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Section 1 of 2

Document Information

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

C. C. Haass

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U.S. Department of Energy Contract DE-AC06-~~96RL19200~~ ^{99RL-14047}

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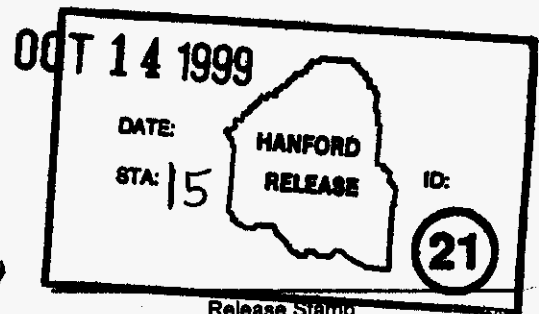
Key Words: Vadose Zone, Engineering Report, Interim Measures, Single-Shell Tank Farms, 200W, 200E

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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Karen A. Noland 10/14/99
Release Approval Date



Approved For Public Release

LOCKHEED MARTIN



October 14, 1999

LMHC-9956571

Mr. J. A. Poppiti, Director
Program Development Division
U.S. Department of Energy
Office of River Protection
Post Office Box 550
Richland, Washington 99352

Dear Mr. Poppiti:

CONTRACT NUMBER DE-AC06-99RL14047; COMPLETION OF TRI-PARTY AGREEMENT PROPOSED TARGET DATE COMMITMENT M-45-56-T01; AND PARTIAL RESPONSE TO THE U.S. GENERAL ACCOUNTING OFFICE AUDIT REPORT NUMBER GAO/RCED-89-157, DATED JULY 7, 1989, THE U.S. DEPARTMENT OF ENERGY AUDIT REPORT TRACKING SYSTEM REPORT NUMBER 89-007, RECOMMENDATION NUMBER THREE

Attached is the document, "Engineering Report Single-Shell Tank Farms Interim Remedial Corrective Action." Submittal of this report to the Washington State Department of Ecology by October 29, 1999, will complete the Tri-Party Agreement proposed Target Date Commitment M-45-56-T01, "Summarize results of engineering studies and recommendations on isolating water lines in or near SST WMAs, sealing abandoned wells in or near SST WMAs, and controlling surface drainage at SST WMAs and submit results to Ecology."

This document is also a partial response to the U.S. General Accounting Office Audit Report Number GAO/RCED-89-157, July 7, 1989; the U.S. Department of Energy (DOE) Audit Report Tracking System Report Number 89-007, "Nuclear Waste: DOE's Management of Single-Shell Tanks at Hanford, Washington," Recommendation Number 3: "Develop specific plans to replace the gravel surfaces at the tank farms with a less permeable material and promptly replace the gravel surfaces if ongoing studies indicate that these surfaces could promote the movement of waste toward the groundwater."

If you have any questions or require further information, please contact Ms. C. C. Haass on 372-0803.

Very truly yours,

H. L. Boston, Vice President and Director
Tank Waste Retrieval and Disposal
LMHC River Protection Project

jej

Attachment

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ENGINEERING REPORT

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

October 1999

Subcontract LMHC 96WO-0006

Prepared by

**Fluor Daniel Northwest
Richland, Washington**

Prepared for

Lockheed Martin Hanford Corporation

ENGINEERING REPORT

SINGLE-SHELL TANK FARMS

INTERIM MEASURES TO LIMIT

INFILTRATION THROUGH THE VADOSE ZONE

APPROVAL


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10/13/99
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Date


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10/13/99
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LOCKHEED MARTIN HANFORD CORPORATION

Tank Farm Vadose Zone Program

Date

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ATTACHMENTS

- Attachment I. WATER LINE ASSESSMENT
- Attachment II. WELL ASSESSMENT
- Attachment III. SURFACE WATER ASSESSMENT

ACRONYM LISTING

ALARA - As low as reasonably achievable

BHI - Bechtel Hanford, Incorporated

CAMIS - Computer Automated Mapping Information System

CCS - Clean, controlled and stable

CHI - CH₂ MHill, Incorporated

CMS - Corrective Measures Study

D&D - Decontamination and decommissioning

DOE – U. S. Department of Energy

ECN - Engineering change notice

EPA - Environmental Protection Agency

ES - Engineering sketches

FDH - Fluor Daniel Hanford, Incorporated

FDNW - Fluor Daniel Northwest, Incorporated

FFU - Fitness-for-use

GPR - Ground penetrating radar

HPT - Health physics technician

IP - Intrusion prevention

IS - Interim stabilized

LF – Linear foot

LMHC - Lockheed Martin Hanford Corporation

MACTEC - MAC Technical Services Company

NHC - Numatec Hanford Corporation

PITT - Partitioning inter-well tracer testing

PNNL - Pacific Northwest National Laboratory

PW - Potable water

RCRA - Resource Conservation Recovery Act

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

WHC - Westinghouse Hanford Company

WMA - Waste management area

WMNW - Waste Management Federal Services, Inc., Northwest Operations

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 located in the 200-West and 200-East Areas of the Hanford Site for viable cost-effective means to eliminate leaking water lines, reduce the number of wells within the SST farm areas, and reduce surface water infiltration.

Operation activities within the Hanford Site SST farms have contributed to contamination of the soil above, around, and below the SSTs. Studies by Gee and Tyler show that any water added to the soil column contributes to the continued migration of this contamination through the soil column above groundwater, referred to as the vadose zone, and ultimately into the groundwater.

The 149 SSTs on the Hanford Site are hazardous waste management units grouped into 12 tank farms that contain from 4 to 18 tanks per farm. The 12 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). 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* (Appendix B). The seven WMAs are part of six larger operable units. The WMAs are: A-AX and C; B-BX-BY; S-SX; T; TX-TY; and U. 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.

Hanford Site Location Map

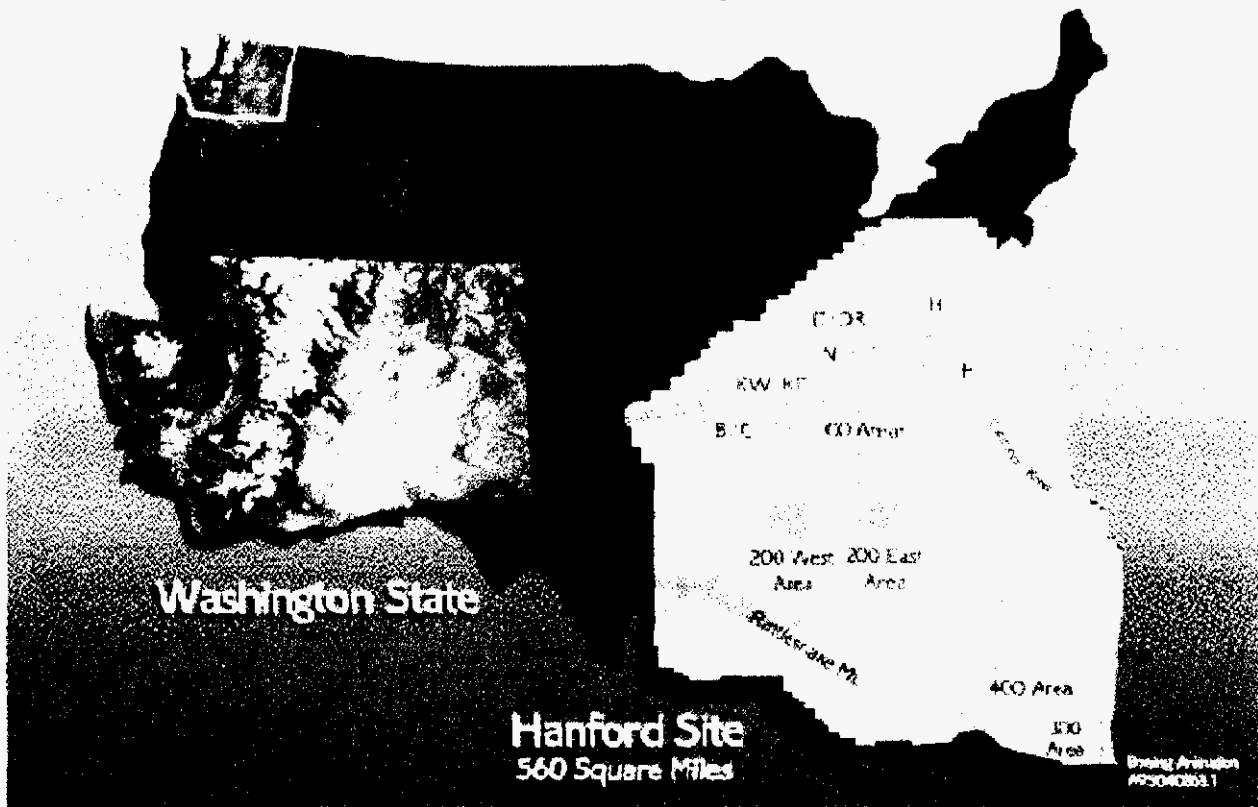


Figure 1, HANFORD SITE LOCATION MAP

1.1 BACKGROUND

The magnitude and effects of surface water and leaking water lines are emphasized by local soils. *The porous sandy-gravel soil allows moisture to quickly enter and migrate downward through the vadose zone and into the groundwater.* These sandy soils also have an insulating effect (there is minimal upward capillary action). Even when the surface is extremely dry from evaporation, the soil is relatively damp a short distance below the surface. Following is a description of the magnitude of the problem for the three sections of this report: water lines, wells, and surface water control.

1.1.1 Water Lines

Existing 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 old water line mains are mostly ductile or cast iron some with lead joints while the smaller service lines are galvanized steel. Some joints are leaking due to time, soil settlement deterioration, and operations. Some old galvanized steel water lines are also leaking due to corrosion. There have been no leak volume estimates or tests for the tank farm water lines, but the volume is considered to be substantial. 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 major problem with the majority of the leaks in the water lines is that the leaks are not visible on the ground surface due to the porous soils and downward water migration. The water purveyor has found that 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 waterline ruptures. According to the water utility purveyor, approximately four major water line breaks a year are expected to occur in the 200-East or 200-West Areas.

1.1.2 Wells

The wells are not a direct contributor to vadose zone water; rather they provide a potential preferential pathway for the rapid downward movement of contamination through the vadose zone. The construction of almost all of 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*.

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 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.

Two steps are taken during well installation to prevent this situation from developing. A cement cap is placed around the well near the ground surface, and then 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 WAC 173-160.

