



U.S. Department of Energy

Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

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056083

JAN 29 1998



Mr. Steve M. Alexander  
Perimeter Areas Section Manager  
Nuclear Waste Program  
State of Washington  
Department of Ecology  
1315 W. Fourth Avenue  
Kennewick, Washington 99336-6018

Dear Mr. Alexander:

HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (TRI-PARTY AGREEMENT)  
DISPUTE DOCUMENTATION FROM THE MEETING HELD ON FEBRUARY 2, 1998

In support of the pending informal Project Managers' dispute for Tri-Party Agreement Interim Milestone M-16-01E, the U.S. Department of Energy, Richland Operations Office (RL), is providing Mr. Phil Staats, State of Washington Department of Ecology, with the attached discussion documentation. The information provided in the documentation supports RL's informal request for the interim milestone extension to July 31, 1998. Also included in the discussion documentation is RL's response to those action items taken at the February 2, 1998, meeting, as well as additional comments received from Mr. Staats via a cc:Mail message dated February 4, 1998. Separate correspondence is being prepared to submit a revised Change Control Form for Interim Milestone M-16-01E with the new proposed completion date of July 31, 1998, and associated justification.

RL looks forward to working with Ecology staff and would like to take this opportunity to thank Ecology for continued support on this dispute and the N Reactor Deactivation Project. If you have any questions, please contact me at 376-4798.

Sincerely,

*Heather Trumble*

for Paul M. Pak, Senior Project Manager  
N Area Project

NAP:PMP

Attachment

cc w/o attach:  
L. D. Arnold, FDH  
L. E. Gadbois, EPA  
M. K. Harmon, EM-442  
T. E. Logan, BHI  
R. D. Morrison, FDH  
D. R. Sherwood, EPA  
M. A. Wilson, Ecology

cc w/attach:  
P. R. Staats, Ecology

056085

# Hanford Environmental Restoration

**DOE / Ecology TPA Discussion**

**N Area Project**

**February 2, 1998**

**Richland Operation Office  
Restoration Project**



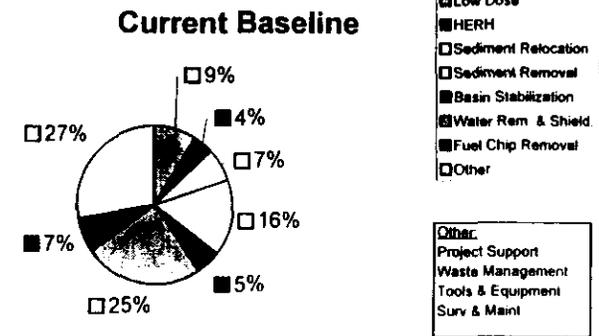
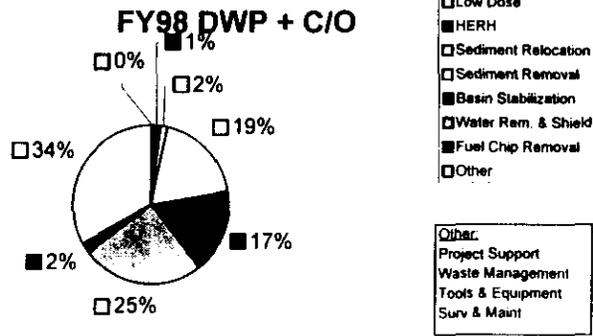
**Bechtel Hanford, Inc.**  
Environmental Restoration Contractor



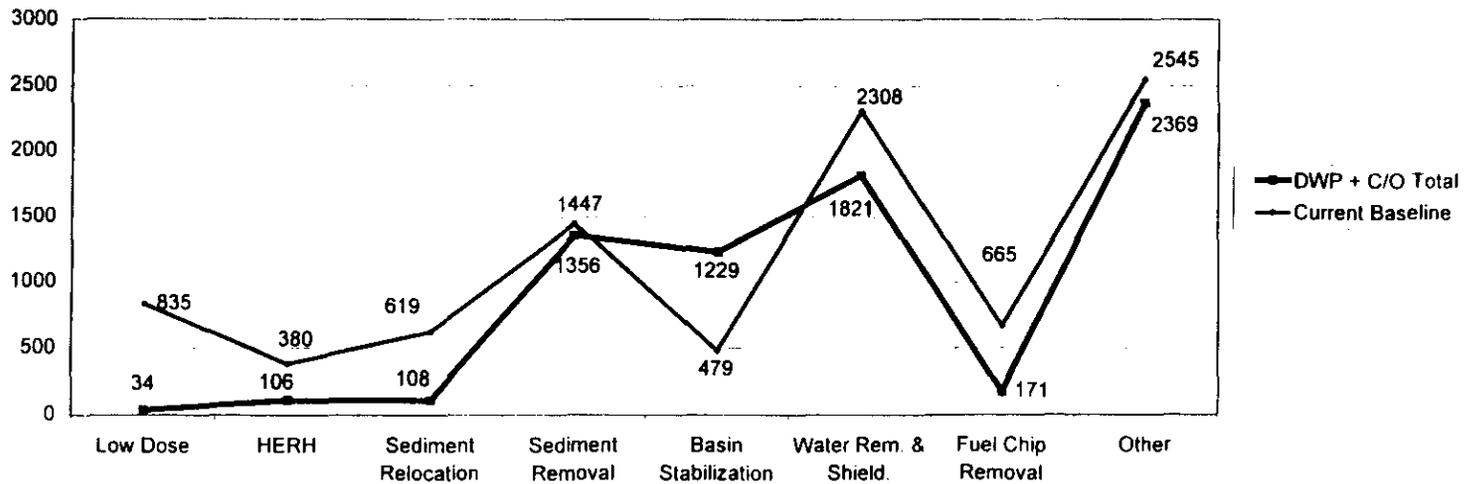
**N Area Project  
DOE/ Ecology Project Managers  
TPA Discussion  
February 2, 1998  
10:00 A.M. to 12:00 P.M.**

- |        |  |                              |
|--------|--|------------------------------|
| I.     | Overview of Project Assumption Changes             | Pak                          |
| II.    | Detailed Discussion of Changes                     |                              |
| II. A  | Waste Removal Quantity Increases                   | Trumble                      |
| II.A.1 | Sediment Relocation Equipment Inadequacy           | Duncan                       |
| II.A.2 | Cubicle Cleanup Methodology                        | Duncan                       |
| II. B  | Craft "Bumping" Impacts                            | Kisenwether                  |
| II. C  | Increased Duration in Sediment Solidification      | Duncan                       |
| II. D  | Basin Surface Stabilization (Fixative / Shielding) | Day                          |
| II. E  | Spent Nuclear Fuel                                 | Pak                          |
| II. F  | Increased Duration in Water Removal                | Kisenwether                  |
| II. G  | TPA Reconciliation                                 | Logan                        |
| II. H  | Schedule Improvement Opportunities and Risk Areas  | Logan                        |
| III.   | Conclusion - Proposed M-16-01E TPA Milestone Date  | Staats/Pak/<br>Trumble/Logan |

## Baseline Comparisons FY98 DWP + Carryover Vs. Current Baseline



**DWP+C/O vs. Current Baseline  
(\$ in Thousands)**



## II.A - Low Dose Rate and High Exposure Rate Waste Quantity Increases

Description of Cause	FY98 DWP Assumptions	Actual
<p><b>Overall increase in total Low Dose Rate Hardware</b></p> <p>Increased Quantity of Low Dose Rate Hardware discovered during sediment relocation</p> <p>Failure of sediment relocation equipment (ROSEE) generated add'l amounts of Low Dose Rate Hardware</p> <p>Increased Quantity of Low Dose Rate Hardware due to removal of shielding interferences</p> <p>The establishment of waste disposal criteria for lead allowed the disposal of contaminated lead</p> <p>Increased contamination levels on additional hardware retrieved in the sediment layer required additional decontamination and airborne protection for personnel</p> <p>FDH lay-off of Operators in January, 1998</p>	<p>128 Cu. Ft. remaining in FY98</p> <p>Attachments to the N Basin walls will be left in place</p> <p>Low Dose estimates only included fast carts and basin segregation doors</p> <p>ROSEE and Air Lift were only equipment systems planned to be utilized</p> <p>Lead was to be stored at the BHI lead storage area. Disposal of non-reusable lead was not budgeted for FY98</p> <p>Previous low dose hardware removal activities did not require personnel to be on mask.</p> <p>No allowance for impacts to project as a result of craft "bumping"</p>	<p>Revised Forecast 1,847 Cu. Ft. in FY98</p> <p>Necessary to remove attachments to the Basin walls in order to allow for installation of concrete shielding (New Scope)</p> <p>Significant quantities of Low Dose rate debris found in sediment layer (grating, cubicle covers, tritium targets, etc.)</p> <p>Sediment relocation operations extended to include sandpiping as well as additional airlifts for retrieving small debris from the cubicles. More rigorous and lengthy sediment relocation efforts increased low dose rate hardware volumes (hoses, decant filter, etc)</p> <p>The N Area Project led the efforts to establish and utilize lead disposal criteria. This allowed for co-disposal with both HERH and low dose rate waste, thereby avoided leaving legacy hazardous waste requiring surveillance and future disposal(i.e. Lead filled green fuel monitor, lead bricks, lead blankets)</p> <p>Handling of additional low dose quantities with higher contamination levels required N Basin personnel to be on mask with associated productivity loss</p> <p>Bumping of craft workers in January 1998 resulted in productivity loss</p>
<p><b>Increases in Quantity of High Exposure Rate Hardware (HERH) to be Removed</b></p> <p>Increased Quantity of HERH Discovered during sediment relocation</p> <p>Significant changes in the sediment relocation methodology involving more rigorous and extensive efforts generated add'l HERH waste volumes</p>	<p>-5 Monoliths required for FY98</p> <p>-No appreciable amounts of HERH were assumed to be in the cubicles</p> <p>-One 3M filter will be sufficient to maintain water clarity and to filter the water for draindown</p>	<p>-Current forecast is 9 Monoliths for FY98</p> <p>-Extensive amounts of HERH debris were discovered during sediment relocation activities (process tubes, buggy springs, spacers), requiring 2 added Monoliths</p> <p>-Additional Tri-Nuc and 3M filter units have been required to maintain water clarity during final sediment relocation and waste removal efforts, resulting in 2 additional Monoliths</p>

