the necessary input/output (I/O) signal processing, safety interlocks, pump sequencing, linearizing algorithms, and controllers to locally control and monitor the pump stations. The LCUs will provide the ability to monitor and control the pump stations from the LCU location and the C-018H control room.

Local control units at the 200-West and 200-East Area generators will contain the necessary equipment to monitor the BAT signals from the generators. Local operator interfaces will be provided with LCUs used to monitor BAT signals. Local control units will be sized for a minimum of 32 alarm signals as either inputs and/or outputs.

Local access to signals will be via LOI with touch screen electroluminescent flat panel displays. Local control units and LOIs will be mounted in National Electrical Manufacturers Association (NEMA) Type 4 enclosures equipped with closed system air conditioning. The LCU configuration will be accomplished with the engineering workstation provided by project C-018H. An uninterruptible power supply (UPS) will be provided for each LCU. Each UPS standby power system will be sized to allow a safe shutdown of its LCU and prevent hazardous shutdown conditions.

The I/O is categorized as analog inputs, analog outputs, digital inputs, or digital outputs. A minimum of 30% spare capacity for each I/O type will be provided at each generator and pump station site. The I/O summary listing is an approximation. (See Appendix B.) An accurate assessment will be possible after evaluation of the individual generator's use of BAT to maintain effluent, chemical, and radiological characteristics within project W-049H target levels.

Normal and UPS standby power systems will be designed to meet the requirements of the National Electrical Code and National Electrical Safety Code.

Power for the electrical loads at the pump stations will be supplied by the sources indicated on sketch ES-W049H-N615.

The 85-hp turbine pump motors for pump station No. 1 will be controlled by variable frequency drives. These drives will allow pump speed control or torque control of either motor locally, or from a remote control room. Pump speed or torque control will be via a 4 to 20-mA analog dc signal provided by the project monitor and control station.

The grounding system design will comply with the requirements of the National Electrical Code, National Electrical Safety Code, and IEEE 142.

Lighting system designs will meet the requirements of the Illuminating Engineering Society lighting handbook, "Application Volume."

Building interiors will be provided with industrial grade, energy-efficient fluorescent fixtures. All exterior lighting will be provided by photocell-controlled, low-pressure, sodium-vapor fixtures.

Outdoor receptacles will be ground fault circuit-interrupting receptacles.

Underground conduits will be PVC-coated rigid steel or concrete-encased, Schedule 80, PVC conduit.

Data from the 200-West Area and 200-East Area generator and pump station sites will be transmitted over telephone lines to a project C-018H control room. Transmissions will be via wire modem from each generator and pump station site.

REFERENCES

1. United States Department of Energy, Richland Field Office, Plan and Schedule, "Plan and Schedule to Discontinue Disposal of Contaminated Liquids into the Soil Column at the Hanford Site," 1987.
2. Tri-Party Agreement, "Hanford Federal Facility Agreement and Consent Order," May 1989.
3. Functional Design Criteria, "200 Area Treated Effluent Disposal Facility," Project W-049H, prepared by Westinghouse Hanford Company, Document No. WHC-SD-W049-FDC-001, Rev. 0, April 1990.
4. Conceptual Design Report, "200 Area Treated Effluent Disposal Facility," Project W-049H, prepared by Kaiser Engineers Hanford Company, Document No. WHC-SD-W049-CDR-002, Rev. 0, June 1990.
5. Letter Report, "200-West Area Effluent Collection System," Project W-049H, prepared by Kaiser Engineers Hanford Company, Document No. W049HLR, Rev. 0, September 1990.
6. Quarterly Survey, "Quarterly Environmental Radiological Survey Summary, 100, 200, 300, and 600 Areas," prepared by Westinghouse Hanford Company, Document No. WHC-SP-0665-1, Second Quarter 1991.
7. Letter Report, "200 Area Treated Effluent Disposal Facility Phase II Advanced Conceptual Design Optimization of Pipeline Routing," prepared by Kaiser Engineers Hanford Company, Document No. W049HLR4, Rev. 1, January 1992.

8. Design Construction Specification, "242-A Evaporator/PUREX Plant Process Condensate Treatment Facility," Project C-018H, prepared by Westinghouse Hanford Company, Document No. V-C018HC1-001 Rev. OD, April 1992.
9. Letter Report, "Instrument and Control/Electrical" prepared by Kaiser Engineers Hanford Company, Document No. W049HLR5, Rev. 0, March 1992.
10. Engineering Report, "200 Area Treated Effluent Disposal Facility (Project W-049H) Wastewater Engineering Report", Project W049H, prepared by Westinghouse Hanford Company, Document No. WHC-SD-W049H-ER-003, Rev. 0.

APPENDICES

Appendix A. Stream Flows

Appendix B. Input/Output Summary

Appendix C. Sketches

APPENDIX A

Stream Flows

200 AREA TREATED EFFLUENT DISPOSAL FACILITY — STREAM FLOWS		
Stream	Max gal/min	Avg ¹ gal/min
East Area		
Plutonium-Uranium Extraction Chemical Sewer	600	250
Hanford Waste Vitrification Program ²	23	17
B-Plant Chemical Sewer	200	130
B-Plant Process Condensate	35	2.3
B-Plant Steam Condensate	45	.89
200-East Area Laundry ²	105	40
242-A Water Services Building	170	1.4
Total Flow	1178	
Design Flow	1178	
West Area		
Plutonium Finishing Plant waste water	150	43
T Plant waste water	73	0.56
T Plant Laboratory waste water	40	.08
UO ₃ Plant Process Condensate	30	0.5
222-S Laboratory waste water	50	4.7
UO ₃ /U Plant waste water	200	68
284-W Power Plant	340	77
Total Flow	883	
Design Flow	883	

Combined total flow = 2,061 gal/min

¹ Annualized Average Flowrate

² Future flows

APPENDIX B

Input/Output Summary

INPUT/OUT SUMMARY
MOTOR CONTROL STATION

The input/output (I/O) count for project W-049H is listed by I/O type. The I/O types were limited to four (see legend below). The I/O types will be expanded during definitive design. Listed below is a legend for those types of I/O referenced and a summary I/O list containing system total I/O and total I/O termination boards required per local control unit (LCU). Different I/O termination board prices were assumed equal for the purposes of this report. Local control units and local operator interfaces (LOI) are required at the following locations.