This situation is made worse in many of the SST Farm wells because 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. Roughly, 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 all the tank farms. Although the vadose zone wells do not go directly to groundwater, they do reduce the migration time by providing a preferential path along the well casing for 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 838 wells within the limits of the 12 SST farms. Twelve of these wells have been decommissioned in accordance with Washington Administrative Code (WAC) 173-160. There are 20 groundwater wells and 12 wells that have been abandoned in place with unknown closure, included in this total.

1.1.3 Surface Water

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

The magnitude of normal precipitation varies significantly. The average annual precipitation at the site is 6.83 in. 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 in. per year. Excess moisture occurs primarily because during the months when the site is receiving the majority of its precipitation (November, December, and January), these are the same months with minimal ET. During an average year, there is excess precipitation of 3/4 in., and during wetter than normal months and seasons, this excess is even greater. This yearly phenomenon contributes greatly to the continued migration of contamination through the vadose zone.

The second surface water factor considered is catastrophic events. Although catastrophic events occur on a less frequent basis, the effects can be significant. The volume of water added to the vadose zone has a potential of being extremely large. In September 1996, a 14-in. water line ruptured in the vicinity of Tank Farms S and SY, and within 2 hours, 550,000 gallons of water spilled onto the ground surface. Then in a relative short period of time (less than 24 hrs), this water had dissipated into the ground.

A second catastrophic event could 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 provides for a rapid snowmelt, thereby flooding the low-lying farms.

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 and contaminant infiltration into the soil column and limit contaminant migration through the vadose zone. The report supports Tri-Party Agreement (TPA) milestone P (M)-45-56-T01, as created by draft change request M-45-98-03.

2.0 APPROACH/EVALUATION

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 for each assessment are the tank farm fences for the surface water and well assessments. The water line assessment included an additional 150 m (500 ft) outside the farm fences.

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.

An extensive database was developed for this report. It encompasses anecdotal information, historical reports and specifications, drawings, aerial photos, interviews with recognized Site experts, and various contractor historical records. Many discrepancies and much of the conflicting information retained by the numerous organizations responsible for the various elements within the scope of this report have been resolved 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 the Washington State Storm Water Permit ST 4510 for stormwater removal. A new permit may be required.

Some information presented in Table 3.0-1 is located in various parts of the attachments. Specific areas of potential ponding can be found on the tank farm sketches in Appendix D of Attachment III. The cost to install run-on barriers on all farms (except BY Farm) is shown in Table 3.3.2 and in Table III-6.4-1 in Attachment III.

Table 3.0-1

PONDING/FLOODING AND BARRIER INSTALLATIONS

SST FARM	(PONDING) CLOSED DEPRESSIONS	FLOODING DUE TO PIPE BREAK	(*) FLOODING DUE TO METEOROLOGICAL CONDITIONS (ANECDOTAL*)	REGULAR FLOODING DUE TO RAIN (ANECDOTAL*)	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	1996***			X
T	X		(**)		X
TX	X				X
TY	X				X
U	X			Nov-Feb	X

* Information contained is anecdotal, based on interviews with Site personnel. No documentation is available.

** This occurred once in the late 70s or early 80s.

*** Found in Type C Investigation (flooding occurred in SY Farm also.)

**** Sanitary water line break, RL-WHC-TANKFARM-1991-0175.

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 27 000 m (88,500 ft) of lines vary in diameter from 1/2-to 24-in. Drawings and details of all the SST farm water lines are included in Attachment I.

The two water line types are active and 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, T, TX, and U Tank Farms for the interim stabilization program. In the future, water will be required in all farms to support retrieval operations.

All active water lines within the SST farm fence should be abandoned due to deterioration caused by the age of the water lines, existing underground leaks and corrosion. Further justification is the cost to repair, difficulty to repair the lines, potential volume attributed to leaks, reduced need for water in the farms and the possibility of leaks underground going undetected. Photographs 1 and 2 show typical examples of tuberculation and corrosion damaged water line conditions 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.

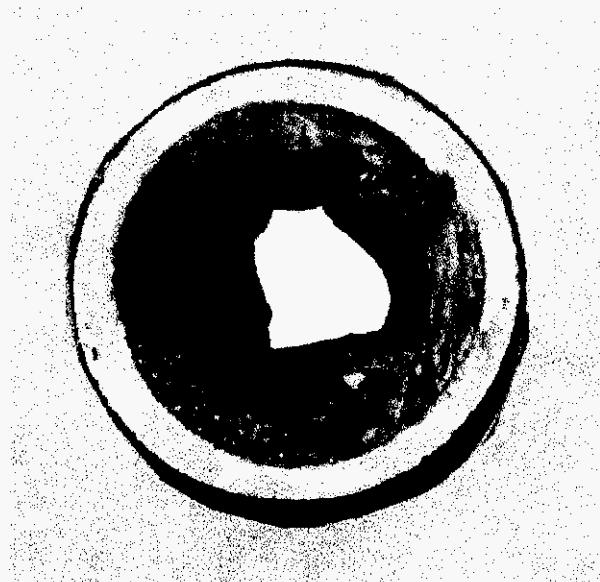


Photo 1
TUBERCULATION BUILDUP INSIDE POTABLE WATER LINE



Photo 2
HOLE
CORROSION-GALVANIZED WATER LINE

3.1.2 Conclusions

All active water lines inside the SST farm fence should be explored 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 excavated to confirm that these lines are active or the drawings should be updated to reflect that they are inactive. This exploration 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.
- All water lines abandoned in place.
- Fill abandoned-in-place water lines with grout.

Table 3.1-1 provides a comparison of advantages and disadvantages of the alternatives, by number. Water line assessment alternative costs are shown in Table 3.1-2. These tables are also 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 3.1-2. The number of lines to be maintained is unknown, since some or

all lines may be abandoned. The duration and schedule of the need for the tanker trucks is also unknown. These costs may be addressed after the water line exploration is completed.

3.1.3 Recommendations

The initial action is to confirm the limits of active versus inactive lines by doing water line exploration. This entails a detailed walkdown of all lines within the scope of this study including the lines outside the SST farm fence, that are not clearly documented as cut and capped. Based on the rationale discussed in summary section 3.1.1, the first recommendation is that all 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 at the supply main. As water is needed within the SST farm, it could be supplied by either truck or over-ground supply lines.

The study also evaluated the water lines outside the SST farm limits located within 150 m (500 ft) of a tank farm. The 6 700 m (22,000 ft) of water lines located in this outer area are primarily 6-in. and larger main lines. If a rupture in a line occurs, a considerable volume of water could flood the tank farm. Therefore, a graded approach is recommended to address the water lines outside the SST farms. A review 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 replaced outside the area of influence of the tank farms.

Project W-519 will install approximately 725 m (2,400 ft) of new DN150 (6-in.) pipe to provide infrastructure services to the privatization site. This line will be installed on the northern boundary of C Tank Farm, paralleling an existing 12-in. RW line. Industry standard construction techniques and materials will be specified that permit minimal joint leakage during the hydrostatic testing of the newly placed line. The vadose zone program

needs to be aware of this potential and coordinate where applicable, future construction activities of this nature.

Table 3.1-1*

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: \$186K	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: \$44.4M	Eliminates potential source of water to vadose zone	Large waste volume for disposal
	Objectives of engineering study achieved	Extensive HPT coverage required
	Easy to prioritize work	Long schedule
		May require confined space work
Labor intensive		
3. Water Lines Abandoned in Place Estimated cost: \$325K	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	HPT coverage required
	Small sections of pipe exposed at any one time	
4. Grout-fill Abandoned Water Lines Estimated cost: \$630K	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 HPT coverage

*This table is duplicated in Attachment I (Table I-6.1-1)

Table 3.1-2*

WATERLINE ASSESSMENT ALTERNATIVE COSTS
(\$ x 1000)

TANK FARM	WATER LINE EXPLORATION	ACTIVE WATER LINES		INACTIVE WATER LINES		ALT 2 REMOVE PIPE	ALT 3 CUT, CAP, ABD. PIPE	ALT 4 GROUT PIPE
		M	Ft	M	Ft			
A	\$ 25	2 289	7,508	1 220	4,002	\$ 5,335	\$ 43	\$ 118
AX	\$ 13	2 998	9,833	216	708	\$ 4,802	\$ 22	\$ 40
B	\$ 13	1 671	5,481	1 313	4,307	\$ 5,776	\$ 22	\$ 36
BX	\$ 13	704	2,309	1 229	4,031	\$ 2,965	\$ 22	\$ 38
BY	\$ 13	0	0	1 955	6,412	\$ 3,331	\$ 22	\$ 36
C	\$ 13	1 304	4,277	1 186	3,890	\$ 3,418	\$ 22	\$ 36
S	\$ 13	1 430	4,690	827	2,713	\$ 2,714	\$ 22	\$ 76
SX	\$ 26	501	1,643	1 084	3,556	\$ 2,641	\$ 46	\$ 87
T	\$ 13	0	0	1 162	3,811	\$ 2,037	\$ 22	\$ 33
TX	\$ 26	478	1,568	3 273	10,735	\$ 7,276	\$ 46	\$ 80
TY	\$ 5	0	0	740	2,427	\$ 1,435	\$ 13	\$ 18
U	\$ 13	448	1,469	949	3,113	\$ 2,714	\$ 23	\$ 32
TOTAL	\$186	11 823	38,779	15 154	49,705	\$ 44,400	\$325	\$ 630

* This table is duplicated in Attachment I (Table I-6.3-1)

3.2 WELL ASSESSMENT STUDY (Attachment II)

3.2.1 Summary

This study assesses 838 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*. There are 14 different types of well construction in the SST farms (described in Appendix A in Attachment II).

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 fit-for-use.

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 non-compliant 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 fit for use.

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 to not 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 838 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 fitness for use. 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. Twelve wells have been decommissioned per WAC 173-160 and require no further action.

Priority 1 (55 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 in contact with groundwater or are in detrimental locations.

Priority 2 (62 wells) are vadose zone wells that also present a high risk to the groundwater, however their relative location to the tanks limits their use for monitoring during SST waste retrieval activities. These wells are identified as second priority for decommissioning.

Priority 3 (709 wells), are vadose zone wells located around the SST that also present a risk to the groundwater. However, because of their relative location 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 3.2-1 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 3.2-2, 3.2-3, and 3.2-4, respectively. Table 3.2-5 provides a cost summary of unit prices to decommission or repair 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 a long term variance for the Priority 3 wells. The variance would be negotiated with WDOE as to the specific actions already taken and future actions to be taken 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 for the basis for this recommendation). 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 perceived safety hazard due to a 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, thereby, eliminating the potential for erroneous explosions.