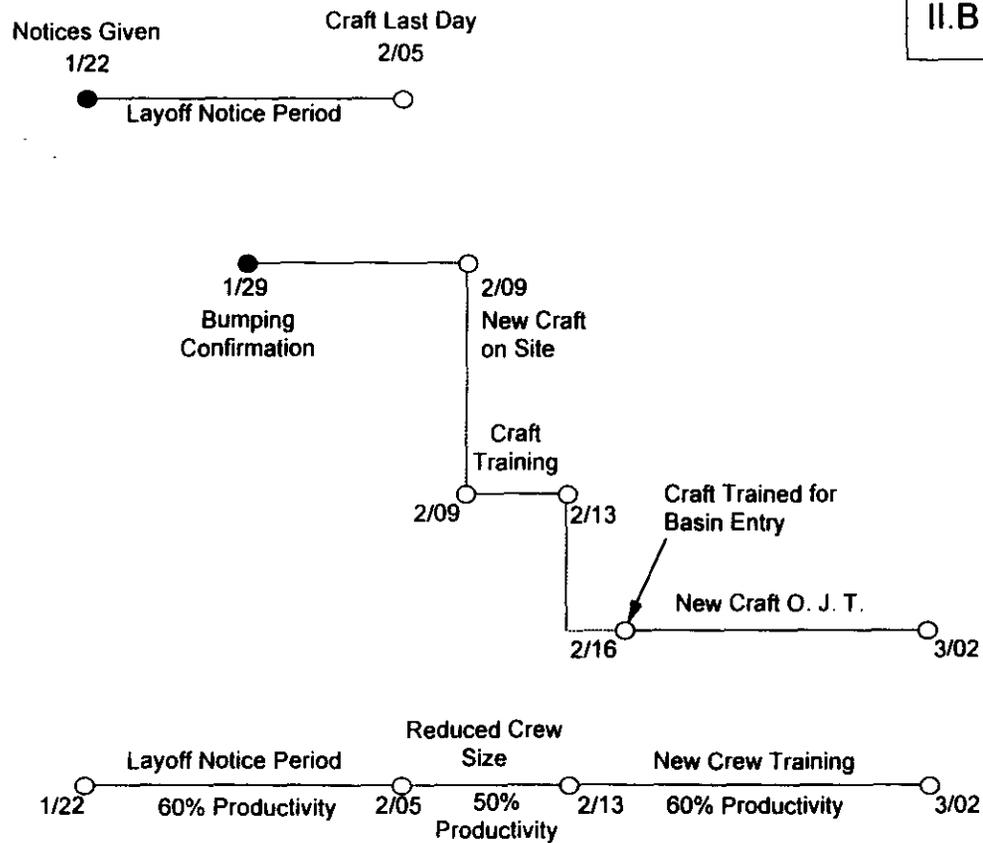
## II.A.1 - Sediment Relocation Equipment Inadequacy

Description of Cause	FY98 DWP Assumptions	Actual
<p>Sediment relocation equipment developed by previous contractor was found to be inadequate, requiring development of new equipment, modifications, and changes in operations</p>	<ul style="list-style-type: none"> <li>- The ROSEE system would be adequate to relocate sediment from the basin to the north cask pit at reasonable rates.</li>   <li>- The ROSEE system would function to minimize impacts on water clarity via the operation of the cyclone separators</li> </ul>	<ul style="list-style-type: none"> <li>-The ROSEE system did not produce adequate suction to remove all sediment from basin floor surfaces, or transport sediment to the North Cask Pit at reasonable rates.               <ul style="list-style-type: none"> <li>- The air lift device was tried as a sediment removal device (with high impact on water clarity).</li> <li>- Sandpiper pumps were eventually used to relocate sediment</li> </ul> </li>   <li>- The cyclone separators did not function well, resulting in excessive carryover of lighter sediment particles, impairing water clarity, actions taken to compensate included:               <ul style="list-style-type: none"> <li>- Increased settling time and frequently decanting the North Cask Pit to avoid carryover</li> <li>- Sandpiper operation necessitated installing staged filters to filter carryover water</li> <li>- increased filtration of basin water to maintain clarity</li> </ul> </li> </ul>

## II.A.2 - Cubicle Cleanup Methodology

Description of Cause	FY98 DWP Assumptions	Actual
<p>Cleanup, of the 1,024 N Basin cubicles, has been considerably more involved and time-consuming than anticipated.</p>	<ul style="list-style-type: none"> <li>-Cubicles contained a moderate amount of sediment easily removable by the ROSEE system.</li>   <li>- Debris in cubicles would be small and encountered only occasionally. This debris would be removed by ROSEE.</li>   <li>- No fuel pieces would be encountered.</li>   <li>- Tracking of cleanup status would be simple, with confirmation of cleanliness performed on a percentage basis</li> </ul>	<ul style="list-style-type: none"> <li>- A large number of cubicles contain appreciable amounts of sediment, some of which is crusted, requiring hydrolasing to break up prior to removal. ROSEE system design inadequate for conditions leading to development.</li>   <li>- A significant number of cubicles contained appreciable amounts of small debris (e.g., buggy springs and rubble) requiring air lifting or clamshell devices to remove. A large number of cubicles contained larger debris requiring pick and place operations to clean out.</li>   <li>- Fuel was found in a number of cubicles, requiring a careful search of all cubicles for fuel pieces</li>   <li>-An extensive cleanup management scheme has been necessary using videotaping, dose measurement and mapping, and databases; engineering review and feedback; engineering analysis to remove conservatism from acceptance criteria; and an iterative cleanup process</li>   <li>-Inspection for and removal of hazardous material</li> </ul>

## II.B - Project Impacts of Craft Bumping



### Assumptions

- Based on reduction of 12 of 34 Total Current D&D Workers
- 2.5 week schedule impact from 1/22 through 3/2

## II.C - Increased Duration in Sediment Solidification

Description of Cause	FY98 DWP Assumptions	Actual
<p>Increased time for sediment solidification will be required due to higher required packaging volumes to meet waste acceptance criteria.</p> <p>This is caused by increased radionuclide concentrations in the final sediment characterization (includes a doubling of the TRU content).</p>	<p>-No subcontractor changes will result from the final sediment characterization (Phase II sample data will be similar to Phase I sample data)</p> <p>-There will be no change in the subcontractor sediment removal duration [winning contractor's bid was 8-10 liners, filled in 3 weeks, overall bid duration was consistent with DWP assumption]</p> <p>-No allowance was made for craft "bumping"</p>	<p>- Changes will result because of higher radionuclide content:</p> <ul style="list-style-type: none"> <li>- more packaging volume (more liners) are needed to accommodate TRU content and to reduce package dose rates (see below)</li> <li>- higher contact dose rates in pumped sediment reduce productivity (20% increase in duration)</li> </ul> <p>- Up to 29 liners may be required, extending duration</p> <p>-Craft "bumping" may cause loss of trained sediment removal personnel, requiring 1 week of retraining for new personnel</p>

## II.D - Basin Surface Stabilization (Fixative / Shielding)

Description of Cause	FY98 DWP Assumptions	Actual
<p><b>Basin Shielding Required:</b></p> <ul style="list-style-type: none"> <li>-July 1997 dose rate measurements much higher than anticipated</li> <li>-Hydrolasing not cost/schedule effective in removing contamination from basin walls</li> <li>-Fixative application to basin walls becomes ALARA issue</li> <li>-Total basin shielding concept initiated to resolve dose rate, hydrolasing, and ALARA issues</li> </ul>	<ul style="list-style-type: none"> <li>-Acceptable unshielded dose rates during and after water draindown</li> <li>-Wall decontamination by hydrolasing (2,500 PSI)</li> <li>-Fixative applied to basin walls, floors and cubicles for dose reduction and airborne contamination control</li> <li>-Treatment of up to 15 hot spots (2R/hr contact), and place shielding on basin floor surfaces, exclusive of cubicles</li> <li>-Requires installation of N Basin tunnel door seal before draindown</li> <li>-Other work activities (e.g., hardware removal) conducted during draindown</li> </ul>	<p>Original plan not compatible with actual conditions</p> <ul style="list-style-type: none"> <li>-Unshielded dose rate measurements are much higher than anticipated and unacceptable</li> <li>-Tests with high pressure hydrolasing prove ineffective (~10,000 PSI)</li> <li>-Wall dose rates significantly increase personnel exposure</li> <li>-Requires removal of all basin interferences before draindown; Installation of beams and 12" thick concrete panels; Installation of steel cubicle covers for airborne contamination control</li> <li>-Tunnel door seal not required, but requires fixative applied in tunnel</li> <li>-All activities must be complete prior to shielding installation and shielding must be installed prior to initiation of draindown</li> </ul>