200-East Area (6)		200-West Area (6)	
LCU/LOI 10	- Pump station No. 2	LCU/LOI 20	- Pump station No. 1
LCU 11	- B-Plant (BPS & BCS) generator tie-in	LCU 21	- T-Plant generator tie-in
LCU 12	- PUREX generator tie-in No. 1	LCU 22	- 222-S generator tie-in
LCU 13	- PUREX generator tie-in No. 2	LCU 23	- PFP generator tie-in
LCU 14	- PUREX generator tie-in No. 3	LCU 24	- U ³ - plant generator tie-in
LCU 15	- 200-East Area Laundry	LCU 25	- 284-W generator tie-in
INPUT/OUTPUT TYPE LEGEND			
AI1:	4-20 mA smart transmitter analog input (24 Vdc transmitter loop power by LCU)		
AO1:	4-20 mA analog output		
DI1:	Discrete contact input (120 Vac external power by others)		
DO1:	Discrete contact output (120 Vac contact voltage by buyer)		

INPUT/OUT SUMMARY
MOTOR CONTROL STATION

MOTOR CONTROL STATION INPUT/OUTPUT SUMMARY TOTALS MINIMUM 30% CONTINGENCY PER INPUT/OUTPUT TYPE INCLUDED					
	AI1	AO1	DI1	DO1	NO. BOARDS
200-East Area					
LCU 10:	9	2	12	5	2
LCU 11:	9	NA	24	NA	1
LCU 12:	9	NA	24	NA	1
LCU 13:	9	NA	24	NA	1
LCU 14:	9	NA	24	NA	1
LCU 15:	9	NA	24	NA	1
200-West Area					
LCU 20:	13	3	8	5	2
LCU 21:	9	NA	24	NA	1
LCU 22:	9	NA	24	NA	1
LCU 23:	9	NA	24	NA	1
LCU 24:	9	NA	24	NA	1
LCU 25:	9	NA	24	NA	1

APPENDIX C

Sketches

ES-W049H-M600	Drawing List, Area Map
ES-W049H-M601	Legend Piping and Instrumentation
ES-W049H-M602	EFD 200W Liquid Effluent Stream
ES-W049H-M603	EFD 200E Liquid Effluent Stream
ES-W049H-M604	P&ID Pump Stations
ES-W049H-M605	Civil, Waste Disposal Sewer, 200 W Area Plan
ES-W049H-M606	Civil, Waste Disposal Sewer, Plan & Profile
ES-W049H-M607	Civil, Waste Disposal Sewer, Plan & Profile
ES-W049H-M608	Civil, Waste Disposal Sewer, Plan & Profile
ES-W049H-M609	Civil, Waste Disposal Sewer, Plan & Profile
ES-W049H-M610	Civil, Waste Disposal Sewer, 200 E Area
ES-W049H-M611	Civil, Waste Disposal Sewer, Profiles
ES-W049H-N615	Electrical One Lines

PROJECT TITLE:

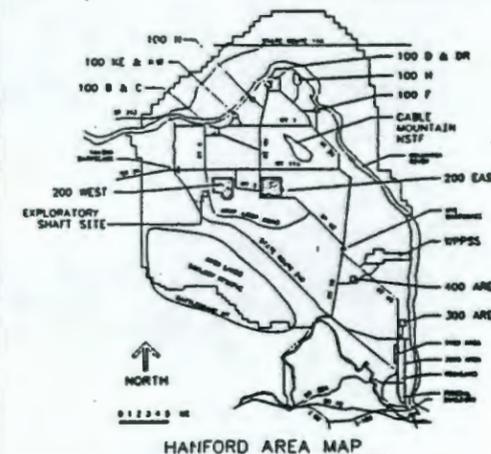
WO49H 200A TREATED EFFLUENT DISPOSAL FACILITY LETTER REPORT SIX

FOR:

WESTINGHOUSE HANFORD CO

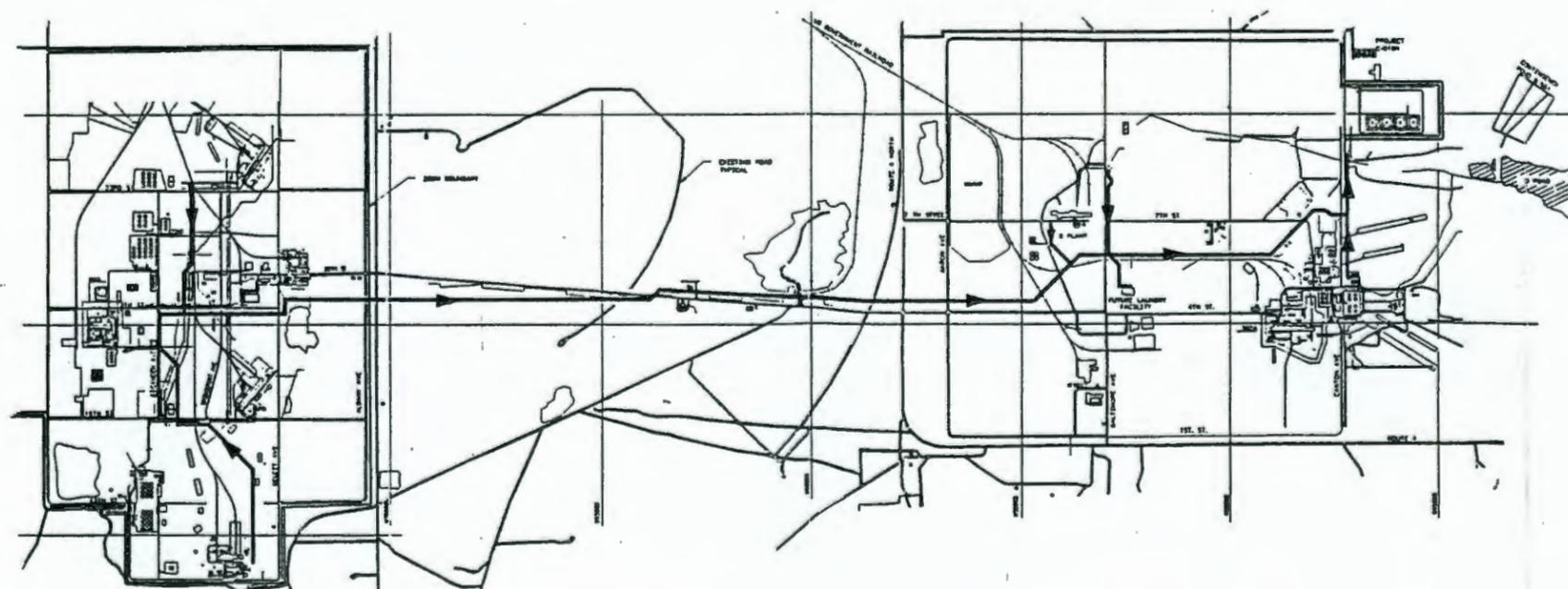
BY:

KAISER ENGINEERS HANFORD CO



D R A W I N G L I S T

DRAWING NO	BLDG NO	INDEX NO	TITLE
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ES-WO49H-M601	200A	7004	LEGEND PIPING AND INSTRUMENTATION
ES-WO49H-M602	200W	7001	EFD 200W LIQUID EFFLUENT STREAM
ES-WO49H-M603	200E	7001	EFD 200E LIQUID EFFLUENT STREAM
ES-WO49H-M604	200G	7004	P & ID PUMP STATIONS
ES-WO49H-M605	200W	0105	CIVIL WASTE DISPOSAL SEWER, 200W AREA PLAN
ES-WO49H-M606	200W	0105	CIVIL WASTE DISPOSAL SEWER, PLAN & PROFILE
ES-WO49H-M607	200W	0105	CIVIL WASTE DISPOSAL SEWER, PLAN & PROFILE
ES-WO49H-M608	200W	0105	CIVIL WASTE DISPOSAL SEWER, PLAN & PROFILE
ES-WO49H-M609	200E	0105	CIVIL WASTE DISPOSAL SEWER, PLAN & PROFILE
ES-WO49H-M610	200E	0105	CIVIL WASTE DISPOSAL SEWER, 200 E AREA
ES-WO49H-M611	200E	0105	CIVIL WASTE DISPOSAL SEWER, PROFILES
ES-WO49H-M612	200E	7201	ELECTRICAL ONE LINES