The wells were evaluated for use in vadose zone testing, i.e., soil sampling or for cross-borehole partitioning inter-well tracer tests (PITT). This provided 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 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 Attachment II, Appendix C.

Table 3.2-1*

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 \$6.4M**	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: \$2.3M**	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: \$1.5M**	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: \$3.4M**	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	
		Variance still required	
3. Watertight Manhole Estimated cost: \$1.7M (Priority 3 wells only)	Easy to locate each well		
	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 II-6.2-1).

**Priority 1 wells only.

Table 3.2-2*

**ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 1 WELLS FOR DECOMMISSIONING**

TANK FARM	NO. OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	LF OF WELLS DOUBLE CASING	Alt. 2a COST TO REMOVE WELL CASING	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH.	Alt. 2c COST TO PERF CASING W/ JET SHOT	Alt. 2d COST TO REMOVE INNER CASING & MECHANICAL PERFORATE
A	4	1,351	1,148	\$994,000	\$361,000	\$218,000	\$852,000
AX	13	1,663	0	\$1,223,000	\$448,000	\$300,000	\$448,000
B	0	0	0	\$0	\$0	\$0	\$0
BX	2	28	0	\$21,000	\$7,000	\$5,000	\$7,000
BY	1	275	234	\$202,000	\$74,000	\$46,000	\$174,000
C	0	0	0	\$0	\$0	\$0	\$0
S	3	627	350	\$461,000	\$168,000	\$101,000	\$318,000
SX	6	1,213	510	\$892,000	\$325,000	\$206,000	\$543,000
T	24	3,100	0	\$2,280,000	\$760,000	\$509,000	\$760,000
TX	0	0	0	\$0	\$0	\$0	\$0
TY	2	461	417	\$339,000	\$125,000	\$79,000	\$302,000
U	0	0	0	\$0	\$0	\$0	\$0
TOTAL	55	8,718	2,659	\$6,412,000	\$2,268,000	\$1,464,000	\$3,404,000

NOTES:

- 1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE 3.2-5.
- 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.

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

Table 3.2-3*

**ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 2 WELLS FOR DECOMMISSIONING**

TANK FARM	NUMBER OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	LF OF WELLS DOUBLE CASING	Alt. 2a COST TO REMOVE WELL CASING	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH.	Alt. 2c COST TO PERF CASING W/ JET SHOT	Alt. 2d COST TO REM INNER CASING & MECHANICAL PERFORATE
A	2	301	0	\$221,000	\$80,000	\$49,000	\$80,000
AX	7	92	0	\$68,000	\$25,000	\$17,000	\$25,000
B	8	915	300	\$673,000	\$235,000	\$152,000	\$366,000
BX	17	2,135	0	\$1,571,000	\$568,000	\$359,000	\$568,000
BY	0	0	0	\$0	\$0	\$0	\$0
C	7	684	150	\$503,000	\$183,000	\$117,000	\$247,000
S	2	300	0	\$221,000	\$81,000	\$48,000	\$81,000
SX	4	355	0	\$261,000	\$95,000	\$60,000	\$95,000
T	5	723	601	\$532,000	\$177,000	\$119,000	\$447,000
TX	6	900	0	\$662,000	\$241,000	\$158,000	\$241,000
TY	0	0	0	\$0	\$0	\$0	\$0
U	4	600	200	\$441,000	\$158,000	\$96,000	\$244,000
TOTAL	62	7,005	1,251	\$5,153,000	\$1,843,000	\$1,175,000	\$2,394,000

NOTES:

- 1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE 3.2-5.
 - 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.
- * This table is duplicated in Attachment II (Table II-E-2).

Table 3.2-4*

**ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 3 WELLS FOR DECOMMISSIONING**

TANK FARM	NO. OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	LF OF WELLS DOUBLE CASING	Alt. 2a COST TO REMOVE WELL CASING	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH.	Alt. 2c COST TO PERF CASING W/ JET SHOT	Alt. 2d COST TO REM INNER CASING & MECHANICAL PERFORATE	Alt. 3 COST TO INSTALL WATERTIGHT MANHOLE
A	47	5,221	200	\$3,841,000	\$1,394,000	\$844,000	\$1,479,000	\$113,000
AX	32	3,182	0	\$2,341,000	\$857,000	\$575,000	\$857,000	\$86,000
B	40	4,337	50	\$3,190,000	\$1,115,000	\$722,000	\$1,137,000	\$97,000
BX	62	6,609	265	\$4,862,000	\$1,759,000	\$1,111,000	\$1,873,000	\$150,000
BY	70	7,376	50	\$5,426,000	\$1,982,000	\$1,236,000	\$2,003,000	\$167,000
C	63	6,645	200	\$4,888,000	\$1,778,000	\$1,132,000	\$1,863,000	\$151,000
S	68	7,544	0	\$5,550,000	\$2,026,000	\$1,214,000	\$2,026,000	\$164,000
SX	94	9,490	90	\$6,981,000	\$2,546,000	\$1,608,000	\$2,584,000	\$226,000
T	66	6,787	5,891	\$4,993,000	\$1,664,000	\$1,114,000	\$4,313,000	\$157,000
TX	91	9,241	50	\$6,798,000	\$2,473,000	\$1,619,000	\$2,494,000	\$227,000
TY	21	2,778	0	\$2,044,000	\$751,000	\$477,000	\$751,000	\$72,000
U	55	6,447	50	\$4,743,000	\$1,695,000	\$1,032,000	\$1,716,000	\$135,000
TOTAL	709	75,657	6,846	\$55,657,000	\$20,040,000	\$12,684,000	\$23,096,000	\$1,745,000

NOTES:

1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE 3.2-5.

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.

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

Table 3.2-5*

**ORDER OF MAGNITUDE - COST SUMMARY
WELL DECOMMISSIONING OR REPAIR
UNIT PRICES**

TANK FARM	NUMBER OF WELLS	LINEAR FT. OF WELLS	Alt. 2a REMOVE WELL CASING & 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	\$735.62	\$266.94	\$161.63	\$694.78	\$2,414
AX	52	4,936	\$735.62	\$269.35	\$180.62	\$694.78	\$2,692
B	48	5,252	\$735.62	\$257.18	\$166.54	\$694.78	\$2,424
BX	81	8,772	\$735.62	\$266.15	\$168.16	\$694.78	\$2,380
BY	71	7,651	\$735.62	\$268.67	\$167.57	\$694.78	\$2,390
C	70	7,329	\$735.62	\$267.56	\$170.33	\$694.78	\$2,391
S	73	8,471	\$735.62	\$268.54	\$160.86	\$694.78	\$2,407
SX	104	11,058	\$735.62	\$268.29	\$169.47	\$694.78	\$2,380
T	95	10,610	\$735.62	\$245.14	\$164.09	\$694.78	\$2,372
TX	97	10,141	\$735.62	\$267.56	\$175.16	\$694.78	\$2,368
TY	23	3,239	\$735.62	\$270.30	\$171.62	\$694.78	\$2,482
U	59	7,047	\$735.62	\$262.88	\$160.00	\$694.78	\$2,403
TOTAL	826	91,379	\$735.62	\$264.28	\$167.65	\$694.78	\$2,411

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

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 farm is almost flat, less than 1% slope. The soils are very porous, i.e., sand and gravel. There is no vegetation on the surface of the farms and in TX, TY, and BX Tank Farms, a loose gravel surface was installed as part of the controlled, clean, and stable program.

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

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. In addition, several of the tank farms have highly contaminated spills that have been covered over within the farm boundaries.

The surface conditions varied from tank farm to tank farm. Tank Farms A, AX, BY, C, S, SX, TX and U are congested with numerous risers, valve pits, and pump pits. The surfaces of Tank Farms B and TY are nearly free of aboveground obstructions. Tank Farms BX and T have several risers or pits with one or two risers per tank. These obstructions require additional hand labor for installation of a surface or subsurface type barrier.

3.3.2 Conclusions

Based on SST farm surface conditions, it is evident that major surface grading would be required before surface water run-off could be achieved. This is unacceptable considering the high-permeability of the soil in the tank farms. The slopes would have to be a minimum of 30% or greater 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. In order to prevent water from running

onto the farm from outside the fence a barrier could be erected outside the fence line. This barrier is discussed in Attachment III.

Within the farms, three general 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 3.3-1 provides a comparison of advantages and disadvantages of the alternatives, by number. Surface water control costs are shown in Table 3.3-2. 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, a surface barrier should be constructed outside the farm boundaries to stop surface water from running onto the farm (Alternative 6 in Attachment III, Section 5.2.6.). The tank farms should be prioritized for the construction sequence of barrier 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. 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 may be required.

Table 3.3-1*

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: \$1M	Simplest	Cannot achieve sufficient slope to control flow
	Partially controls surface water flow	Porous soil in farm
3. Geo-fabric Liner Estimated cost: \$55.8M	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.
	Proven technology	Costs assume 50% removal.
4. Asphalt Concrete Paving Estimated cost: \$22.7M	Semi-impervious surface barrier is proven technology	Heat retention in summer.
		All paving placed 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% removal.
5. Building Enclosure with Asphalt Apron Estimated cost: \$231M	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: \$300K	Eliminate run-on to SST farms	Objectives of engineering study not fully achieved
	Does not disturb contaminated soil, or farm activities	
	Installation may use motorized equipment	

*This table is duplicated in Attachment III (Table III-6.1-1)

Table 3.3-2*

SURFACE WATER CONTROL COST INFORMATION SUMMARY

TANK FARM	Alt 2 SITE GRADING	Alt. 3 GEO-FABRIC LINER	Alt. 4 ASPHALT CONCRETE PAVING	Alt. 5 BUILDING ENCLOSURE WITH ASPHALT APRON	Alt. 6 RUN-ON CONTROL
A	\$57,300	\$3,990,000	\$1,530,000	\$11,870,000	\$18,700
AX	\$41,500	\$2,890,000	\$1,110,000	\$7,500,000	\$3,900
B	\$91,200	\$4,260,000	\$1,780,000	\$21,200,000	\$42,300
BX	\$94,100	\$4,450,000	\$1,860,000	\$20,210,000	\$36,300
BY	\$94,100	\$6,530,000	\$2,510,000	\$20,300,000	\$0
C	\$79,600	\$3,760,000	\$1,580,000	\$19,800,000	\$41,300
S	\$94,100	\$4,410,000	\$1,840,000	\$20,210,000	\$33,400
SX	\$106,800	\$5,070,000	\$2,120,000	\$23,030,000	\$30,100
T	\$96,100	\$4,500,000	\$1,880,000	\$20,720,000	\$20,600
TX	\$140,800	\$6,600,000	\$2,760,000	\$31,260,000	\$30,000
TY	\$58,300	\$2,730,000	\$1,140,000	\$11,920,000	\$5,700
U	\$96,100	\$6,640,000	\$2,560,000	\$23,400,000	\$37,700
TOTAL	**\$1,050,000	\$55,830,000	\$22,670,000	\$231,420,000	\$300,000

* This table is duplicated in Attachment III (Table III-6.4-1)

**Only portions of most tank farms require grading.

3.4 OVERALL STUDY RECOMMENDATIONS

The recommended implementation plan applies a graded approach to the interim measure resolutions. This approach consists of addressing the highest-risk moisture contributors.