## II.E - Spent Nuclear Fuel

Description of Cause	FY98 DWP Assumptions	Actual
<p><b>Change in Location of Shipping Fuel</b></p> <p>In December 1997, FDH recommended to RL that the fuel fragments discovered in the N Basin be transported to the 327 Facility for interim storage until the fuel can be transported to 100-K Basins for consolidation with the balance of the Hanford Site spent nuclear fuel (SNF) inventory. Facility modifications and discovery of an Unreviewed Safety Question (USQ) prevented K Basins from receiving the N Basin SNF fragments. In January 1998 DOE accepted the recommendation and provided programmatic direction to BHI to transfer the fuel to the 327 facility.</p>	<p>-Fuel Fragments will be shipped directly to K Basins for Storage / Disposal</p>	<p>Shipment to 327 Facility rather than K Basins. 327 Facility, only viable location, required the following additional scope:</p> <ul style="list-style-type: none"> <li>-Fabricate additional transport canisters</li> <li>-Fabricate gas traps for storage at 327</li> <li>-Issue Work Order to PNNL to perform Transportation Limits Calculation for the Safety Evaluation Plan (SEP)</li> <li>-Issue Work Order to Waste management to revise SEP for packaging</li> <li>-Develop, Review, &amp; Approve Memorandum of Understanding to ship fuel to 327 Facility</li> <li>-Design, Fabricate and Install spider for shipping cask (previous spider was disposed of by K Basins)</li> <li>-Issue a Categorical Exclusion for transport by truck to 327 Facility</li> <li>-Develop and Coordinate Approval of Notice of Construction (NOC) with the Dept. of Health and EPA</li> <li>-Additional tooling required to install canister lid and sort fuel for maximum packaging efficiency</li> </ul> <p>Additional coordination activities for Design Engineering, Field Support, Radiological Control &amp; Project Controls</p>
<p><b>Change in Quantity of Fuel Located</b></p> <p>In January 1998, total fuel fragments located exceeded the assumed weight of 204 lbs. (including 3 complete inner fuel elements and 2 complete outer elements) which necessitated 2 shipments.</p>	<p>-No more than 204 lbs. of Fuel Fragments will be located</p> <p>- The volume discovered would only require 1 shipment</p>	<p>-Perform a USQD to assess the impact of finding &gt; 204 lbs.</p> <p>-Perform additional handling of fuel in the Basin (weighing, sorting packaging)</p> <p>-Two shipments now required</p>

## II.F - Increased Duration in Water Removal

Description of Cause	FY98 DWP Assumptions	Actual
Increased duration of Basin water removal due to offloading capabilities at ETF	<p>-ETF can off-load and release nine 5,000 gallon tankers per day</p> <p>-Three 5,000 gallon tankers are available at no cost , including no maintenance allowance</p>	<p>-ETF off-loading capabilities have not proven successful at achieving necessary nine tankers per day. Off-load and release reduced to four 4,500 gallon tankers per day, doubling planned duration.</p> <p>-ETF informed project that two tankers available, Walker tanker not available</p> <hr/> <p>Project Action – Continue to explore methods/processes that increase off-loading rates.</p>

## WATER TRANSFER EXPERIENCE

PROJECT	RISK LEVEL (Radiological)	RATE (Tankers)	COMMENTS
ERDF	Low	6/day	24 hour day, winter, emergency 3 tankers
		3/day	8 hour day, fall, 2 tankers
D-AREA	Low	3/day	9 hour days, winter, 2 tankers
EDB	Medium	3/day	9 hour days, summer, 2 tankers
LIFT STATION	Medium	2/day	10 hour day, summer, emergency, 2 tankers
<b>N-BASIN</b>	<b>High</b>	<b>Forecast 4/day</b>	<b>22 hour day, spring, 2 tankers</b>

- **N-Basin is based on 2 – 4500 gal. Tankers**

## Summary of Leachate Shipments

Date	Tanker Shipment	Volume	Cumulative	Comments
1/20/97	2	10,000	10,000	12 hours worked
1/21/97	2	10,000	20,000	12 hours worked
1/22/97	4	20,000	40,000	12 hours worked
1/23/97	5	25,000	65,000	12 hours worked
1/24/97	6	30,000	95,000	12 hours worked
1/25/97	6	30,000	125,000	12 hours worked
1/26/97	0	-	125,000	No shipments planned
1/27/97	0	-	125,000	ETF Loadout frozen
1/28/97	3	15,000	140,000	ETF Loadout frozen (6 hours worked)
1/29/97	4	20,000	160,000	Icy Road conditions (8 hours worked)
1/30/97	7	35,000	195,000	12 hours worked
1/31/97	6	30,000	225,000	12 hours worked
2/1/97	12	60,000	285,000	Started shipping at 7:00 am 24 hours per day.
2/2/97	17	85,000	370,000	24 hours worked
2/3/97	17	85,000	455,000	24 hours worked
2/4/97	18	90,000	545,000	24 hours worked
2/5/97	9	45,000	590,000	12 hours worked
2/6/97	9	45,000	635,000	12 hours worked
2/7/97	7	35,000	670,000	12 hours worked
2/8/97	4	20,000	690,000	6 hours worked
2/9/97	8	40,000	730,000	12 hours worked
2/10/97	8	40,000	770,000	12 hours worked
2/11/97	7	35,000	805,000	Icy Road conditions (10 hours worked)
	0	-	805,000	ETF shutdown for receipt of other waste
2/18/97	5	25,000	830,000	8 hours worked
2/19/97	5	25,000	855,000	8 hours worked
2/20/97	6	30,000	885,000	8 hours worked
2/21/97	5	25,000	910,000	8 hours worked
2/24/97	4	20,000	930,000	8 hours worked
2/25/97	6	30,000	960,000	8 hours worked
2/26/97	0	-	960,000	ETF Shutdown - Health and Safety Plan Issue
2/27/97	4	20,000	980,000	8 hours worked
2/28/97	3	15,000	995,000	5 hours worked - Monolith Training
3/3/97	6	30,000	1,025,000	8 hours worked
3/4/97	4	20,000	1,045,000	8 hours worked
3/5/97	5	25,000	1,070,000	8 hours worked
3/6/97	5	25,000	1,095,000	8 hours worked
3/7/97	0	-	1,095,000	Teamster not available
3/10/97	5	25,000	1,120,000	Teamster not available
Totals	224	1,120,000		

### Summary of Leachate Shipments

Date	Tanker Shipment	Volume	Cumulative	Comments
8/12/97	1	5,000	5,000	2 hours worked - pressure test of tanker/ETF
9/5/97	1	5,000	10,000	2 hours worked - pressure test of tanker/ETF
10/8/97	2	10,000	20,000	First shipment of Fall campaign, Hot Tanks Delay
10/10/97	2	10,000	30,000	RSR from ETF to ERDF cause delay,ETF PUMPS
10/14/97	4	20,000	50,000	
10/15/97	3	15,000	65,000	
10/16/97	4	20,000	85,000	
10/17/97	3	15,000	100,000	
10/20/97	3	15,000	115,000	1 hour delay due to lack of RCT coverage
10/21/97	5	25,000	140,000	
10/22/97	5	25,000	165,000	
10/23/97	4	20,000	185,000	
10/24/97	3	15,000	200,000	
10/27/97	4	20,000	220,000	
10/28/97	3	15,000	235,000	ETF Slow
10/29/97	2	10,000	245,000	ETF Slow
10/30/97	1	5,000	250,000	Closed down due to high winds
<b>Totals</b>	<b>50</b>	<b>250,000</b>		

47 50

N Area Project  
TPA Date Reconciliation

Current TPA Date 4/1/98

Scope Changes:                      Duration Change

–     Shielding                      1.5 Weeks

–     Waste Volumes                5 weeks

- HERH
- Low Dose
- Sediment Relocation

–     Craft Bumping                2.5 Weeks

–     Sediment Removal            7 Weeks

Total Change                      16 Weeks

Proposed TPA Date 7/31/98

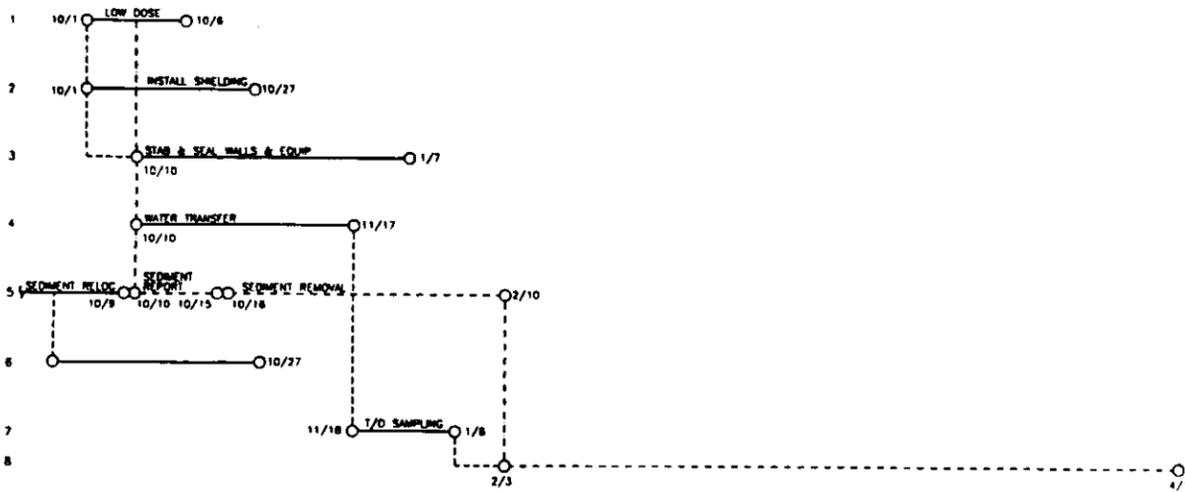
## II.H – Improvement Opportunities to Support 7/17/98 Target