200 WEST AREA

600 AREA

200 EAST AREA

CONCEPTUAL

DESIGNED BY AR TREADWELL	CHECKED BY []	DATE []	SCALE []
U.S. DEPARTMENT OF ENERGY RICHLAND FIELD OFFICE KAISER ENGINEERS HANFORD COMPANY			
DRAWING LIST AREA MAP			
PROJECT NO. WO49H 200A TRTD EFFLUENT DSPL FACIL	DATE F 200G 8/88	DRAWING NO. ES-WO49H-M600	SHEET NO. 0
SCALE: 1"=1500' DATE: ER2052 SHEET 1 OF 1			

NO.	DESCRIPTION	DATE	BY	CHKD BY
1	ISSUED FOR PERMITS	11/0/87	WHC	[]

SYMBOL LEGEND

LINES:

- NEW PIPING (MAIN PROCESS STREAM), INSTRUMENTATION, OR EQUIPMENT
- NEW ELECTRICAL POWER OR SIGNAL
- NEW ELECTRIC BINARY SIGNAL
- INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
- EXISTING PIPING

VALVES:

- GATE VALVE
- CHECK VALVE
- BALL VALVE
- MOTOR OPERATED BUTTERFLY VALVE
- HAND OPERATED BUTTERFLY VALVE
- NEEDLE VALVE
- SOLINOID OPERATED VALVE
- SURGE ANTICIPATOR VALVE (SAV) (ELECTRONIC)

MISCELLANEOUS

- MOTOR
- REDUCER
- MAGNETIC FLOWMETER
- VARIABLE FREQUENCY DRIVE
- FLEX CONNECTION
- PLUG, EXISTING
- PLUG, NEW
- WELDED PIPE CAP

INSTRUMENTATION SYMBOLS:

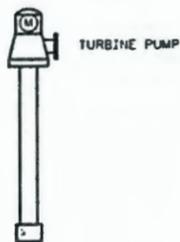
- LCU-X SHARED DISPLAY AND/OR CONTROL (ACCESSIBLE TO OPERATOR). SHARED BY MCS AND LCU-X
- INTERLOCK LOGIC IMPLEMENTED BY THE LCU (ACCESSIBLE TO OPERATOR)
- LOCAL MOUNTED INSTRUMENT
- INTERLOCK LOGIC
- MOTOR CONTROL CENTER

INSTRUMENT ABBREVIATIONS

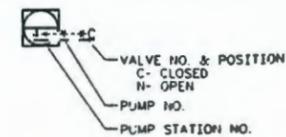
LCU LOCAL CONTROL UNIT

INSTRUMENTATION IDENTIFICATION LETTERS				
FIRST LETTER	SUCCEEDING LETTERS			
	MEASURED OR INITIATING FUNCTION	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION
A			ALARM	
C			CONTROL	
D		DETECTION		
E			SENSOR (PRIMARY ELEMENT)	
F	FLOW RATE			
H	HAND			HIGH
I	CURRENT (ELECTRICAL)		INDICATE	
L	LEVEL-LEAK			LOW
P	PRESSURE			
Q		INTEGRATE, TOTALIZE		
R	RADIATION		RECORD	
S	SPEED, FREQUENCY	SAFETY		SWITCH
T	TEMPERATURE			TRANSMIT
V				VALVE, DAMPER
Y	EVENT, STATE OR PRESENCE			RELAY, COMPUTE CONVERT
Z	POSITION			

PUMPS



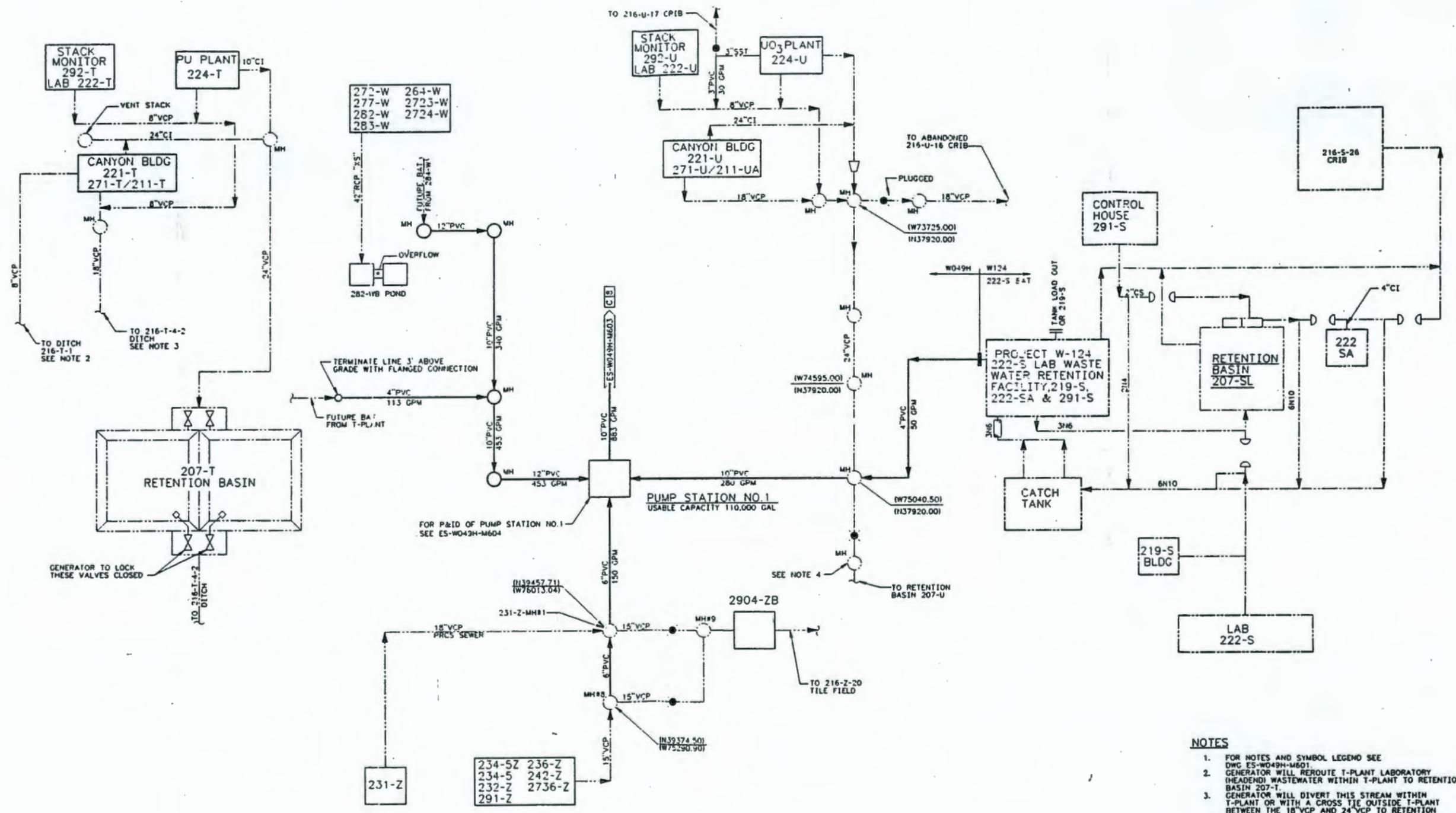
VALVE POSITION LEGEND



CONCEPTUAL

DESIGNED BY LEPPERLY	CHECKED BY	PROJECT NO. W049H-200A TRTD EFFLUENT DSPL FACIL	U.S. DEPARTMENT OF ENERGY RESEARCH FIELD OFFICE KAISER ENGINEERS MANFORD COMPANY LEGEND PIPING & INSTRUMENTATION
DATE 200A	DATE 7004	DATE ES-W049H-M601	DATE 0
SCALE NONE		SHEET NO. ER2052	