Priorities are based on risk and cost effectiveness.

- Interim Measure Priority 1. Request a variance for all wells because it facilitates compliance with state regulations.
- Interim Measure Priority 2. Waterline exploration, locate and identify active water lines and establish a priority for fitness for use testing or abandoning in place to verify status of active/inactive water lines.
- Interim Measure Priority 3. Complete actions to abandon in place all water lines within the SST farms to eliminate existing and potential leaking water lines.
- Interim Measure Priority 4. Provide run-on control barrier at all SST farms to eliminate run-on from outside sources.
- Interim Measure Priority 5. Abandon, repair, or replace water lines outside the farm to reduce potential for large volume water line breaks or leaks.
- Interim Measure Priority 6. Decommission all Priority 1 wells to eliminate current paths to groundwater.
- Interim Measure Priority 7. Decommission all Priority 2 wells to eliminate unneeded wells within the farms.
- Interim Measure Priority 8. Decommission all Priority 3 wells, following SST farm retrieval activities as part of RCRA corrective measures study (CMS).
- Interim Measure 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 WDOE on the specific requirements of the variance. A short-term variance will be requested for the Priority 1 and 2 wells, and a long-term variance requested for the 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 provide a large volume of liquid to transport contamination through the vadose zone, whether through the soil or via a well casing. Eliminating 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, \$300,000, for limiting the risk of liquid run-on from surrounding areas. Run-on control addresses water line breaks and weather hazards, such as cloudbursts, snow melt, and frozen soil with heavy rain or snow melt.

Table 3.4-1 provides a qualitative rank of the level of contamination on the SST farms from greatest to least. This table is based on information in the monthly Hanlon Report. The farms are ranked using a combination of the number of leaking tanks and the volume of waste leaked from those tanks.

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 3.4-1

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

There are numerous ways these recommendations could be implemented:

- 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

Rough order of magnitude (ROM) cost estimates are provided for the preferred alternative from each of the three studies. Included in these costs are LMHC overview operational costs for support of construction, 30%; FDH support cost, 23% on project cost and 19.1% on LMHC 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 escalation or operation and maintenance costs. Detailed costs for all the alternatives have been prepared for each study (see Attachments I, II, and III).

An activity schedule has been prepared for each alternative, expressed in crew shifts, or 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.

On October 1, 1999, LMHC became a prime contractor to DOE. This change in contract has had no affect on the basis of the estimates contained in this report.

Table 4.1

DURATION AND COSTS FOR PREFERRED ALTERNATIVES

PREFERRED ALTERNATIVE	COSTS	SCHEDULE
WATERLINE ASSESSMENT STUDY		
Waterline Exploration (lines with poor documentation)	\$186,000	1 week/ tank farm
Alternative 3: Water lines abandoned in place	\$ 325,000	1-2 weeks/ tank farm
WELL ASSESSMENT STUDY		
Alternative 2c: Jet Shot Perforation		
Priority 1 Decommission	\$1,464,000	20 – 25 weeks
Priority 2 Decommission	\$1,175,000	25 – 30 weeks
Priority 3 Decommission	\$12,684,000	20 – 25 weeks/tank farm
Alternative 3: Extend Well Casing	\$1,745,000	5 – 10 weeks
SURFACE WATER ASSESSMENT STUDY		
Alternative 6:Run-On Control	\$300,000	2 – 3 weeks/tank farm
Alternative 5:Building Enclosure	\$185,210,000	2 – 3 months/tank farm

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ENGINEERING STUDY

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

October 1999

Subcontract LMHC 96WO-0006

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- Appendix A. DECISION MATRIX
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- Appendix C. DRAWINGS

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. 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. These include lines labeled as sanitary or potable water, raw and well water lines, and fire water. There are approximately 27 km (17 miles) of ½-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).

The object of this engineering study report is to identify and evaluate alternatives for pressurized water line control 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 to 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

Research efforts examining record drawing files determined 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 eliminated when all the water lines are isolated within the farm areas.

Field verified as-built documentation should be provided, and accurate essential drawings for the water systems in and around the farm area would 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. The continued use of water for interim stabilization and retrieval operations should be provided by water tank trucks, skid-mounted water tanks with limited tank capacity, or aboveground pipelines.

The cost for the water line assessment preferred alternative (verify status, cut, cap, and abandon in place active and inactive lines) is approximately \$511,000.

3.0 APPROACH/EVALUATION

The best possible solutions have been investigated to control the 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 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. LMHC 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 at a distance of 150 meters (500 feet) or more away, 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. 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. 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 main lines supplying water to the individual tank farms. 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. Larger diameter service main lines were fairly well documented. Ambiguous information was primarily associated with the smaller lines within the farm area. 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 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 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.

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 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 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 of 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 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 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 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 ASSUMPTION, 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.

- 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 limited.
- 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.

- DOE Order 5420.2A *Radioactive Waste Management*
- DOE Order 5480.28 *Natural Phenomena Hazards Mitigation*
- HNF-PRO-097 *Engineering Design and Evaluation*
- HNF-SD-WM-BIO-001 *Basis for Interim Operations*
- WAC 173-303-640 *Dangerous Waste Regulations, Tank Systems*
- WHC-CM-4-46 *Safety Classification of Structures, Systems, and Components*
- WHC-IP-1043 *WHC Occupational ALARA Program*
- WHC-SD-GN-DGS-30011 *Radiological Design Guide*

5.1.3 Requirements

The SSTs are currently operating under interim status, pending closure. The requirements herein 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. These 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, i.e., 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 are suspect and cause of serious concern. Most of these water lines were instilled during original tank farm construction, 30 to 55 years ago. Pipeline deterioration over time due to corrosion, pipeline settlement, system operation, i.e., water hammer, etc., has weakened the system. Underground leaks are more frequently reported in lead joints, or pipeline wall failures, increasing the number of calls for repairs. 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.

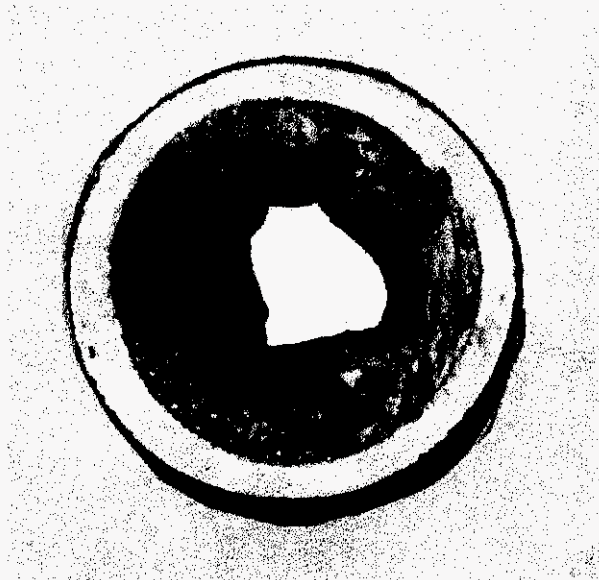


Photo 1
TUBERCULATION BUILDUP INSIDE POTABLE WATER LINE

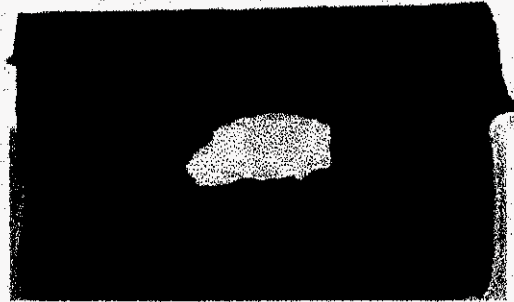


Photo 2

**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 ½-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 inactive water lines ranging from ½-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) and under the TPA milestone, it is scheduled to start pumping in FY2000 with completion by FY2003 (see Section 9.0). Therefore, a 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 9.0), 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 and under the TPA milestone, it is scheduled to start pumping in FY2000 with completion 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 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). There are no current water demands at B Tank Farm, with exception of TPA SST retrieval operations.

5.2.4 241-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 PW/RW lines are within the farm area.

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

5.2.5 241-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. From the 12-in. RW main, running along the north/northwest boundary, a 2-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 2 500 m (8,200 ft) of water pipes ranging in size from 1/2-to 12-in. diameter are within the farm area.

Of the 16 tanks, only tanks C-103 and C-106 have not been IS. Under the TPA milestone, Tank C-103 is scheduled to start pumping in FY2002 with completion by FY2003. Tank C-106 is scheduled to be pumped and closed via project W-320 and the Hanford Tanks Initiative (HTI) project. 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.

5.2.7 241-S Tank Farm

The 12 storage tanks are supplied RW through an active 6-in. pipeline along the east side of S Tank Farm. Along the north boundary of the farm area are active 24-in. and 14-in. RW lines. 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 active and inactive water lines, ranging from 3/4- to 24-in. diameter, are in the farm area (see ES-050051-C2, sh 9 and 10).

Eight of the 12 tanks, have not been IS and under the TPA milestone, they are scheduled to start pumping in FY1999 with 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

The 15 storage tanks in SX Farm are supplied RW through an active 6-in. pipeline from the north and west sides of the tank farm. Approximately 1 600 m (5,200 ft) of active and 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 and under the TPA milestone, they are scheduled to start pumping in FY1999 with completion by FY2003 (see Section 9.0). 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).

Two of the 16 tanks have not been IS, and under the TPA milestone, they are scheduled to be completed in FY1999. RW supply 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.

5.2.10 241-TX Tank Farm

There are two active water lines serving the 18 storage tanks: a 4-in. RW line and a 6-in. chilled water line (see ES-050051-C2, sh 12 and 14). Approximately 3 800 m (12,300 ft) of predominately 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 six storage tanks, however there is one active 6-in. chilled water line passing along the east side within the farm area. 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 242-T Evaporator Building. (See ES-050051-C2, sh 12 and 15.)