Activity	Assumed Impact to Current Schedule	Actions to Minimize Impact
Craft Bumping	2.5 Weeks	<ul style="list-style-type: none"> <li>- Streamline new craft training</li> <li>- Team experienced craft with new craft</li> </ul>
Basin Water Removal	5 Weeks	<ul style="list-style-type: none"> <li>-Work with ETF               <ul style="list-style-type: none"> <li>-System Modifications</li> <li>-Process Modifications</li> </ul> </li> <li>-Strive for original duration of 33 days (added training, etc.)</li> </ul>
Sediment Removal	10 Weeks	<ul style="list-style-type: none"> <li>-Finalize sediment to grout ratio</li> <li>-Work with Chem Nuc. to minimize schedule               <ul style="list-style-type: none"> <li>-More containers equals less dose</li> <li>-Change grouting methodology</li> </ul> </li> </ul>

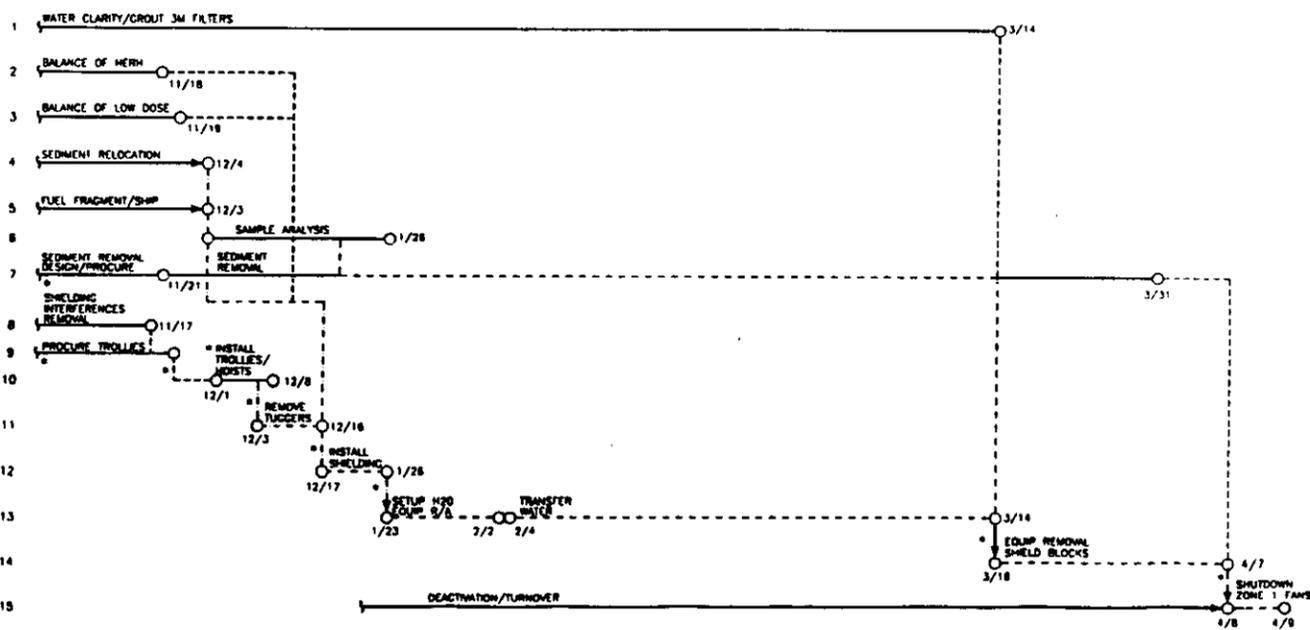
# SCHEDULE COMPARISONS

(AS OF 2/2/98)

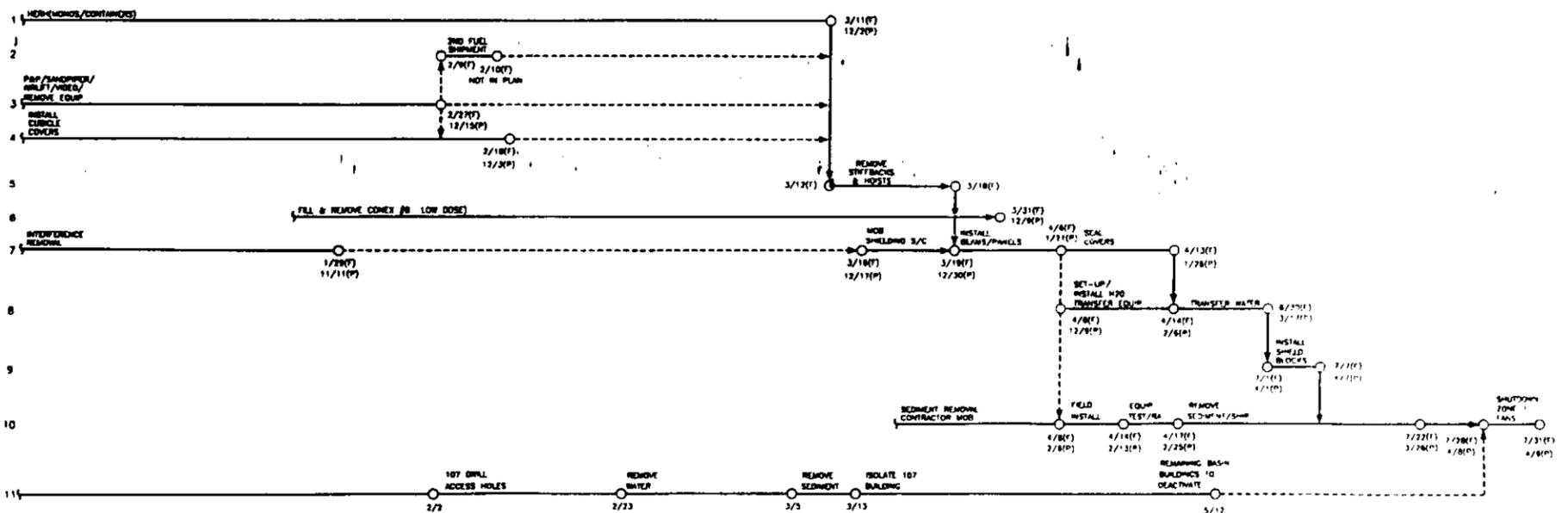
## DWP (10/1/97 DATA DATE)



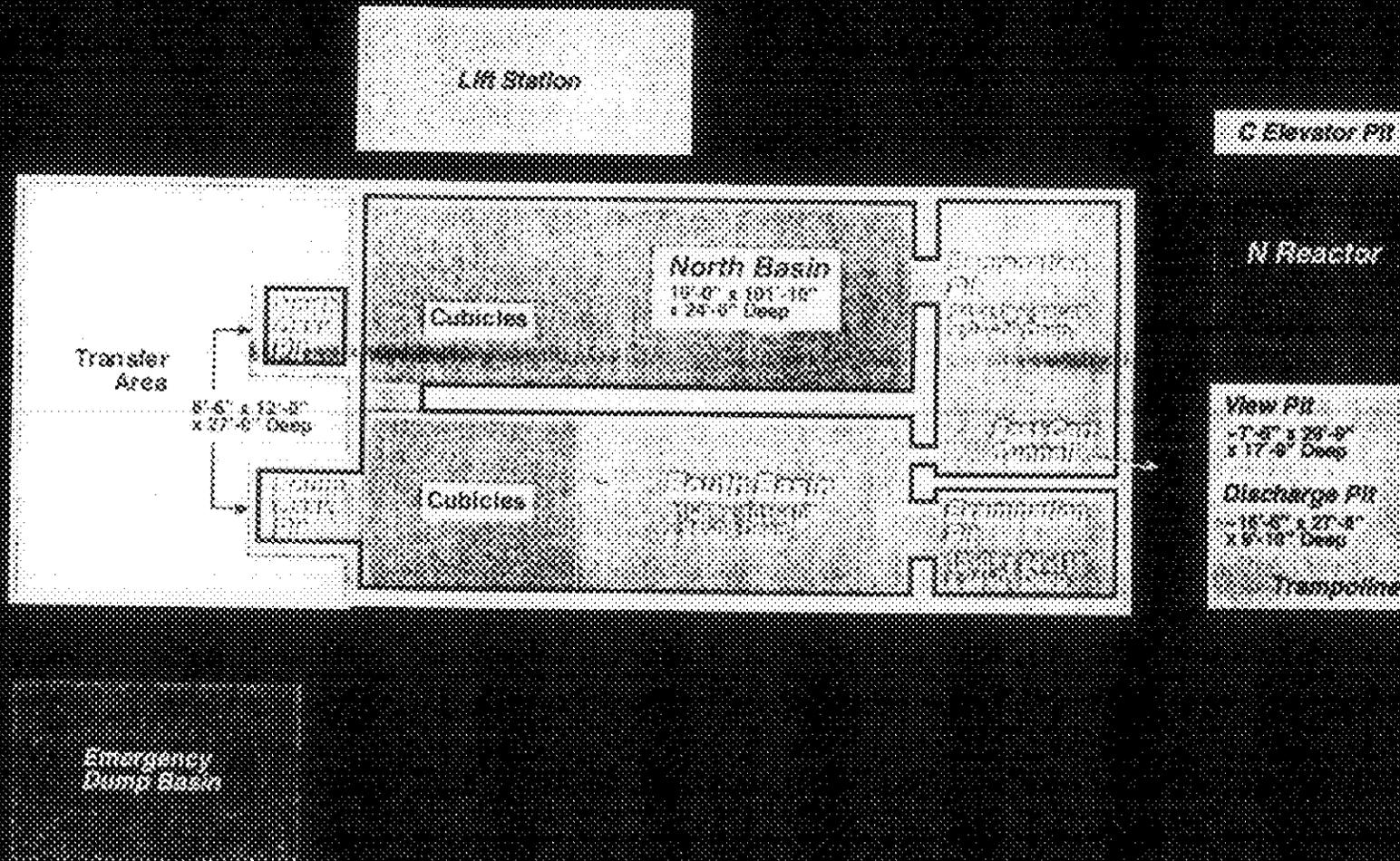
## DWP - BCP'S (SHIELDING & CARRYOVER) (10/28/97 DATA DATE)