NO.	DESCRIPTION	DATE	BY	APPROVED



- NOTES**
- FOR NOTES AND SYMBOL LEGEND SEE DWG ES-W049H-M601
 - GENERATOR WILL REROUTE T-PLANT LABORATORY (HEADEND) WASTEWATER WITHIN T-PLANT TO RETENTION BASIN 207-T.
 - GENERATOR WILL DIVERT THIS STREAM WITHIN T-PLANT OR WITH A CROSS TIE OUTSIDE T-PLANT BETWEEN THE 18" VCP AND 24" VCP TO RETENTION BASIN 207-T.
 - GENERATOR TO RELOCATE FLOW MEASUREMENT AND SAMPLING FROM THIS MANHOLE TO MANHOLE LOCATED AT COORDINATES (W74595.00) (N37920.00).

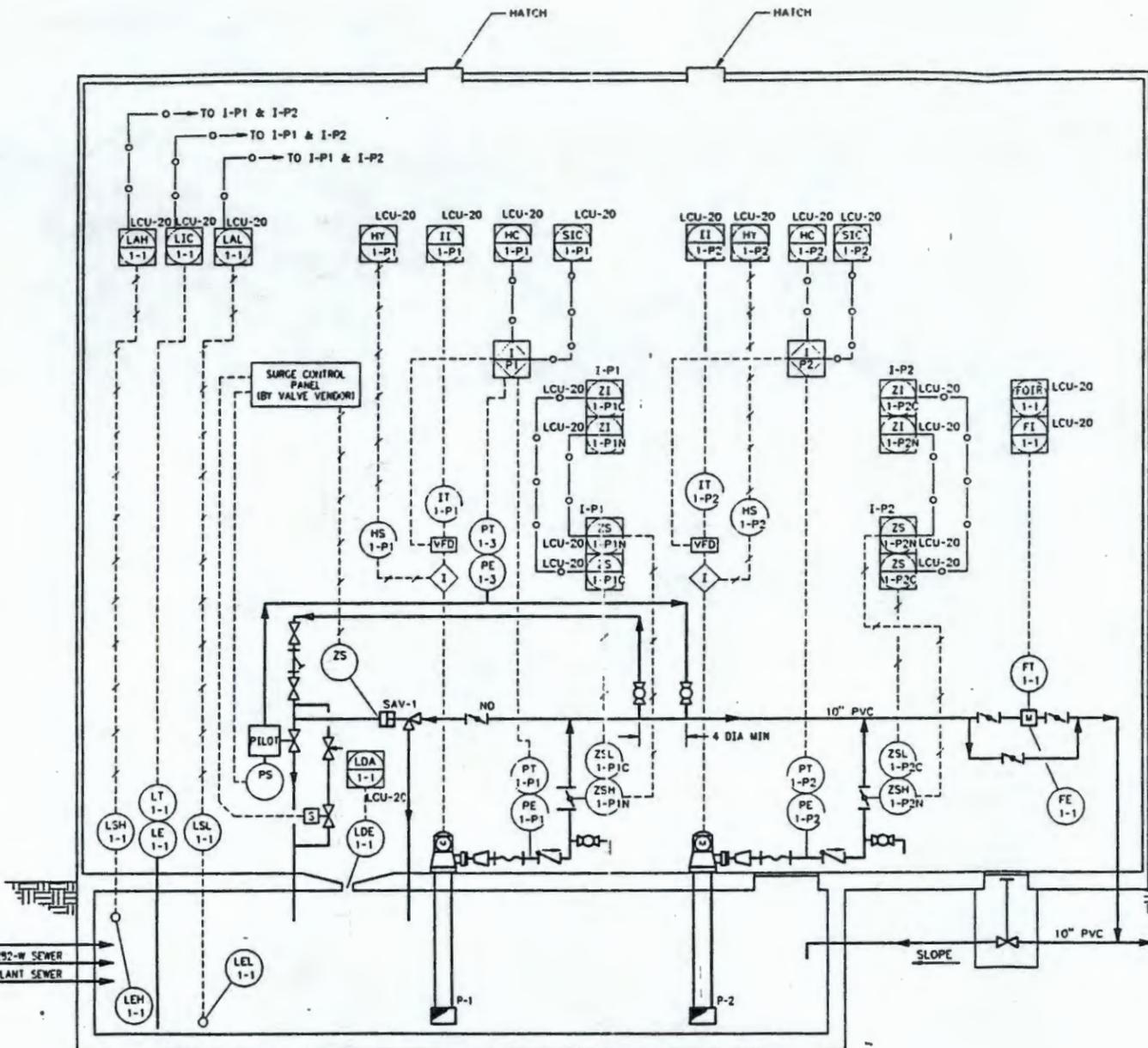
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232-Z	2736-Z
291-Z	