The six 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 inactive water lines, ranging from 1-to 4-in. diameter, are within the farm area (see ES-050051-C2, sh 16 and 17).

Eight of the 16 tanks have not been IS, and under the TPA milestone, they are scheduled to start pumping in FY2000 with completion by FY2003. A 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 defective 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. In addition, documented records are incomplete or missing that describe the status of the pipelines, active or inactive, and how and where the abandoned water lines were disconnected. 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 i.e., plumbing appurtenances, fire hydrants, hose bibs, etc. 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 corp 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 may prove to be an unreasonable or unacceptable risk. For this reason, FDNW 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.

As a final step in this activity, a set of H-2-XXXXX essential drawings should be created for the water lines, documenting each line. The drawings should be updated on a regular basis and given a priority so that all future actions involving the water system can be 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. The Hanford Site water purveyor should be tasked to manage these drawings and to ensure they are kept accurate.

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, and 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 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 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-DISADVANTAGES

Table I-6.1-1 provides a comparison of advantages and disadvantages for the water line assessment.

Table I-6.1-1

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: \$186K	Provides required data for alternatives below	Required for Alternatives 2, 3, and 4
2. Remove Water Lines Estimated cost: \$44.4M	Requires review of water distribution network in SST farms	Large waste volume for disposal
	Eliminates potential source of water to vadose zone	Extensive HPT 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: \$325K	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	HPT coverage required
	Small sections of pipe exposed at any one time	
4. Grout-fill Abandoned Water Lines Estimated cost: \$630K	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 HPT 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 I-6.4-1 provides a summary of the cost information for each proposed alternative. The estimate in Appendix B considers the removal, cap and abandoned, or cap and grout filling the currently inactive lines. The estimate does not address modifying the active lines currently in use (see estimate Z696S).

Included in Table I-6.3-1 is a cost for water line exploration, a common task for each alternative. This additional cost must be added to each alternative.

Table I-6.3-1

WATERLINE ASSESSMENT ALTERNATIVE COSTS
(\$ x 1000)

TANK FARM	WATERLINE EXPLORATION	ACTIVE WATERLINES		INACTIVE WATERLINES		REMOVE PIPE ALT 2	ABANDON PIPE ALT 3	GROUT PIPE ALT 4
		m	ft	m	ft			
A	\$ 25	2 289	7,508	1 220	4,002	\$ 5,335	\$ 43	\$ 118
AX	\$ 13	2 998	9,833	216	708	\$ 4,802	\$ 22	\$ 40
B	\$ 13	1 671	5,481	1 313	4,307	\$ 5,776	\$ 22	\$ 36
BX	\$ 13	704	2,309	1 229	4,031	\$ 2,965	\$ 22	\$ 38
BY	\$ 13	0	0	1 955	6,412	\$ 3,331	\$ 22	\$ 36
C	\$ 13	1 304	4,277	1 186	3,890	\$ 3,418	\$ 22	\$ 36
S	\$ 13	1 430	4,690	827	2,713	\$ 2,714	\$ 22	\$ 76
SX	\$ 26	501	1,643	1 084	3,556	\$ 2,641	\$ 46	\$ 87
T	\$ 13	0	0	1 162	3,811	\$ 2,037	\$ 22	\$ 33
TX	\$ 26	478	1,568	3 273	10,735	\$ 7,276	\$ 46	\$ 80
TY	\$ 5	0	0	740	2,427	\$ 1,435	\$ 13	\$ 18
U	\$ 13	448	1,469	949	3,113	\$ 2,714	\$ 23	\$ 32
TOTAL	\$186	11 823	38,779	15 154	49,705	\$ 44,400	\$325	\$ 630

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 construction 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.

There have been varying degrees of confidence in the existing documentation on the condition of existing pipelines, such as, whether or not they have been capped, are they isolated properly, location of pipe modifications, etc. 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 with the reliability of ECN and work package documentation provided.

There will be residual water present in the abandoned lines when they are exposed. The concern is for radiation contamination caused by the residual water leaking into the soil and this will be dealt with on a case-by-case basis.

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 CHANGES TO IMPLEMENT PREFERRED ALTERNATIVE

Discussions about future tank farm operations include consideration of the extension of new or reusing some existing water lines to serve the water needs for a few tank farms, i.e., U, A, AX, etc. Reusing 30 to 55 year old water lines and justifying their reuse by qualifying the lines through pneumatic or hydrostatic testing is contrary to TPA objectives. FDNW 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 water needs for the tank farms should be limited to aboveground lines or water tank trucks that can be monitored continuously and removed following the activity.

Project W519 has proposed installing approximately 725 m (2,400 ft) of new 6-in. pipe, providing infrastructure services to the privatization site. This line will be 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 will be specified which permit minimal joint leakage during the hydrostatic testing of the line and the discharge and disposal of flush water following the installation of the newly placed line. The vadose zone program needs to be aware of this and develop construction policies, to mitigate discharges into the farm areas from

construction activity of this nature. Similarly, 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 - SST Farm Engineering	Jeff Doeler, Lee Dougherty, Kevin Hull
- Interim Stabilization	Jim Crawford, Mike Koch, Dave Saueressig, Steve Swaney, Dave Vladimiroff
- TWRS, Tank Farm Engineering	Dave Parkman, Gary Tardiff
- Saltwell Pumping Operations	Rebecca Raven

9.2 SKETCHES

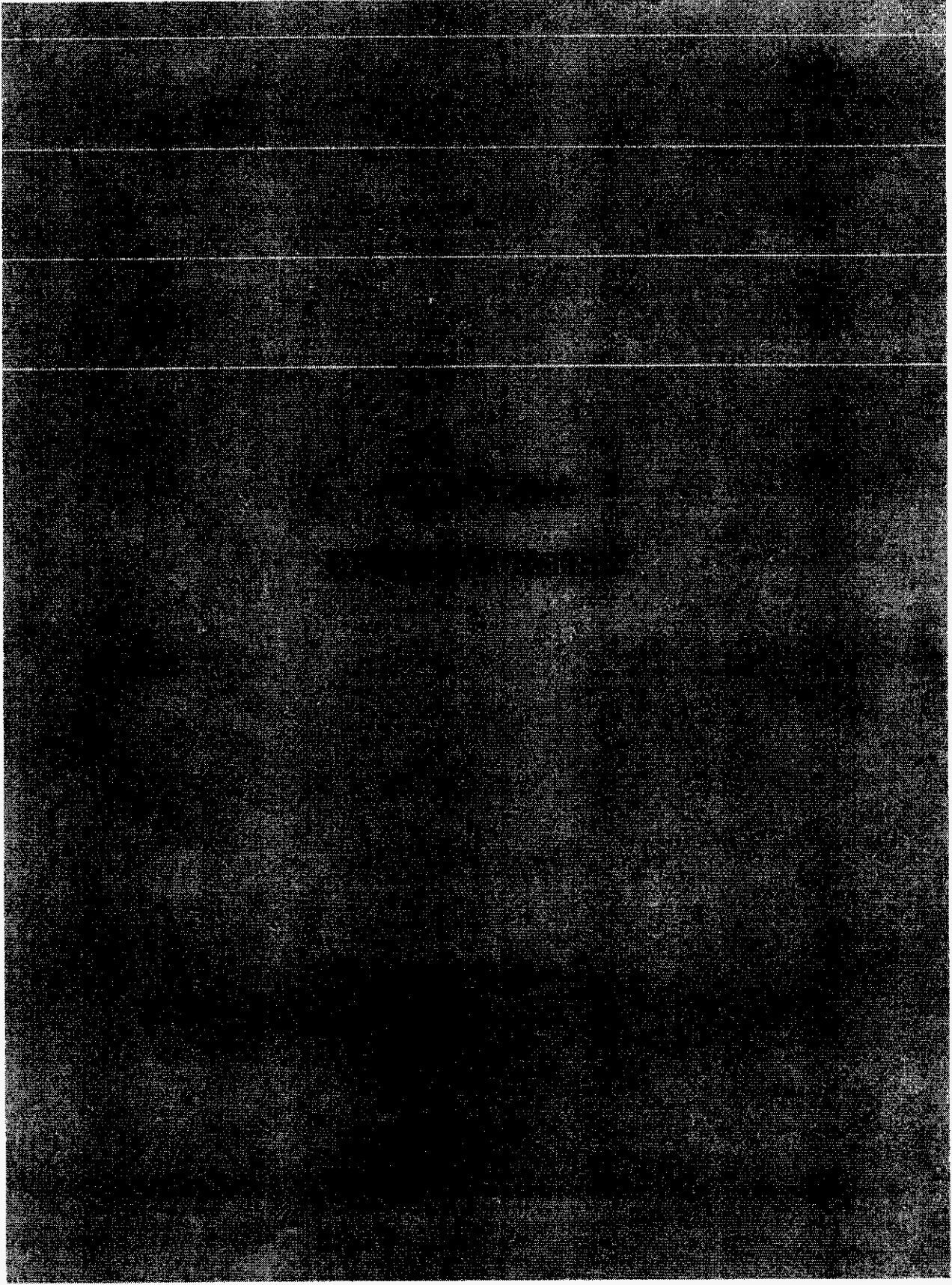
See the reference block on the engineering sketches.

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** Washington State Department of Ecology, *Hazardous Waste Management Act, (HWMA, Chapter 70.105 RCW)*
- 9.3.6** Washington State Department of Ecology *Dangerous Waste Regulations, (Chapter 173-303 WAC)*, Publication 92-91, amended February 1998.