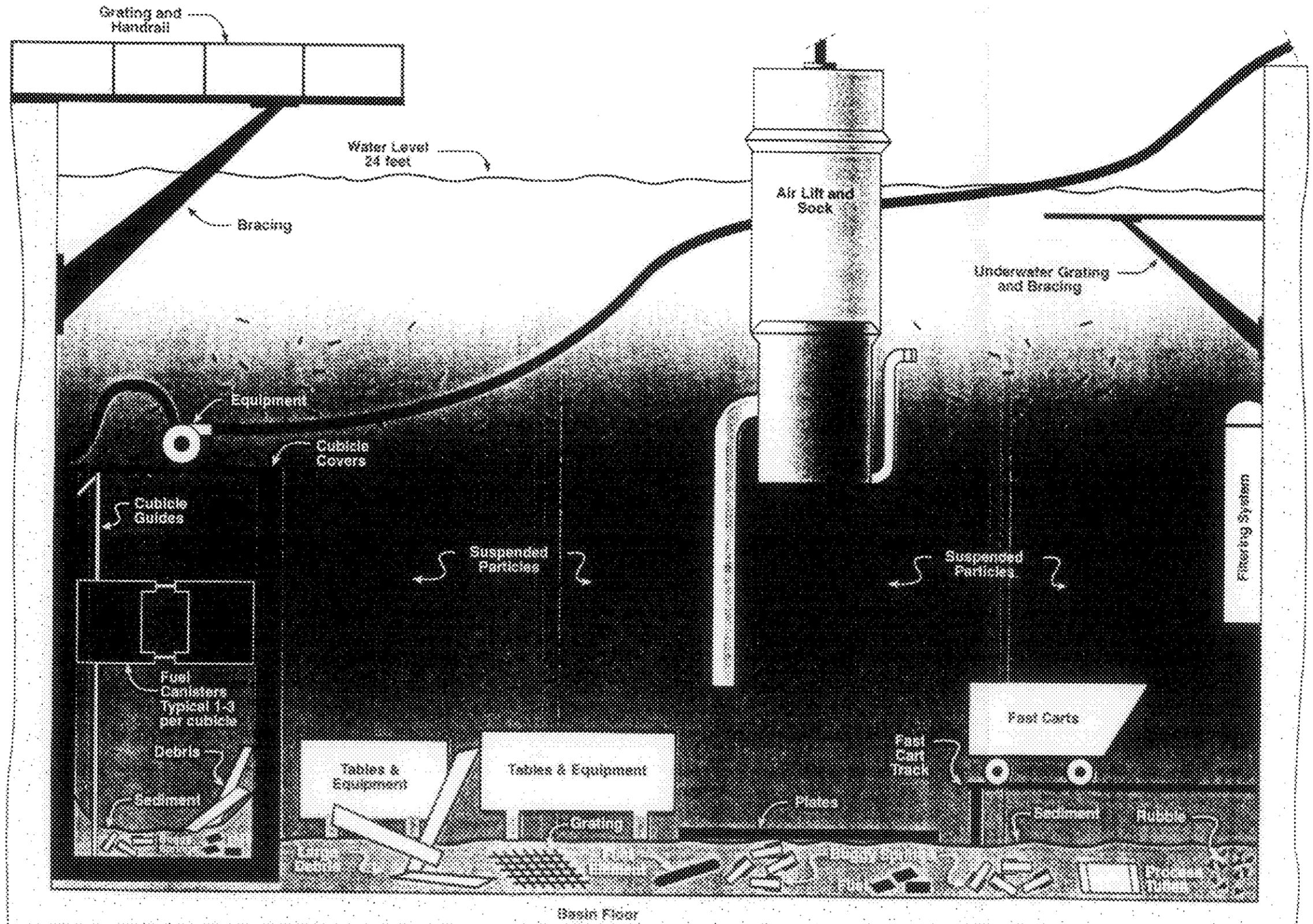
## CURRENT PROJECT FORECAST (1/28/98 DATA DATE)



# N Basin Plan View



# N Basin Cleanup Complexity



Total Cubicles - 1024  
Cubicle 22" x 12" x 7'-6"

**Process:**

1. Airlifted Numerous Cubicles
2. Aqua Dyne Crusted Sediment
3. Picked and Placed All Cubicles
4. Sandpiped/Airlifted All Cubicles
5. R07/Video
6. Dose 3.5#/hr or Greater for Fuel
7. Dose 1.5#/hr or Less for Shielding

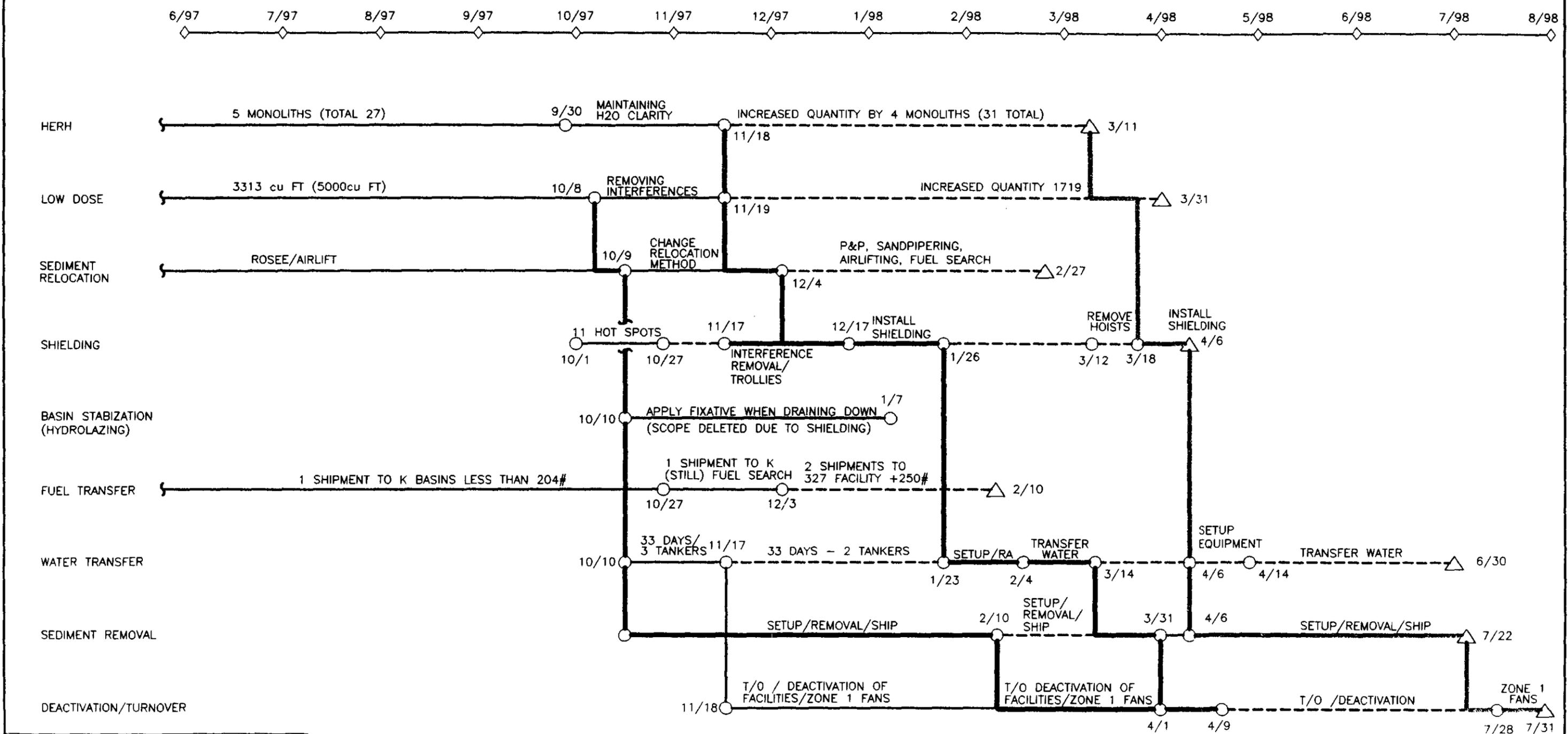
# N Area Project Completion Evolution

<u>Date</u>	<u>BHI Completion</u>	<u>TPA Date</u>
10/97 ( DWP )	3/18/98	4/01/98
11/97 ( DWP + Shielding ) (Scope Change)	4/09/98	4/01/98
2/98 ( New TPA Forecast ) (Scope Change)	7/14/98	7/31/98.