CONCEPTUAL

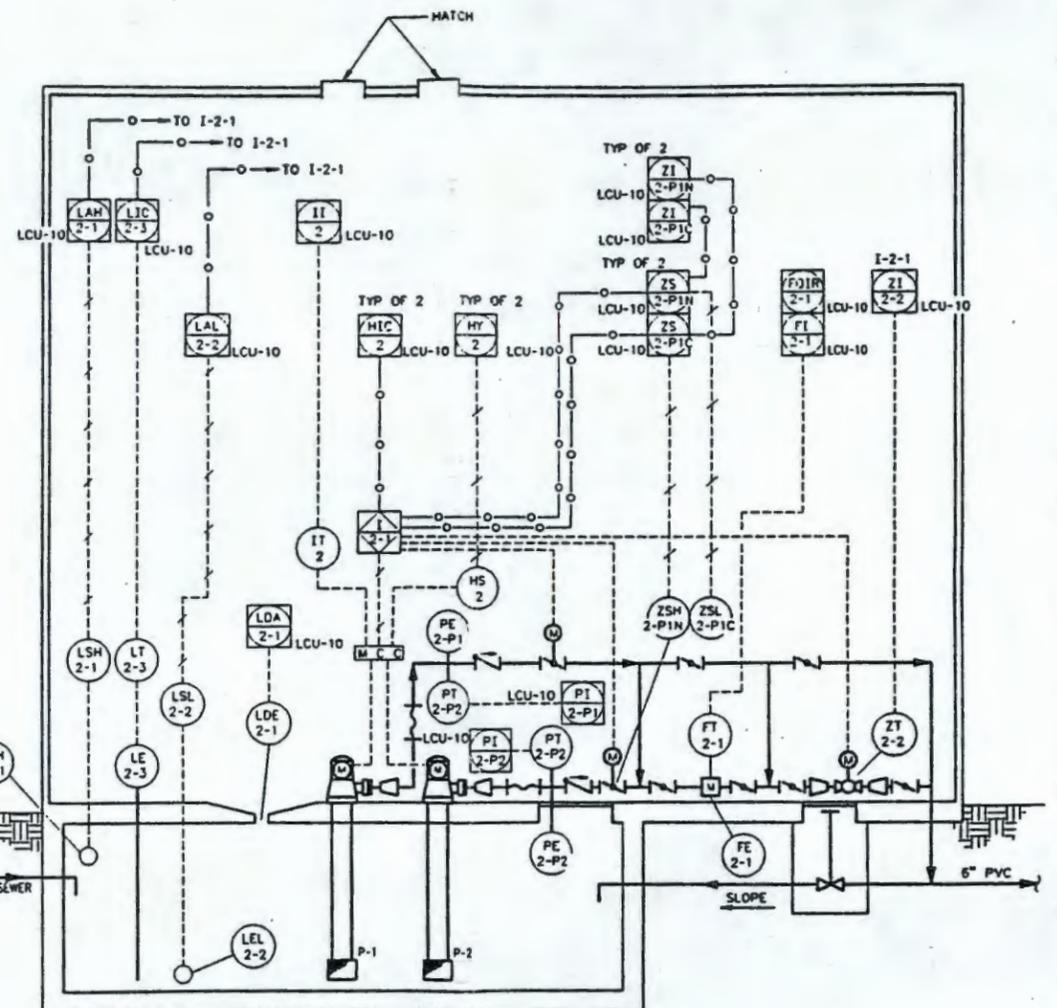
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RICHMOND FIELD OFFICE					
KATSER ENGINEERS HANFORD COMPANY					
EFD					
200W					
LIQUID EFFLUENT STREAM					
PROJECT: W049H 200A TRID EFFLUENT DSPL FACIL					
SHEET NO. 7001					
ES-W049H-M602.0					
DATE: NONE					
JOB NO. ER2052					
SHEET 1 OF 1					

DRAWING LIST

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PUMP STATION NO. 1
110,000 GALLON CAPACITY



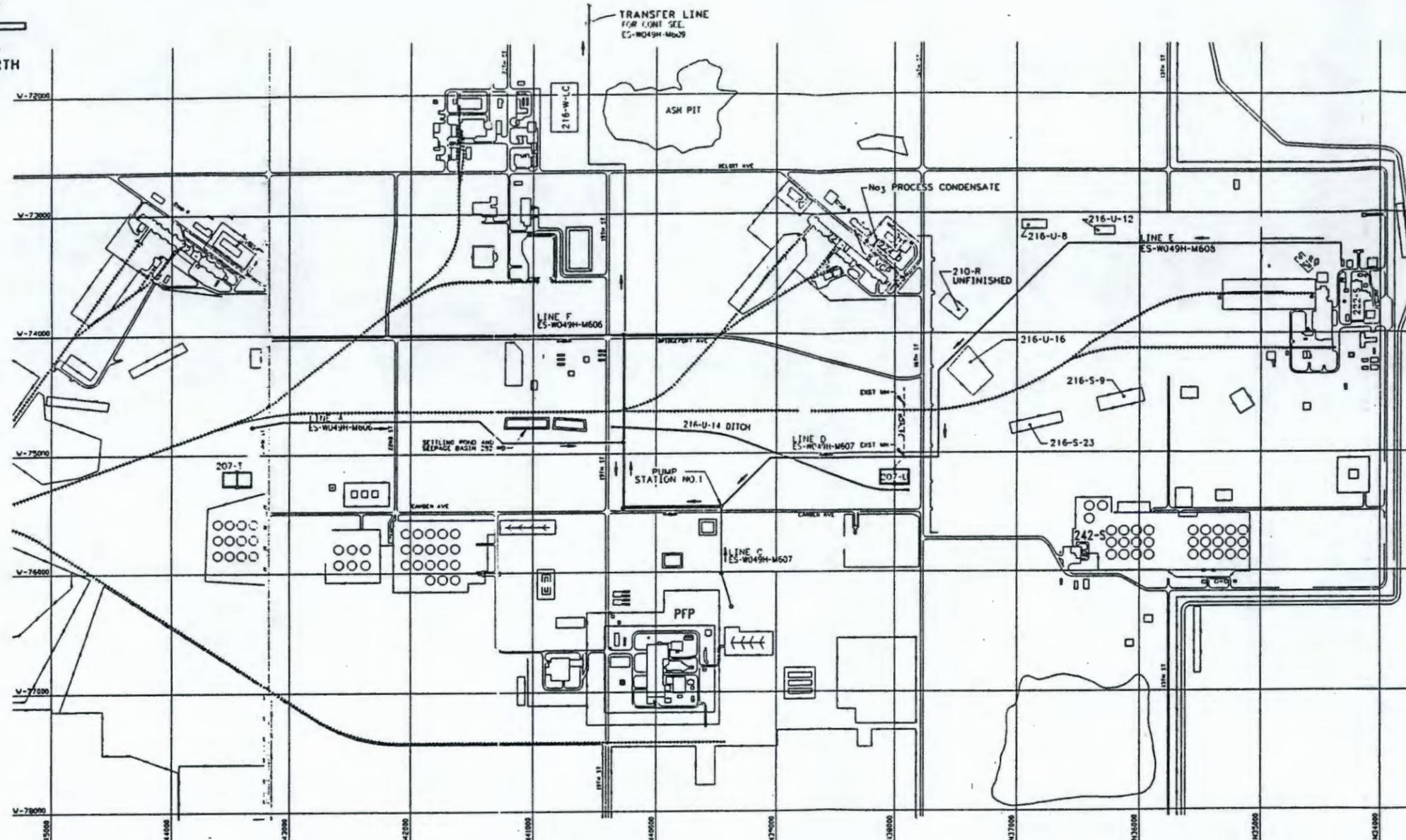
PUMP STATION NO. 2
15,000 GALLON CAPACITY