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
	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
	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)	SCORE/WEIGHTED SCORE				
		NON-RADIATION RELEASES (4.1.1.2)					
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	2/10	3/15
	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)	SCORE/WEIGHTED SCORE				
		NON-RADIATION RELEASES (4.1.1.2)					
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	2/10	3/15
	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				
	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)	SCORE/WEIGHTED SCORE				
		NON-RADIATION RELEASES (4.1.1.2)					
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	2/10	3/15
	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)	SCORE/WEIGHTED SCORE				
		NON-RADIATION RELEASES (4.1.1.2)					
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	2/10	3/15
	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
	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
	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)					
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-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)	SCORE/WEIGHTED SCORE				
		NON-RADIATION RELEASES (4.1.1.2)					
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	2/10	3/15
	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

WATERLINE REMOVAL B-

WATERLINE CAPPING B-

WATERLINE GROUT & CAP B-

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
ORDER OF MAGNITUDE
 PRMCR01 - PROJECT COST SUMMARY

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 DATE 08/17/99 11:53:29
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST		CONTINGENCY TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	22,220,000	30	6,670,000	28,890,000
LMHC	LOCKHEED MARTIN HAMPFORD CORP.	6,300,000	30	1,890,000	8,190,000
SUBTOTAL		28,520,000	30	8,560,000	37,080,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	5,630,000	30	1,690,000	7,320,000
PROJECT TOTAL		34,150,000	30	10,250,000	44,400,000

I-B-1

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/17/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>DRY</i>	ESTIMATING MANAGER	<i>Edley</i>
PROJECT MANAGER			
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	630118	0.00	0	30	189035	190453	1009606
	SUBTOTAL 11 DEFINITIVE DESIGN	630118	0.00	0	30	189035	190453	1009606
121100	ENGINEERING DURING CONSTRUCTION	630118	0.00	0	30	189035	190453	1009606
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	630118	0.00	0	30	189035	190453	1009606
320011	A-FARM EXPOSE PIPE, CUT AND CAP	16031	0.00	0	30	4809	4108	24949
320012	A-FARM REMOVE PIPES	2503653	0.00	0	30	751096	641699	3896449
	SUBTOTAL 32001 241-A FARM	2519685	0.00	0	30	755905	645808	3921399
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320022	AX-FARM REMOVE PIPES	2260235	0.00	0	30	678070	579310	3517616
	SUBTOTAL 32002 241-AX FARM	2268547	0.00	0	30	680564	581440	3530552
320031	B-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320032	B-FARM REMOVE PIPES	2719562	0.00	0	30	815868	697038	4232469
	SUBTOTAL 32003 241-B FARM	2727875	0.00	0	30	818362	699168	4245406
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320042	BX-FARM REMOVE PIPES	1367145	0.00	0	30	410143	350406	2127694
	SUBTOTAL 32004 241-BX FARM	1375457	0.00	0	30	412637	352537	2140631
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320052	BY-FARM REMOVE PIPES	1564714	0.00	0	30	469414	401044	2435172
	SUBTOTAL 32005 241-BY FARM	1573026	0.00	0	30	471907	403175	2448109
320061	C-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936

I-B-2

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 1696
 FILE NO. 1696SAH1

**** TEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
ORDER OF MAGNITUDE
PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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 BY KLR/DLG

1-B-3

WBS	DESCRIPTION	ESTIMATE	ESCALATION		SUB	CONTINGENCY		SUB	SITE	TOTAL
		SUBTOTAL	%	TOTAL	TOTAL	%	TOTAL	TOTAL	ALLOCAT'N	DOLLARS
320062	C-FARM REMOVE PIPES	1605006	0.00	0	1605006	30	481501	2086507	411371	2497879
	SUBTOTAL 32006 241-C FARM	1613318	0.00	0	1613318	30	483995	2097314	413502	2510816
320071	S-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806	2130	12936
320072	S-FARM REMOVE PIPES	1274056	0.00	0	1274056	30	382217	1656273	326547	1982821
	SUBTOTAL 32007 241-S FARM	1282369	0.00	0	1282369	30	384710	1667080	328678	1995758
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	16625	0.00	0	16625	30	4987	21612	4261	25873
320082	SX-FARM REMOVE PIPES	1230430	0.00	0	1230430	30	369129	1599559	315365	1914925
	SUBTOTAL 32008 241-SX FARM	1247055	0.00	0	1247055	30	374116	1621172	319626	1940799
320091	T-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806	2130	12936
320092	T-FARM REMOVE PIPES	953111	0.00	0	953111	30	285933	1239044	244287	1483332
	SUBTOTAL 32009 241-T FARM	961423	0.00	0	961423	30	288427	1249850	246417	1496268
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	16625	0.00	0	16625	30	4987	21612	4261	25873
320102	TX-FARM REMOVE PIPES	3417862	0.00	0	3417862	30	1025358	4443221	876016	5319237
	SUBTOTAL 32010 241-TX FARM	3434487	0.00	0	3434487	30	1030346	4464833	880277	5345110
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	3325	0.00	0	3325	30	997	4322	852	5174
320112	TY-FARM REMOVE PIPES	674402	0.00	0	674402	30	202320	876723	172852	1049576
	SUBTOTAL 32011 241-TY FARM	677727	0.00	0	677727	30	203318	881045	173705	1054751
320121	U-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806	2130	12936
320122	U-FARM REMOVE PIPES	1273223	0.00	0	1273223	30	381966	1655190	326333	1981524
	SUBTOTAL 32012 241-U FARM	1281535	0.00	0	1281535	30	384460	1665996	328464	1994460
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	20962510	0.00	0	20962510	30	6288753	27251263	5372801	32624064

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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WBS DESCRIPTION	ESTIMATE	ESCALATION		SUB	CONTINGENCY		SUB	SITE	TOTAL
	SUBTOTAL	\$	TOTAL	TOTAL	\$	TOTAL	TOTAL	ALLOCAT'N	DOLLARS
500000 OPERATING CONTRACTOR (LMRC)	6300000	0.00	0	6300000	30	1890000	8190000	1564290	9754290
PROJECT TOTAL	28,522,746	0.00	0	28,522,746	30	8,556,823	37,079,569	7,317,998	44,397,567

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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 PDNM 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LMHC PROJECT MANAGEMENT.
 D. THIS ESTIMATE ALSO UTILIZES A STANDARD PDNM 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 HOUR 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 DYNACORP HAVE BEEN PROVIDED BY PDNM PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
 (1) CONTRACT ADMINISTRATION FACTOR OF 18.75% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT
 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 PDNM RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AS CM RATES.

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

F. DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
 (1) PDH GFS/G&A CONST, MGMT, GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.00%
 (2) PDH GFS/G&A CONST, GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE SUBCONTRACTS.
 (3) PDH SUBCONTRACT - G&A/PER RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
 (4) PDH GFS/G&A - LABOR, GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.00%
 (5) PDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION
 NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

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 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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
FDWN	FLUOR DANIEL NORTHWEST							
111100	DEFINITIVE DESIGN	630118	0.00	0	630118	30	189035	819153
	SUBTOTAL 11	630118	0.00	0	630118	30	189035	819153
121100	ENGINEERING DURING CONSTRUCTION	630118	0.00	0	630118	30	189035	819153
	SUBTOTAL 12	630118	0.00	0	630118	30	189035	819153
320011	A-FARM EXPOSE PIPE, CUT AND CAP	16031	0.00	0	16031	30	4809	20840
320012	A-FARM REMOVE PIPES	2503653	0.00	0	2503653	30	751096	3254749
	SUBTOTAL 32001 241-A FARM	2519685	0.00	0	2519685	30	755905	3275590
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806
320022	AX-FARM REMOVE PIPES	2260235	0.00	0	2260235	30	678070	2938305
	SUBTOTAL 32002 241-AX FARM	2268547	0.00	0	2268547	30	680564	2949112
320031	B-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806
320032	B-FARM REMOVE PIPES	2719562	0.00	0	2719562	30	815868	3535431
	SUBTOTAL 32003 241-B FARM	2727875	0.00	0	2727875	30	818362	3546237
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806
320042	BX-FARM REMOVE PIPES	1367145	0.00	0	1367145	30	410143	1777288
	SUBTOTAL 32004 241-BX FARM	1375457	0.00	0	1375457	30	412637	1788094
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806
320052	BY-FARM REMOVE PIPES	1564714	0.00	0	1564714	30	469414	2034128
	SUBTOTAL 32005 241-BY FARM	1573026	0.00	0	1573026	30	471907	2044934
320061	C-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	8312	30	2493	10806

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 1696
 FILE NO. 1696SAH1

**** TEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
320062	C-FARM REMOVE PIPES	1605006	0.00	0	30	481501	411371	2497879
SUBTOTAL 32006 241-C FARM		1613318	0.00	0	30	483995	413502	2510616
320071	S-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320072	S-FARM REMOVE PIPES	1274056	0.00	0	30	382217	326547	1982821
SUBTOTAL 32007 241-S FARM		1282369	0.00	0	30	384710	328678	1995758
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	16625	0.00	0	30	4987	4261	25873
320082	SX-FARM REMOVE PIPES	1230430	0.00	0	30	369129	315365	1914925
SUBTOTAL 32008 241-SX FARM		1247055	0.00	0	30	374116	319626	1940799
320091	T-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320092	T-FARM REMOVE PIPES	953111	0.00	0	30	285933	244287	1483332
SUBTOTAL 32009 241-T FARM		961423	0.00	0	30	288427	246417	1496268
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	16625	0.00	0	30	4987	4261	25873
320102	TX-FARM REMOVE PIPES	3417862	0.00	0	30	1025358	876016	5319237
SUBTOTAL 32010 241-TX FARM		3434487	0.00	0	30	1030346	880277	5345110
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	3325	0.00	0	30	997	852	5174
320112	TY-FARM REMOVE PIPES	674402	0.00	0	30	202320	172852	1049576
SUBTOTAL 32011 241-TY FARM		677727	0.00	0	30	203318	173705	1054751
320121	U-FARM EXPOSE PIPE, CUT AND CAP	8312	0.00	0	30	2493	2130	12936
320122	U-FARM REMOVE PIPES	1273223	0.00	0	30	381966	326333	1981524
SUBTOTAL 32012 241-U FARM		1281535	0.00	0	30	384460	328464	1994460
SUBTOTAL 32 FIXED PRICE CONSTRUCTIO		20962510	0.00	0	30	6288753	5372801	32624064

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		

	TOTAL PDNW FLUOR DANIEL NORTHWEST	22222746	0.00	0	22222746	30	6666823	28889569	5753708	34643277
LMHC	LOCKHEED MARTIN HANFORD CORP.									
500000	OPERATING CONTRACTOR (LMRC)	6300000	0.00	0	6300000	30	1890000	8190000	1564290	9754290
	TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	6300000	0.00	0	6300000	30	1890000	8190000	1564290	9754290