# N AREA PROJECT DWP VS FORECAST COMPLETION PLAN

PLAN DATE:  
FEBRUARY 2, 1998



**LEGEND**

- DWP CRITICAL PATH
- DWP/C/O/SHIELDING CRITICAL PATH
- CURRENT CRITICAL PATH

056086

# Hanford Environmental Restoration

**DOE / Ecology TPA Follow-up**

**N Area Project**

**February 5, 1998**

**Richland Operation Office  
Restoration Project**



**Bechtel Hanford, Inc.**  
Environmental Restoration Contractor



**Response to Phil Staats, Ecology Project Manager, Per attached cc: Mail**

1. What is driving the extension in the schedule?  
**Response: Several key factors have been delineated on the "Assumption Reconciliation and Schedule Evolution" attachment. The drivers include, but are not limited to, Shielding, Additional Waste Quantities, Craft Bumping, Sediment Removal and Water Removal (Off-loading rate at ETF).**
  
2. Why can't the sediment removal contractor be moved in parallel with other activities?  
**Response: The attachment "Evaluation of Sediment Concurrent with Shielding" lists the Pro's and Con's of Sediment Removal concurrent with other activities.**
  
3. What accounts for the increase in HERH from 6/97 = 24, 10/97 = 25, 12/97 = 27, and 2/98 = 31?  
**Response: (HERH is measured in Monoliths)**  
**6/97 = 21 HERH and 3-3M Filter**  
**10/97 = 22 HERH and 3-3M Filters (Added 1 - HERH for Lift Station Debris)**  
**12/97 = 22 HERH and 5-3M Filters (Added 2-3M Filters for Shielding Extension)**  
**2/98 = 24 HERH and 7-3M Filters (2 added for HERH, 2 added for 3M Filters)**
  
4. What accounts for low dose rate volume increases from 6/97 = 5,000 Cu. Ft. to 12/97 = 5,427 Cu. Ft. to 2/98 = 6,719 Cu. Ft.?  
**Response: The 5,000 Cu. Ft. was based on an inventory of debris and equipment identified in June 1997. This was based on material and equipment, in the basin or ancillary areas to be removed. In December 1997 the inventory was under reevaluation and the quantity of 5,427 was total amount removed. No increase to the Baseline was requested, as the remaining inventory was being evaluated. The final inventory was established in January 1998 and a BCP was submitted to increase the total to 6,719 Cu. Ft. This represents 4,974 Cu. Ft. of Low Dose Rate Material that existed in the Basin prior to cleanup operations. 1,745 Cu. Ft. of Low Dose Rate Material was attributed to cleanup work operations.**
  
5. What are the dates when the Authorization Basis were issued for HERH, Low Dose Rate Material Removal and Sediment Removal?  
**Response:**  
**HERH:**  
**Original Authorized 3/95 (BHI-00310)**  
**Re-authorized 6/20/96 (BHI-00862)**  
**Current Authorization 12/18/96 (BHI-00968)**  
**Low Dose Rate Material:**  
**Original Authorized 3/95 (BHI-00310)**  
**Suspended 6/96**  
**Re-Authorization 12/18/96 (BHI-00968)**  
**Sediment Removal:**  
**Original Authorization 12/18/96 (BHI-00968)**
  
6. When will written performance objectives be agreed to between N Project and ETF for receipt of water?  
**Response: A meeting has been set up for 2/5/98 to determine the requirements for the Memorandum of Understanding between N Project and ETF. An update will be provided as possible.**

2/5/98

Author: Phillip R Staats at -HANFORD02A  
Date: 2/4/98 10:39 AM  
Priority: Normal  
Receipt Requested  
TO: Paul M Pak at -HANFORD19A  
Subject: ???

----- Message Contents -----

Paul, only a few questions

- 1) What is driving the extension in the schedule?
- 2) Why can't the sediment removal contractor be moved in parallel with other activities?
- 3) What accounts for the increase in HERH from 6/97=24, 10/97=25, 12/97=27, 2/98=31?
- 4) What accounts for sediment volume increase from 6/97=5000ft<sup>3</sup>, 12/97=5427ft<sup>3</sup>, 2/98=6000ft<sup>3</sup>?
- 5) What are the dates when the authorizations were issued for HERH, low dose, sediment removal?
- 6) When will written performance objectives be agreed to between N Project and ETF for receipt of the water?

## N BASIN SHIELDING SCHEDULE IMPACT

- **Original Plan** – Apply Fixative to Basin Walls, Cubicles, and Basin Floor
  - 33 Days – Fixate Basin Walls and Equipment
  - 25 Days – Fixate Cubicles and Basin Floor
  - 58 Days – Total duration

*Only 12 days*, out of the 58-day total duration, *were other activities not being performed in parallel* (during fixating of Basin walls and equipment).

- **Current Plan** – Cover Basins with Concrete Shielding Panels
  - 9 Days – Install Support Beams
  - 10 Days – Install Concrete Cover Panels
  - 19 Days – Total duration

During the 19-day duration for installing the beams and panels no other critical path work can be performed in parallel due to the congested/limited space in the Basin area. Other activities associated with shielding installation (e.g., interference removal, etc.) can be performed in parallel with other basin activities.

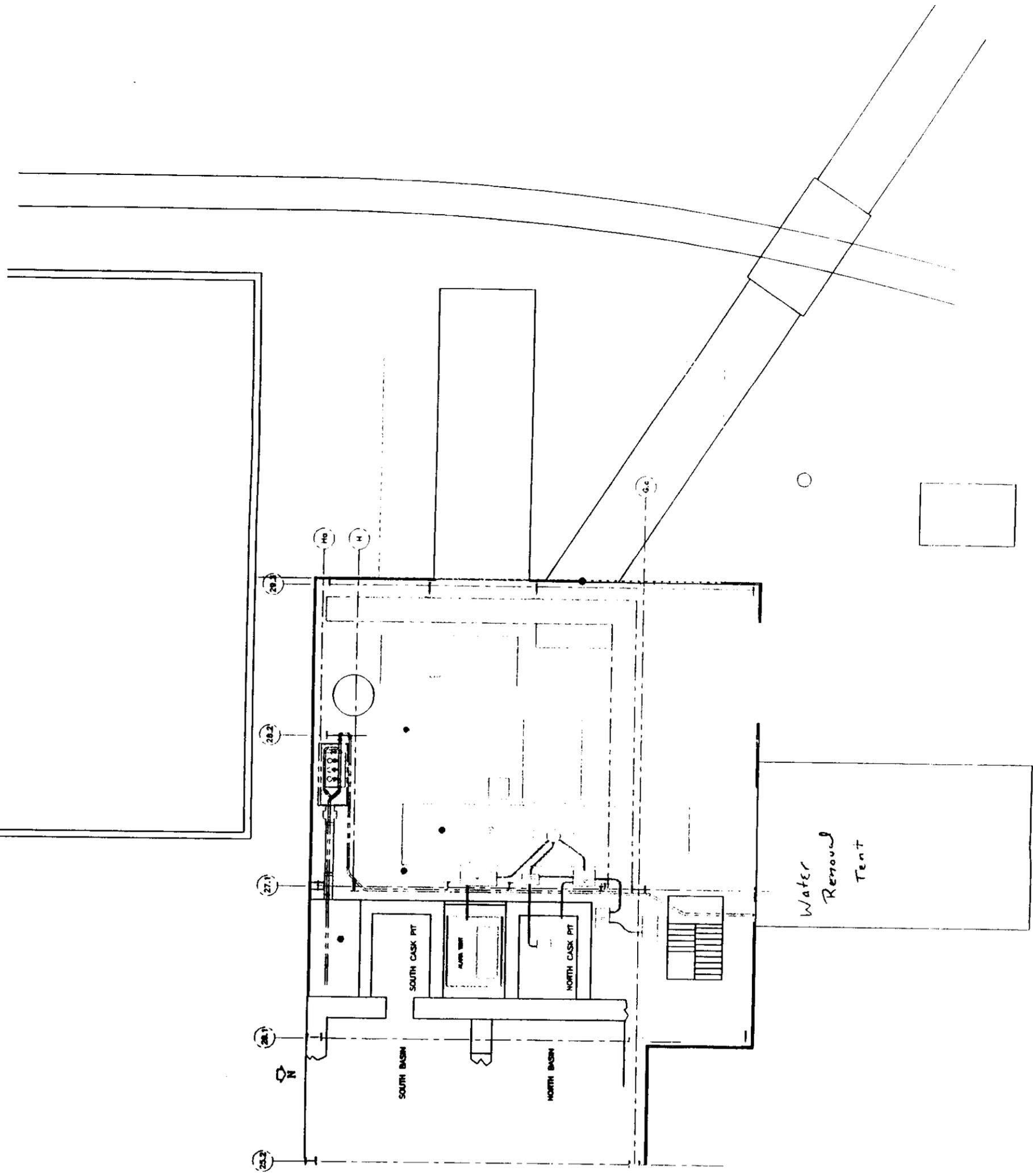
- **Schedule Impact**
  - 19 Days – Shielding Installation
  - -12 Days – Fixating Basin Walls
  - 7 Days – Schedule Impact (5-day work week *~1.5 wks*)



# Evaluation of Sediment Concurrent with Shielding

## Sediment Concurrent

PRO'S	CON'S
<ul style="list-style-type: none"><li>• Move float in sediment path</li><li>• Possible reduction in schedule if water transfer rate exceeds 6 tankers per day.</li></ul>	<ul style="list-style-type: none"><li>• Hazards Analysis (Seismic/Structural)</li><li>• Change notice to shielding, subcontract<ul style="list-style-type: none"><li>- Additional schedule time</li></ul></li><li>• Increased costs<ul style="list-style-type: none"><li>- Move well</li><li>- Place backfill</li><li>- Engineering structural evaluation</li><li>- Crane pad setup</li></ul></li><li>• Increased logistical considerations</li><li>• Erect enclosure (HEPA filtered)</li><li>• Will increase critical path</li></ul>



**HIGH EXPOSURE RATE HARDWARE (HERH)  
QUANTITY EVOLUTION**

	6/30/97	10/28/97	2/2/98
<b>Percent Complete</b>	<b>39%</b>	<b>71%</b>	<b>84%</b>
Estimated Quantity (Cu. Ft.)	4,080	4,590	5,270
<b>Estimate Variance</b>	<b>22%</b>	<b>13%</b>	<b>N/A</b>
Containers	24	27	31

**HIGH EXPOSURE RATE HARDWARE (HERH)  
MAKEUP**

	6/30/97	10/28/97	2/2/98	% Increase (Total)
<b>Basin Hardware (Cu. Ft.)</b>	<b>3,570</b>	<b>3,740</b>	<b>4,080</b>	<b>14%</b>
- % of Estimated Quantity	88%	82%	77%	
<b>Water Clarity Filters (Cu. Ft.)</b>	<b>510</b>	<b>850</b>	<b>1,190</b>	<b>133%</b>
- % of Estimated Quantity	12%	18%	23%	

NOTE: All quantities are packaged waste volumes for disposal at ERDF  
1 Container ~170 cu. ft.