NOTES:
1. FOR NOTES AND SYMBOL LEGEND
SEE ES-W049H-M601

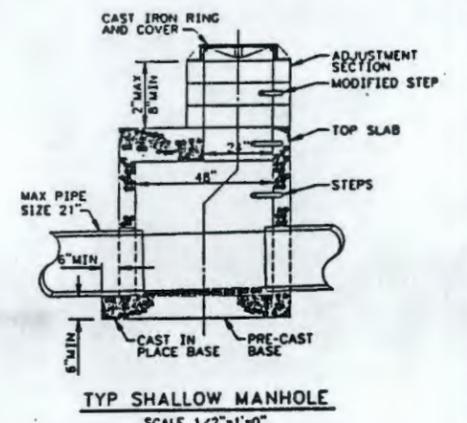
CONCEPTUAL

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CHECKED BY		DATE	
APPROVED BY		DATE	
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PROJECT: ES-W049H-200A TRTD EFFLUENT DSPL FACIL		REV. NO. 0	
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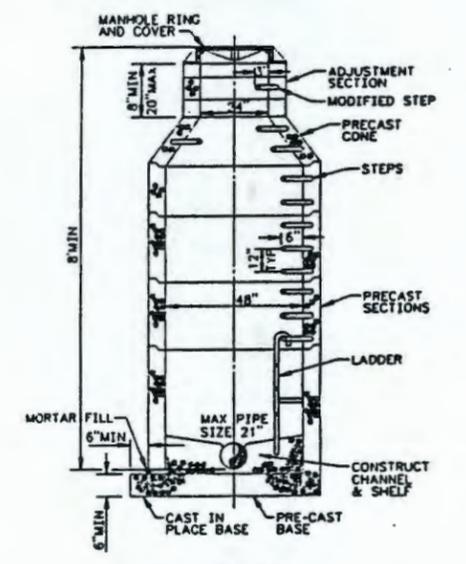
NO.	DESCRIPTION	DATE	BY	APP'D
1	ES-W049H-M601 DRAWING LIST			
2	ES-W049H-M601	10/20/00	PD ROBERTS	
3	ES-W049H-M601	10/20/00	PD ROBERTS	
4	ES-W049H-M601	10/20/00	PD ROBERTS	
5	ES-W049H-M601	10/20/00	PD ROBERTS	



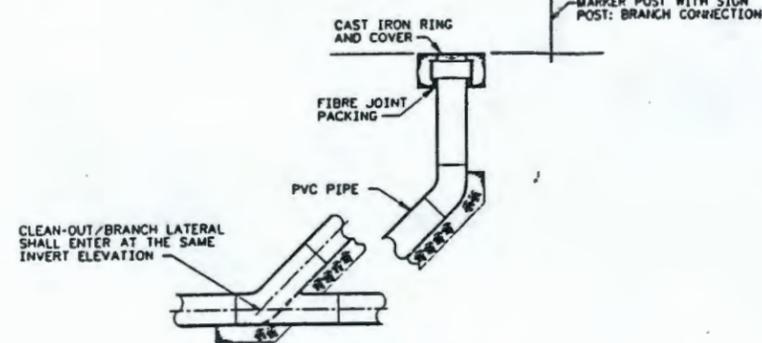
200 WEST PLAN, LINES A, C, D, E, F, & TRANSFER LINE
SCALE: 1" = 40'



TYP SHALLOW MANHOLE
SCALE 1/2"=1'-0"



TYP DEEP MANHOLE
SCALE 1/2"=1'-0"



TYP CLEAN-OUT DETAIL
SCALE 1/2"=1'-0"

DRAWING TRACABILITY LIST		DRAWING LIST		REVISIONS		REV. APPROVALS		DATE		PROJECT		SCALE		SHEET	
NUMBER	TITLE	NUMBER	TITLE	NO.	DESCRIPTION	DATE	BY	DATE	BY	NO.	DESCRIPTION	SCALE	NO.	DESCRIPTION	NO.
		ES-W049H-M600	DRAWING LIST								WO49H 200A TRTD EFFLUENT DSPL FACIL				
											F 200W 0105	ES-W049H-M605	0		
											SCALE SHOWN	ER2052	1		
											2	plot scale 1=400			

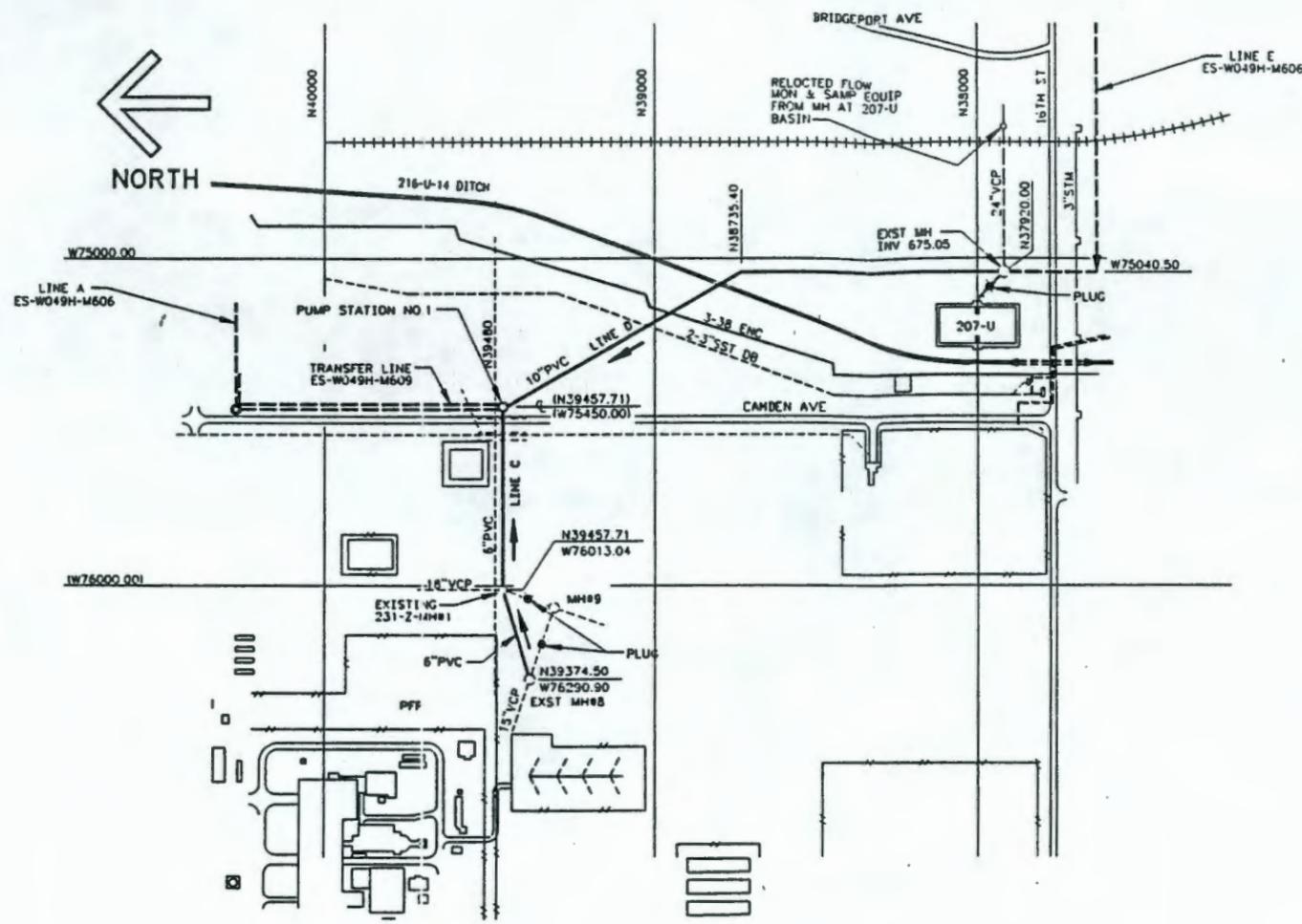
CONCEPTUAL

U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
KAISER ENGINEERS HANFORD COMPANY
PIPING
WASTE DISPOSAL SEWER
200W AREA PLAN