PROJECT TOTAL		28,522,746	0.00	0	28,522,746	30	8,556,823	37,079,569	7,317,998	44,397,567

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION %	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
111100	DEFINITIVE DESIGN	630118	0.00	0	0	0	630118
	SUBTOTAL 11 DEFINITIVE DESIGN	630118		0	0	0	630118
121100	ENGINEERING DURING CONSTRUCTION	630118	0.00	0	0	0	630118
	SUBTOTAL 12. ENGINEERING DURING CONSTRUC	1260236		0	0	0	1260236
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	18.75	2531	0	2531	16031
320012	A-FARM REMOVE PIPES	2108340	18.75	395313	0	395313	2503653
	SUBTOTAL 32001 241-A FARM	2121840		397845	0	397845	2519685
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320022	AX-FARM REMOVE PIPES	1903356	18.75	356879	0	356879	2260235
	SUBTOTAL 32002 241-AX FARM	4032196		756036	0	756036	4788232
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320032	B-FARM REMOVE PIPES	2290158	18.75	429404	0	429404	2719562
	SUBTOTAL 32003 241-B FARM	6329354		1186753	0	1186753	7516107
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320042	BX-FARM REMOVE PIPES	1151280	18.75	215865	0	215865	1367145
	SUBTOTAL 32004 241-BX FARM	7487634		1403931	0	1403931	8891565
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320052	BY-FARM REMOVE PIPES	1317654	18.75	247060	0	247060	1564714
	SUBTOTAL 32005 241-BY FARM	8812288		1652304	0	1652304	10464592
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IRST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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WBS	DESCRIPTION	ESTIMATE	CONSTRUCTION MANAGEMENT		OTHER	SUB	TOTAL
		SUBTOTAL	%	TOTAL	COSTS	TOTAL	TOTAL
320062	C-FARM REMOVE PIPES	1351584	18.75	253422	0	253422	1605006
	SUBTOTAL 32006 241-C FARM	10170872		1907038	0	1907038	12077910
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320072	S-FARM REMOVE PIPES	1072890	18.75	201166	0	201166	1274056
	SUBTOTAL 32007 241-S FARM	11250762		2109517	0	2109517	13360279
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	18.75	2625	0	2625	16625
320082	SX-FARM REMOVE PIPES	1036152	18.75	194278	0	194278	1230430
	SUBTOTAL 32008 241-SX FARM	12300914		2306421	0	2306421	14607335
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320092	T-FARM REMOVE PIPES	802620	18.75	150491	0	150491	953111
	SUBTOTAL 32009 241-T FARM	13110534		2458225	0	2458225	15568759
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	18.75	2625	0	2625	16625
320102	TX-FARM REMOVE PIPES	2878200	18.75	539662	0	539662	3417862
	SUBTOTAL 32010 241-TX FARM	16002734		3000512	0	3000512	19003246
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	18.75	525	0	525	3325
320112	TY-FARM REMOVE PIPES	567918	18.75	106484	0	106484	674402
	SUBTOTAL 32011 241-TY FARM	16573452		3107522	0	3107522	19680974
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	18.75	1312	0	1312	8312
320122	U-FARM REMOVE PIPES	1072188	18.75	201035	0	201035	1273223
	SUBTOTAL 32012 241-U FARM	17652640		3309870	0	3309870	20962510
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	17652640		3309870	0	3309870	20962510

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION & TOTAL	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
500000	OPERATING CONTRACTOR (LMHC)	6300000	0.00	0	0	0	6300000
PROJECT TOTAL		25,212,876		3,309,870	0	3,309,870	28,522,746

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GPS/G&A CONST.MGMT	FDH MPR F.P./S.C.	FDH GPS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	630118	1575	0	0	144927	0	146502
SUBTOTAL 11	DEFINITIVE DESIGN	630118	1575	0	0	144927	0	146502
121100	ENGINEERING DURING CONSTRUCTION	630118	1575	0	0	144927	0	146502
SUBTOTAL 12	ENGINEERING DURING CONSTRUC	630118	1575	0	0	144927	0	146502
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	0	582	2578	0	0	3160
320012	A-FARM REMOVE PIPES	2108340	0	90922	402692	0	0	493615
SUBTOTAL 32001	241-A FARM	2121840	0	91504	405271	0	0	496775
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320022	AX-FARM REMOVE PIPES	1903356	0	82082	363541	0	0	445623
SUBTOTAL 32002	241-AX FARM	1910356	0	82384	364878	0	0	447262
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320032	B-FARM REMOVE PIPES	2290158	0	98763	437420	0	0	536183
SUBTOTAL 32003	241-B FARM	2297158	0	99064	438757	0	0	537822
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320042	BX-FARM REMOVE PIPES	1151280	0	49648	219894	0	0	269543
SUBTOTAL 32004	241-BX FARM	1158280	0	49950	221231	0	0	271182
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320052	BY-FARM REMOVE PIPES	1317654	0	56823	251671	0	0	308495
SUBTOTAL 32005	241-BY FARM	1324654	0	57125	253008	0	0	310134
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYM EQ. USAGE	FDH GPS/G&A CONST. MGMT	FDH MPR F.P./S.C.	FDH GPS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
320062	C-FARM REMOVE PIPES	1351584	0	58287	258152	0	0	316439
	SUBTOTAL 32006 241-C FARM	1358584	0	58588	259489	0	0	318078
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320072	S-FARM REMOVE PIPES	1072890	0	46268	204921	0	0	251190
	SUBTOTAL 32007 241-S FARM	1079890	0	46570	206258	0	0	252829
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	0	603	2674	0	0	3277
320082	SX-FARM REMOVE PIPES	1036152	0	44684	197905	0	0	242589
	SUBTOTAL 32008 241-SX FARM	1050152	0	45287	200579	0	0	245866
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320092	T-FARM REMOVE PIPES	802620	0	34612	153300	0	0	187913
	SUBTOTAL 32009 241-T FARM	809620	0	34914	154637	0	0	189552
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	0	603	2674	0	0	3277
320102	TX-FARM REMOVE PIPES	2878200	0	124122	549736	0	0	673858
	SUBTOTAL 32010 241-TX FARM	2892200	0	124726	552410	0	0	677136
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	0	120	534	0	0	655
320112	TY-FARM REMOVE PIPES	567918	0	24491	108472	0	0	132963
	SUBTOTAL 32011 241-TY FARM	570718	0	24612	109007	0	0	133619
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	0	301	1337	0	0	1638
320122	U-FARM REMOVE PIPES	1072188	0	46238	204787	0	0	251026
	SUBTOTAL 32012 241-U FARM	1079188	0	46539	206124	0	0	252664
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	17652640	0	761270	3371654	0	0	4132924

I-B-14

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

PAGE 15 OF 18
 DATE 08/17/99 11:54:14
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	PDH GPS/G&A CONST.MGMT	PDH MPR P.P./S.C.	PDH GPS/G&A LABOR	PDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
500000	OPERATING CONTRACTOR (LMHC)	6300000	0	0	1203300	0	0	1203300
PROJECT TOTAL		25,212,876	3,150	761,270	4,574,954	289,854	0	5,629,229

LB-15

FLUOR DANIEL NORTHWEST, INC.
 LOCKNEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 16 OF 18
 DATE 08/17/99 11:53:57
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
			%	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	146502	0.00	0	146502	30	43950	190453
	SUBTOTAL 11 DEFINITIVE DESIGN	146502	0.00	0	146502	30	43950	190453
121100	ENGINEERING DURING CONSTRUCTION	146502	0.00	0	146502	30	43950	190453
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	146502	0.00	0	146502	30	43950	190453
320011	A-FARM EXPOSE PIPE, CUT AND CAP	3160	0.00	0	3160	30	948	4108
320012	A-FARM REMOVE PIPES	493615	0.00	0	493615	30	148084	641699
	SUBTOTAL 32001 241-A FARM	496775	0.00	0	496775	30	149032	645808
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00	0	1638	30	491	2130
320022	AX-FARM REMOVE PIPES	445623	0.00	0	445623	30	133686	579310
	SUBTOTAL 32002 241-AX FARM	447262	0.00	0	447262	30	134178	581440
320031	B-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00	0	1638	30	491	2130
320032	B-FARM REMOVE PIPES	536183	0.00	0	536183	30	160854	697038
	SUBTOTAL 32003 241-B FARM	537822	0.00	0	537822	30	161346	699168
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00	0	1638	30	491	2130
320042	BX-FARM REMOVE PIPES	269543	0.00	0	269543	30	80863	350406
	SUBTOTAL 32004 241-BX FARM	271182	0.00	0	271182	30	81354	352537
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00	0	1638	30	491	2130
320052	BY-FARM REMOVE PIPES	308495	0.00	0	308495	30	92548	401044
	SUBTOTAL 32005 241-BY FARM	310134	0.00	0	310134	30	93040	403175
320061	C-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00	0	1638	30	491	2130

I-B-16

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 17 OF 18
 DATE 08/17/99 11:53:57
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	TOTAL DOLLARS
320062	C-FARM REMOVE PIPES	316439	0.00 0	316439	30 94931	411371
SUBTOTAL 32006 241-C FARM		318078	0.00 0	318078	30 95423	413502
320071	S-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00 0	1638	30 491	2130
320072	S-FARM REMOVE PIPES	251190	0.00 0	251190	30 75357	326547
SUBTOTAL 32007 241-S FARM		252829	0.00 0	252829	30 75848	328678
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	3277	0.00 0	3277	30 983	4261
320082	SX-FARM REMOVE PIPES	242589	0.00 0	242589	30 72776	315365
SUBTOTAL 32008 241-SX FARM		245866	0.00 0	245866	30 73760	319626
320091	T-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00 0	1638	30 491	2130
320092	T-FARM REMOVE PIPES	187913	0.00 0	187913	30 56374	244287
SUBTOTAL 32009 241-T FARM		189552	0.00 0	189552	30 56865	246417
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	3277	0.00 0	3277	30 983	4261
320102	TX-FARM REMOVE PIPES	673858	0.00 0	673858	30 202157	876016
SUBTOTAL 32010 241-TX FARM		677136	0.00 0	677136	30 203140	880277
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	655	0.00 0	655	30 196	852
320112	TY-FARM REMOVE PIPES	132963	0.00 0	132963	30 39889	172852
SUBTOTAL 32011 241-TY FARM		133619	0.00 0	133619	30 40085	173705
320121	U-FARM EXPOSE PIPE, CUT AND CAP	1638	0.00 0	1638	30 491	2130
320122	U-FARM REMOVE PIPES	251026	0.00 0	251026	30 75307	326333
SUBTOTAL 32012 241-U FARM		252664	0.00 0	252664	30 75799	328464
SUBTOTAL 32 FIXED PRICE CONSTRUCTION		4132924	0.00 0	4132924	30 1239877	5372801

I-B-17

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAH1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE REMOVAL)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 18 OF 18
 DATE 08/17/99 11:53:57
 BY KLR/DLG