**LOW DOSE HARDWARE  
QUANTITY EVOLUTION**

	6/30/97	10/1/97	10/28/97	12/31/97	2/2/98
<b>Percent Complete</b>	<b>25%</b>	71%	76%	85%	<b>90%</b>
Quantity Removed (Cu. Ft.)	1,687	4,768	5,086	5,699	6,083
Estimated Quantity (Cu. Ft.)	5,000*	5,000*	5,000*	5,000*	6,719

\* Estimated quantity of *Original Basin Waste* only

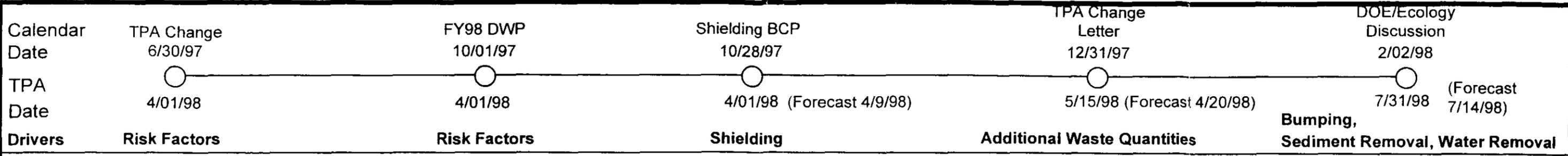
**LOW DOSE HARDWARE MAKEUP**

4,974	cu. ft.	Original Basin Waste
1,745	cu. ft.	Basin Cleanup Generated Waste
<u>6,719</u>	cu. ft.	Total Low Dose Waste

**ESTIMATE VARIANCE (ORIGINAL BASIN WASTE)**

**0.52%**

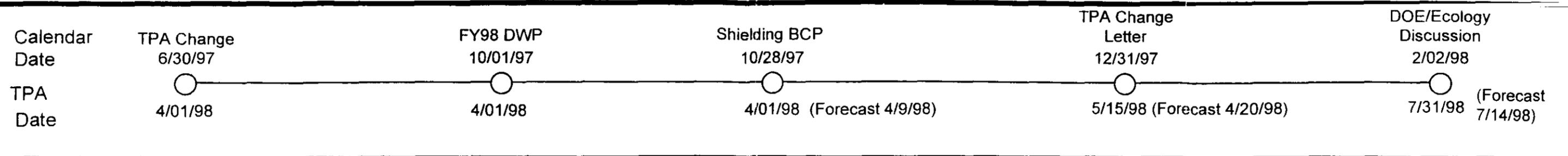
2/5/98



Drivers	Risk Factors	Risk Factors	Shielding	Additional Waste Quantities	Bumping, Sediment Removal, Water Removal
<p><b>Assumptions</b></p> <p><b>Sediment Removal</b></p> <ul style="list-style-type: none"> <li>- Phase II Sediment Sample Data will be similar to that of Phase I Sample Data</li> <li>- No change will be required in sediment subcontractor removal duration</li> </ul> <p><b>Water Draindown</b></p> <ul style="list-style-type: none"> <li>- Dose reduction can be achieved by the appropriate decontamination methodology (hydrolasing, power brushing, etc.)</li> <li>- Shielding of up to 15 hot spots as required</li> <li>- Dewatering activities will occur on 2 - 11 hour shifts per day, 6 days per week for 33 days</li> <li>- ETF can off-load and release 9 - 5,000 gallon tankers per day</li> <li>- ETF concurred offloading plan and schedule</li> </ul> <p><b>Craft "Bumping"</b></p> <ul style="list-style-type: none"> <li>- No allowance for schedule/cost impacts were added for craft "bumping"</li> </ul> <p><b>Stabilization</b></p> <ul style="list-style-type: none"> <li>- AquaDyne surfaces at 2,500 PSI to achieve required dose prior to application of fixative</li> <li>- Fixative will be applied to N Basin surfaces for airborne and dose contamination control</li> </ul>	<p><b>Assumptions</b></p> <p><b>Sediment Removal</b></p> <ul style="list-style-type: none"> <li>- Phase II Sediment Sample Data will be similar to that of Phase I Sample Data</li> <li>- No change will be required in sediment subcontractor removal duration</li> </ul> <p><b>Water Draindown</b></p> <ul style="list-style-type: none"> <li>- Dose reduction can be achieved by the appropriate decontamination methodology (hydrolasing, power brushing, etc.)</li> <li>- Shielding of up to 15 hot spots as required</li> <li>- Dewatering activities will occur on 2 - 11 hour shifts per day, 6 days per week for 33 days</li> <li>- ETF can off-load and release 9 - 5,000 gallon tankers per day</li> <li>- ETF concurred offloading plan and schedule</li> </ul> <p><b>Craft "Bumping"</b></p> <ul style="list-style-type: none"> <li>- No allowance for schedule/cost impacts were added for craft "bumping"</li> </ul> <p><b>Stabilization</b></p> <ul style="list-style-type: none"> <li>- AquaDyne surfaces at 2,500 PSI to achieve required dose prior to application of fixative</li> <li>- Fixative will be applied to N Basin surfaces for airborne and dose contamination control</li> <li>- Fixative application will occur simultaneous with water draindown</li> </ul>	<p><b>Assumptions</b></p> <p><b>Sediment Removal</b></p> <ul style="list-style-type: none"> <li>- Phase II Sediment Sample Data will be similar to that of Phase I Sample Data</li> <li>- No change will be required in sediment subcontractor removal duration</li> </ul> <p><b>Water Draindown</b></p> <ul style="list-style-type: none"> <li>- Dose reduction will be achieved by covering the North and South Basins, Segregation pit, Examination pit, and South load-out Pit with 99 - 12" thick, concrete panels, placed on 33 - 14" I-Beams.</li> <li>- 25" steel plates will be placed on the cubicles for airborne contamination control</li> <li>- Dewatering activities will occur on 2 - 11 hour shifts per day, 6 days per week for 33 days</li> <li>- ETF can off-load and release 9 - 5,000 gallon tankers per day</li> <li>- ETF concurred offloading plan and schedule</li> </ul> <p><b>Craft "Bumping"</b></p> <ul style="list-style-type: none"> <li>- No allowance for schedule/cost impacts were added for craft "bumping"</li> </ul> <p><b>Stabilization</b></p> <ul style="list-style-type: none"> <li>- AquaDyne surfaces at 2,500 PSI is inadequate in achieving required dose reduction prior to application of fixative. Testing unsuccessfully completed at 10,000 PSI.</li> <li>- Fixative will be applied to the tunnel in Zone 1 only, during draindown.</li> <li>- Fixative application to basin floors, walls and cubicles replaced with precast concrete shielding as listed above</li> </ul> <p><b>Low Dose Rate Hardware Removal</b></p> <ul style="list-style-type: none"> <li>- Additional quantities of Low Dose Rate material identified due to removal of interferences for shielding installation</li> <li>- In the process of quantifying, trend issued to reflect 5,686 Cu. Ft. of Low Dose Rate Hardware</li> </ul>	<p><b>Assumptions</b></p> <p><b>Sediment Removal</b></p> <ul style="list-style-type: none"> <li>- Phase II Sediment Sample Data will be similar to that of Phase I Sample Data</li> <li>- No change will be required in sediment subcontractor removal duration</li> </ul> <p><b>Water Draindown</b></p> <ul style="list-style-type: none"> <li>- Dose reduction will be achieved by covering the North and South Basins, Segregation pit, Examination pit, and South load-out Pit with 99- 12" thick, concrete panels, place on 33 - 14" I-Beams.</li> <li>- 25" steel plates will be placed on the cubicles for airborne contamination control</li> <li>- Dewatering activities will occur on 2 - 11 hour shifts per day, 6 days per week for 33 days</li> <li>- ETF can off-load and release 9 - 5,000 gallon tankers per day</li> <li>- ETF concurred offloading plan and schedule</li> </ul> <p><b>Craft "Bumping"</b></p> <ul style="list-style-type: none"> <li>- No allowance for schedule/cost impacts were added for craft "bumping"</li> </ul> <p><b>Stabilization</b></p> <ul style="list-style-type: none"> <li>- Application of fixative to Basin floors, walls and cubicles removed from cost and schedule baselines.</li> <li>- Fixative will be applied to the tunnel in Zone 1 only, during draindown</li> <li>- Fixative application to basin floors, walls and cubicles replaced with precast concrete shielding as listed above</li> </ul> <p><b>Low Dose Rate and High Exposure Rate Hardware (HERH) Removal</b></p> <ul style="list-style-type: none"> <li>- Additional quantities of HERH and Low Dose Rate material discovered below crusted sediment layer in Basin cubicles and open areas</li> <li>- In the process of quantifying, trend issued to reflect 5,811 Cu. Ft. of Low Dose Rate Hardware</li> </ul>	<p><b>Assumptions</b></p> <p><b>Sediment Removal</b></p> <ul style="list-style-type: none"> <li>- Phase II Sediment Sample Data considered different than Phase I Data. Radionuclides higher than planned requiring more packaging to accommodate TRU content and reduce dose rate.</li> <li>- 22+ liners; an additional 14+ liners, with extended duration to 8 weeks (3 original for additional liners)</li> </ul> <p><b>Water Draindown</b></p> <ul style="list-style-type: none"> <li>- Dose reduction will be achieved by covering the North and South Basins, Segregation pit, Examination pit, and South load-out Pit with 99- 12" thick, concrete panels, place on 33 - 14" I-Beams.</li> <li>- 25" steel plates will be placed on the cubicles for airborne contamination control</li> <li>- Dewatering activities will occur on 2 - 11 hour shifts per day, 6 days per week for 66 days</li> <li>- ETF can off-load and release 4 - 4,500 gallon tankers per day</li> <li>- Revised based on discussions and history from ETF</li> </ul> <p><b>Craft "Bumping"</b></p> <ul style="list-style-type: none"> <li>- Craft bumping has impacted the project by 2.5 weeks, based on the loss of 12 of current 250 workers</li> </ul> <p><b>Stabilization</b></p> <ul style="list-style-type: none"> <li>- Application of fixative to Basin floors, walls and cubicles removed from cost and schedule baselines</li> <li>- Fixative will be applied to the tunnel in Zone 1 only, during draindown</li> <li>- Fixative application to basin floors, walls and cubicles replaced with precast concrete shielding as listed above</li> </ul> <p><b>Low Dose Rate and High Exposure Rate Hardware (HERH) Removal</b></p> <ul style="list-style-type: none"> <li>- Additional quantities of HERH and Low Dose Rate debris discovered below crusted sediment layer in Basin cubicles and open areas</li> <li>- HERH increased from 27 to 31 Monoliths (2 mono's for debris and 2 mono's for water filters)</li> <li>- Low Dose increased from 5,000 to 6,719 CU. FT.</li> </ul>	