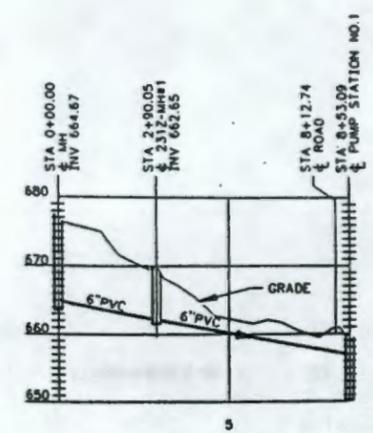
PROJECT: WO49H 200A TRTD EFFLUENT DSPL FACIL
SHEET NO: F 200W 0105
DRAWING NO: ES-W049H-M605

DATE: 01/20/82
SCALE: SHOWN
SHEET NO: 1 OF 1

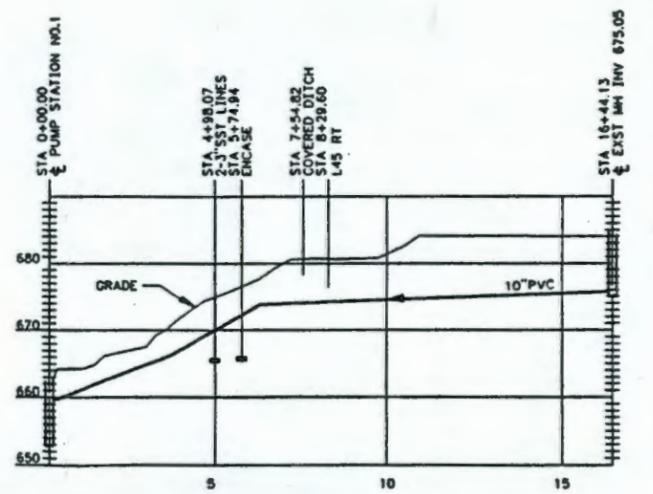
2 plot scale 1=400 KEH/CAD 1 C-6



PLAN-LINE C & D
SCALE: 1"=200'



PROFILE-LINE C
SCALE HORIZONTAL: 1"=200'
VERTICAL: 1"=10'



PROFILE-LINE D
SCALE HORIZONTAL: 1"=200'
VERTICAL: 1"=10'

NO.	DATE	DESCRIPTION	BY	CHKD
1	10/1/00	ISSUED FOR PERMITS	JW	WJ
2	10/1/00	REVISED PER COMMENTS	JW	WJ
3	10/1/00	REVISED PER COMMENTS	JW	WJ
4	10/1/00	REVISED PER COMMENTS	JW	WJ
5	10/1/00	REVISED PER COMMENTS	JW	WJ

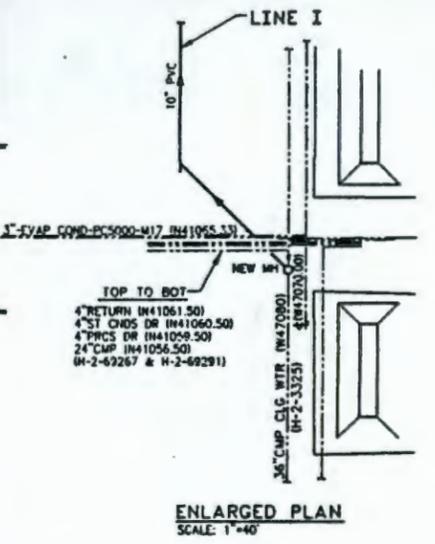
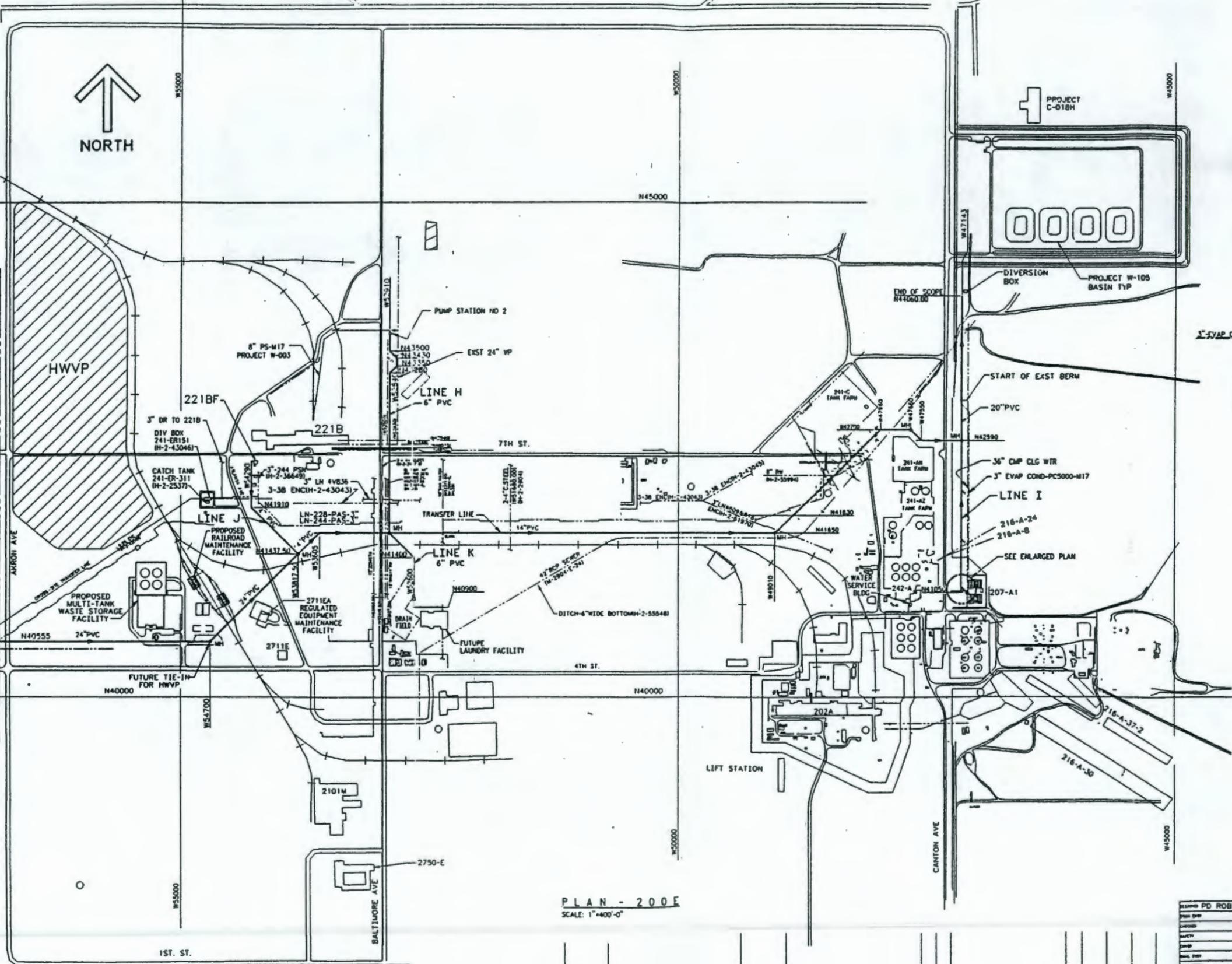
CONCEPTUAL