**N Area Project  
 Assumption Reconciliation  
 and Schedule Evolution**

**Bold and Italics indicate Changes**



Assumptions

Water Clarity

- Maintain and Recover water clarity in a timely manner during work operations
- 3M Filter Disposal Optimized

ROSEE

- Optimize suction capacity

Airlift

- Determine settling rate of particulates in effecting water clarity
- Determined optimized air pressure and flow

Assumptions

Water Clarity

- Water clarity will be achieved and maintained through water draindown

ROSEE

***ROSEE will be used for removal of sediment from cubicles and transfer of sediment from air lift filter socks***

Airlift

***Air lift will be used for small debris removal, along with sediment collection from basin open areas***

Assumptions

Water Clarity

- Water clarity will be achieved and maintained through initiation of shielding installation

***Extended water clarity maintenance requires additional 2 Million lbs for 3M filter disposal***

ROSEE

- ROSEE will be used for removal of sediment from cubicles and transfer of sediment from air lift filter socks

Airlift

- Air lift will be used for small debris removal, along with sediment collection from basin open areas

Assumptions

Water Clarity

- Water clarity will be achieved and maintained through initiation of shielding installation

ROSEE

***ROSEE inadequate for sediment and small debris removal***  
***Removed from service November 10, 1997***

Airlift

***Air lift will be used for small debris removal***  
***Three phased approach now used for sediment relocation activities: Pick & Place, Sandpiper, and Video/R07***

Assumptions

Water Clarity

- Water clarity will be achieved and maintained through initiation of shielding installation

ROSEE

- Removed from service November 10, 1997

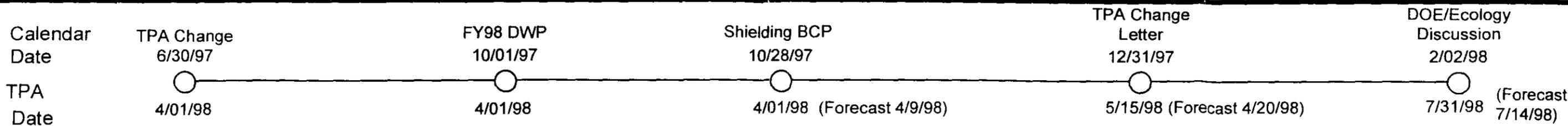
Airlift

- Air lift will be used for small debris removal
- Three phased approach now used for sediment relocation activities: Pick & Place, Sandpiper, and Video/R07

**N Area Project  
Assumption Reconciliation  
and Schedule Evolution**

**Page 2 of 2  
2/3/98**

**Bold and Italics indicate Changes**



**Quantities**  
**HERH - 21 HERH**  
**3 Water Clarity**  
 Total 24 Mono's  
 To Date 12 Mono's  
 To Go 12 Mono's

**Low Dose**  
 Total 5,000 Cu. Ft.  
 To Date 1,687 Cu. Ft.  
 To Go 3,313 Cu. Ft.

**Sediment Relocation**  
 Total 5,946 Sq. Ft.  
 To Date 1,338 Sq. Ft.  
 To Go 4,608 Sq. Ft.

**Cubicle Canister Guides**  
 Total 1,176  
 To Date 323  
 To Go 853

**Quantities**  
**HERH - 21 HERH**  
**3 Water Clarity**  
 Total 24 Mono's  
 To Date 21 Mono's  
 To Go 3 Mono's

**Low Dose**  
 Total 5,000 Cu. Ft.  
 To Date 4,768 Cu. Ft.  
 To Go 232 Cu. Ft.

**Sediment Relocation**  
 Total 5,946 Sq. Ft.  
 To Date 1,338 Sq. Ft. (Rework Areas)  
 To Go 4,608 Sq. Ft.

**Cubicle Canister Guides**  
 Total 1,176  
 To Date 935  
 To Go 241

**Quantities**  
**HERH - 22 HERH**  
**5 Water Clarity**  
 Total 27 Mono's  
 To Date 22 Mono's  
 To Go 5 Mono's

①

②

**Low Dose**  
 Total 5,000 Cu. Ft.  
 To Date 5,086 Cu. Ft.  
 To Go 600 Cu. Ft.

**Sediment Relocation**  
 Total 5,946 Sq. Ft.  
 To Date 1,830 Sq. Ft.  
 To Go 4,116 Sq. Ft.

**Cubicle Canister Guides**  
 Total 1,176  
 To Date 935  
 To Go 241

**Concrete Panels I-Beams**  
 Total 99 Total 33  
 To Date 0 To Date 0  
 To Go 99 To Go 33

**Cubicle Shielding Covers**  
 Total 93  
 To Date 0  
 To Go 93

**Justification for Quantity Change**  
 BCP 98020 - Added Shielding Scope  
 - Interference Removal (Low Dose)  
 - Additional:  
 99 Concrete shielding panels  
 33 Steel I-Beams  
 93 Steel Cubicle Covers  
 Changes in HERH due to 2 added Mono's for 3M Filters and 1 added mono for Lift Station HERH (New Scope)

①

②

**Quantities**  
**HERH - 22 HERH**  
**5 Water Clarity**  
 Total 27 Mono's  
 To Date 24 Mono's  
 To Go 3 Mono's

①

①

**Low Dose**  
 Total 5,000 Cu. Ft.  
 To Date 5,699 Cu. Ft.  
 To Go 112 Cu. Ft.

**Sediment Relocation**  
 Total 5,946 Sq. Ft.  
 To Date 4,616 Sq. Ft.  
 To Go 1,330 Sq. Ft.

**Cubicle Canister Guides**  
 Total 1,176  
 To Date 1,176  
 To Go Complete

**Concrete Panels I-Beams**  
 Total 99 Total 33  
 To Date 0 To Date 0  
 To Go 99 To Go 33

**Cubicle Shielding Covers**  
 Total 93  
 To Date 1  
 To Go 92

**Justification for Quantity Change**  
 ① - Low Dose Volume increased by shielding interference removal (inventory not finalized)  
 ② - Change in method of cubicle sediment relocation to three phased approach:  
 a. Pick & Place  
 b. Sandpiper  
 c. Video/R07  
 (plus repeat above steps as required)  
 - Trend initiated for additional 2 mono's for HERH and 2 mono's for 3M Filter Disposal

①

②

**Quantities**  
**HERH - 24 HERH**  
**7 Water Clarity**  
 Total 31 Mono's  
 To Date 26 Mono's  
 To Go 5 Mono's

①

②

**Low Dose**  
 Total 6,719 Cu. Ft.  
 To Date 6,083 Cu. Ft.  
 To Go 636 Cu. Ft.

**Sediment Relocation**  
 Total 5,946 Sq. Ft.  
 To Date 4,385 Sq. Ft.  
 To Go 1,561 Sq. Ft.

**Cubicle Canister Guides**  
 Total 1,176  
 To Date 1,176  
 To Go Complete

**Concrete Panels I-Beams**  
 Total 99 Total 33  
 To Date 0 To Date 0  
 To Go 99 To Go 33

**Cubicle Shielding Covers**  
 Total 93  
 To Date 1  
 To Go 92

**Justification for Quantity Change**  
 ① - HERH Mono's increase by 2 for waste discovered below sediment layer and 2 for added 3M water filters  
 ② - Reconciliation of Low Dose completed for actual plus to go quantities:  
**4,974 Cu. Ft. discovered existing waste**  
**1,745 Cu. Ft. generated by operations**  
 ③ - Quantity "To Date" adjusted to reflect revised end point criteria

①

②

③

**N Area Project**  
**Quantity Reconciliation**  
**and Schedule Evolution**  
**2/3/98**