DESIGNED BY B SHEPPARDES	CHECKED BY WJ	DATE 10/1/00
U.S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE KATSEP ENGINEERS HAYFORD COMPANY		
PIPING WASTE DISPOSAL SEWER PLAN & PROFILE		
PROJECT NO. W049H-200A TRTD EFFLUENT DSPL FACIL	SCALE F 200'	DWG NO. ES-W049H-M607
DATE 10/1/00	BY WJ	CHKD WJ

2 PLOT SCALE: 1"=200' KENCAD 1 C-8



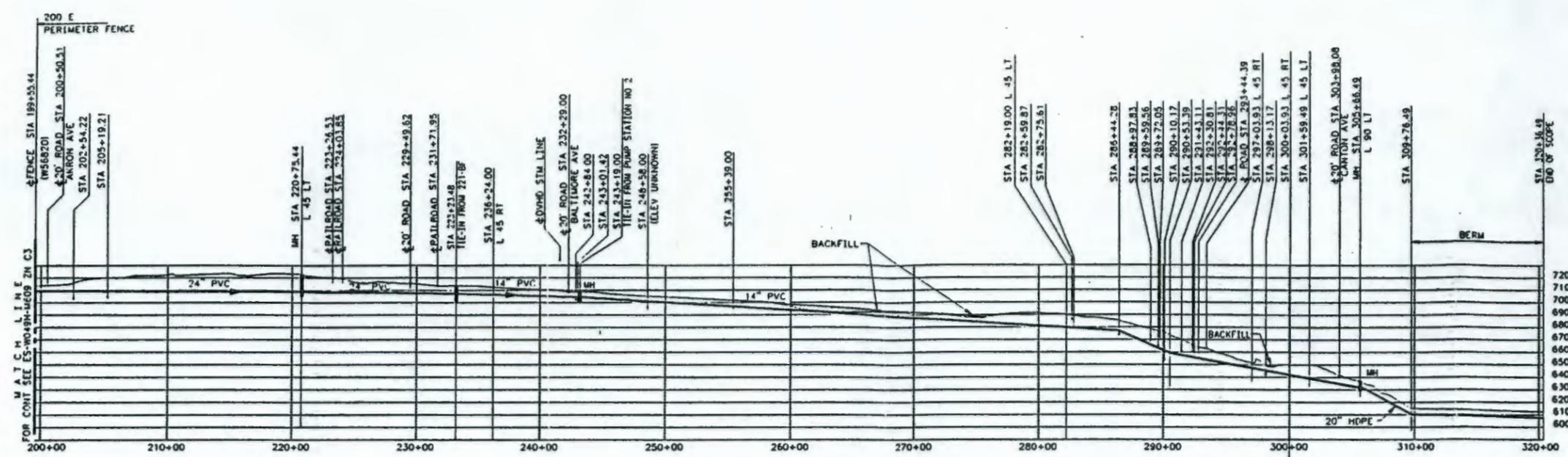
MATCH LINE FOR CONTINUATION SEE DWG ES-W049H-M609 2nd C3



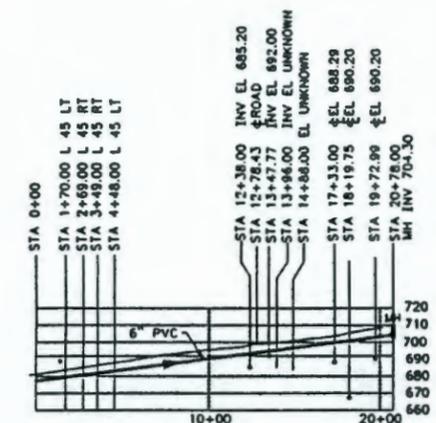
PLAN - 200E
SCALE: 1"=400'-0"

CONCEPTUAL

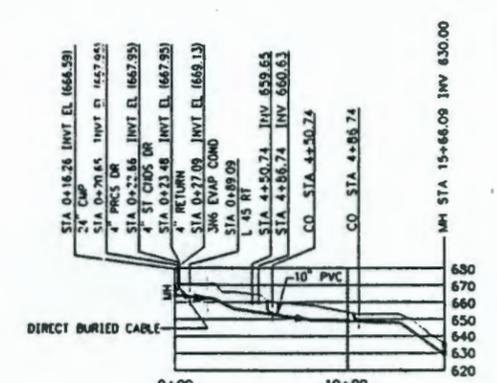
ES-W049-M600 DRAWING LIST NO. NAME 1. ES-W049-M600 CONCEPTUAL PLAN 2. ES-W049-M610 CONCEPTUAL PLAN		PROJECT NO. ES-W049H-M610 SHEET NO. 0105 DATE 200E	U.S. DEPARTMENT OF ENERGY RICHLAND FIELD OFFICE KAISER ENGINEERS HANFORD COMPANY CIVIL WASTE DISPOSAL SEWER 200E AREA PROJECT NO. W049H 200A EFFLUENT DSPSL FACIL SHEET NO. 0105 DATE 200E DRAWN BY WHC CHECKED BY ER2052 PLOT SCALE: 1"=400 KENCAD 1 C-11
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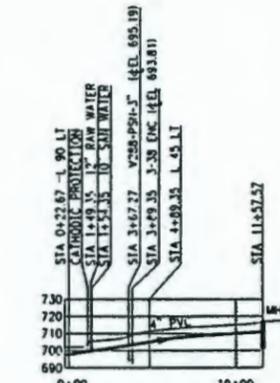
PROFILE - TRANSFER LINE
 SCALE: HORIZ 1"=400'
 VERT 1"=40'



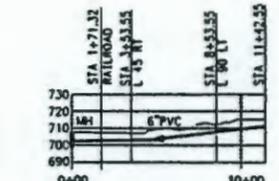
PROFILE - LINE H
 SCALE: HORIZ 1"=400'
 VERT 1"=40'



PROFILE - LINE I
 SCALE: HORIZ 1"=400'
 VERT 1"=40'



PROFILE - LINE J
 SCALE: HORIZ 1"=400'
 VERT 1"=40'



PROFILE - LINE K
 SCALE: HORIZ 1"=400'
 VERT 1"=40'

DRAWING LIST		REVISIONS		DATE	
NO.	DESCRIPTION	BY	CHKD	DATE	DATE
1	ES-W049H-M600				
2	ES-W049H-M611				

PROJECT	NO. 2000	DATE	0105	PROJECT	NO. 2000	DATE	0105
U.S. DEPARTMENT OF ENERGY RICHLAND FIELD OFFICE KATSER ENGINEERS MANFORD COMPANY				CONCEPTUAL			
WASTE DISPOSAL SEWER PROFILES				ES-W049H-M611 10			
DRAWN BY: PD ROBERTS				CHECKED BY: []			
SCALE: 1"=400'				PLOT SCALE: 1"=400'			