WBS DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
		%	TOTAL		%	TOTAL	
500000 OPERATING CONTRACTOR (LMRC)	1203300	0.00	0	1203300	30	360990	1564290
PROJECT TOTAL	5,629,229	0.00	0	5,629,229	30	1,688,768	7,317,998

I-B-18

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAF1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
 ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 8
 DATE 08/05/99 13:11:09
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY		TOTAL DOLLARS
			†	TOTAL	
FDNW	FLUOR DANIEL NORTHWEST	177,000	30	53,000	230,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	30,000	30	9,000	39,000

	SUBTOTAL	207,000	30	62,000	269,000
SITE	SITE ALLOCATIONS	43,000	30	13,000	56,000
	(ADJUSTED TO MEET DOE \$100.4)				

	PROJECT TOTAL	250,000	30	75,000	325,000

J-B-19

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/6/99	REMARKS:
FDNW LEAD ESTIMATOR	ESTIMATING MANAGER		
PROJECT MANAGER			
CLIENT			

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

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAF1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
 ORDER OF MAGNITUDE
 PHMCRO2 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 2 OF 8
 DATE 06/05/99 13:11:19
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS	
111100	DEFINITIVE DESIGN	28735	0.00	0	30	8620	37355	8685	46040
	SUBTOTAL 11 DEFINITIVE DESIGN	28735	0.00	0	30	8620	37355	8685	46040
121100	ENGINEERING DURING CONSTRUCTION	12315	0.00	0	30	3694	16009	3722	19731
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	12315	0.00	0	30	3694	16009	3722	19731
320001	A-FARM EXPOSE PIPE, CUT AND CAP	18252	0.00	0	30	5475	23727	4772	28500
320002	AX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320003	B-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320006	C-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320007	S-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	30	5678	24606	4949	29556
320009	T-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	30	5678	24606	4949	29556
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	3785	0.00	0	30	1135	4921	989	5911
320012	U-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	12303	2474	14778
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	135605	0.00	0	30	40681	176287	35460	211748
500000	OPERATING CONTRACTOR (LMHC)	30000	0.00	0	30	9000	39000	7449	46449
PROJECT TOTAL		206,655	0.00	0	30	61,996	268,652	55,317	323,969

I-B-20

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 PDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
- D. THIS ESTIMATE ALSO UTILIZES A STANDARD PDNW 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 DYNACORP HAVE BEEN PROVIDED BY PDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 35.2% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT

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 PDNW 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGMT: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.00%
- (3) FDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
- (4) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.00%
- (5) FDH G&A OF 19.1% APPLIED TO LHMC PROJECT COSTS.

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

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 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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

1-B-22

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAF1

** TEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

PAGE 5 OF 8
 DATE 08/05/99 13:11:25
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
FDNW	FLUOR DANIEL NORTHWEST									
111100	DEFINITIVE DESIGN	28735	0.00	0	28735	30	8620	37355	8685	46040
	SUBTOTAL 11 DEFINITIVE DESIGN	28735	0.00	0	28735	30	8620	37355	8685	46040
121100	ENGINEERING DURING CONSTRUCTION	12315	0.00	0	12315	30	3694	16009	3722	19731
	SUBTOTAL 12 ENGINEERING DURING CONS	12315	0.00	0	12315	30	3694	16009	3722	19731
320001	A-FARM EXPOSE PIPE, CUT AND CAP	18252	0.00	0	18252	30	5475	23727	4772	28500
320002	AX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320003	B-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320006	C-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320007	S-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	18928	30	5678	24606	4949	29556
320009	T-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	18928	30	5678	24606	4949	29556
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	3785	0.00	0	3785	30	1135	4921	989	5911
320012	U-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
	SUBTOTAL 32 FIXED PRICE CONSTRUCTIO	135605	0.00	0	135605	30	40681	176287	35460	211748
	TOTAL FDNW FLUOR DANIEL NORTHWEST	176655	0.00	0	176655	30	52996	229652	47868	277520
LMHC	LOCHEED MARTIN HANFORD CORP.									
500000	OPERATING CONTRACTOR (LMHC)	30000	0.00	0	30000	30	9000	39000	7449	46449
	TOTAL LMHC LOCHEED MARTIN HANFORD CORP	30000	0.00	0	30000	30	9000	39000	7449	46449
PROJECT TOTAL		206,655	0.00	0	206,655	30	61,996	268,652	55,317	323,969

I-B-23

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAP1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 6 OF 8
 DATE 08/05/99 13:11:33
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
111100	DEFINITIVE DESIGN	28735	0.00	0	0	0	28735
	SUBTOTAL 11 DEFINITIVE DESIGN	28735		0	0	0	28735
121100	ENGINEERING DURING CONSTRUCTION	12315	0.00	0	0	0	12315
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	41050		0	0	0	41050
320001	A-FARM EXPOSE PIPE, CUT AND CAP	13500	35.20	4752	0	4752	18252
320002	AK-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320003	B-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320006	C-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320007	S-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	35.20	4928	0	4928	18928
320009	T-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	35.20	4928	0	4928	18928
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	35.20	985	0	985	3785
320012	U-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	100300		35305	0	35305	135605
500000	OPERATING CONTRACTOR (LMHC)	30000	0.00	0	0	0	30000
PROJECT TOTAL		171,350		35,305	0	35,305	206,655

I-B-24

WBS	DESCRIPTION	ESTIMATE	DYN	PDR GFS/G&A	CONST.MGMT	P.F./S.C.	LABOR	MATERIAL	SUBTOTAL	SITE ALLOC
11100	DEFINITIVE DESIGN	28735	71	0	0	0	6609	0	6680	0
SUBTOTAL 11	DEFINITIVE DESIGN	28735	71	0	0	0	6609	0	6680	0
12100	ENGINEERING DURING CONSTRUCTION	12315	30	0	0	0	2832	0	2863	0
SUBTOTAL 12	ENGINEERING DURING CONSTRUCTION	12315	30	0	0	0	2832	0	2863	0
32001	A-FARM EXPOSE PIPE, CUT AND CAP	13500	0	1092	2578	0	0	0	3671	0
32002	X-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32003	B-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32004	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32005	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32006	C-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32007	S-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32008	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	0	1133	2674	0	0	0	3807	0
32009	T-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
32010	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	0	1133	2674	0	0	0	3807	0
32011	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	0	226	534	0	0	0	761	0
32012	U-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	0	1903	0
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	100300	0	8120	19157	0	0	0	27277	0
50000	OPERATING CONTRACTOR (LMHC)	30000	0	0	5730	0	0	0	5730	0
PROJECT TOTAL		171,350	102	8,120	24,887	9,441	0	0	42,551	0

** FIRST - INTERACTIVE ESTIMATING **
 LOCKHEED MARTIN
 JOB NO. 1696
 FILE NO. 1696SAP1
 ORDER OF MAGNITUDE
 PHNCR06 - SITE ALLOCATIONS BY WBS
 INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
 DATE 08/05/99 13:11:58
 BY KLR/DLG
 PAGE 7 OF 8

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAP1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE CAPPING)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 8 OF 8
 DATE 08/05/99 13:11:40
 BY XLR/DLG

WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB		CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL		%	TOTAL	TOTAL	%	TOTAL		
111100	DEFINITIVE DESIGN	6680		0.00	0	6680	30	2004	8685	
	SUBTOTAL 11 DEFINITIVE DESIGN	6680		0.00	0	6680	30	2004	8685	
121100	ENGINEERING DURING CONSTRUCTION	2863		0.00	0	2863	30	858	3722	
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	2863		0.00	0	2863	30	858	3722	
320001	A-FARM EXPOSE PIPE, CUT AND CAP	3671		0.00	0	3671	30	1101	4772	
320002	AX-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320003	B-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320004	BX-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320005	BY-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320006	C-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320007	S-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320008	SX-FARM EXPOSE PIPE, CUT AND CAP	3807		0.00	0	3807	30	1142	4949	
320009	T-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
320010	TX-FARM EXPOSE PIPE, CUT AND CAP	3807		0.00	0	3807	30	1142	4949	
320011	TY-FARM EXPOSE PIPE, CUT AND CAP	761		0.00	0	761	30	228	989	
320012	U-FARM EXPOSE PIPE, CUT AND CAP	1903		0.00	0	1903	30	571	2474	
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	27277		0.00	0	27277	30	8183	35460	
500000	OPERATING CONTRACTOR (LMHC)	5730		0.00	0	5730	30	1719	7449	
PROJECT TOTAL		42,551		0.00	0	42,551	30	12,765	55,317	

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 18
 DATE 08/17/99 15:11:59
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	TOTAL	TOTAL DOLLARS
PDNW	FLUOR DANIEL NORTHWEST	330,000	30	100,000	430,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	80,000	30	20,000	100,000
SUBTOTAL		410,000	30	120,000	530,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	80,000	30	20,000	100,000
PROJECT TOTAL		490,000	30	140,000	630,000

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TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/17/99	REMARKS:
PDNW LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	
PROJECT MANAGER			
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

PLON DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING **
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1
 ORDER OF MAGNITUDE
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 PPHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY
 PAGE 2 OF 18
 DATE 08/17/99 15:12:06
 BY KLR/DLG

WBS DESCRIPTION	ESTIMATE	ESCALATION	SUB TOTAL	CONTINGENCY	SUB TOTAL	SUB	SITE	TOTAL
		% TOTAL		% TOTAL			ALLOCATION	DOLLARS
11100 DEFINITIVE DESIGN	52544	0.00	52544	15763	68307		15881	84188
SUBTOTAL 11 DEFINITIVE DESIGN	52544	0.00	52544	15763	68307		15881	84188
12100 ENGINEERING DURING CONSTRUCTION	22578	0.00	22578	6773	29351		6824	36175
SUBTOTAL 12 ENGINEERING DURING CONSTRUCTION	22578	0.00	22578	6773	29351		6824	36175
320011 A-FARM EXPOSE PIPE, CUT AND CAP	18252	0.00	18252	5475	23727		4772	28500
320012 A-FARM GROUT PIPES	28878	0.00	28878	8663	37542		7551	45094
SUBTOTAL 32001 241-A FARM	47130	0.00	47130	14139	61269		12324	73594
320021 AX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	9464	2839	12303		2474	14778
320022 AX-FARM GROUT PIPES	6489	0.00	6489	1946	8436		1697	10133
SUBTOTAL 32002 241-AX FARM	15953	0.00	15953	4786	20739		4171	24911
3220031 B-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	9464	2839	12303		2474	14778
3220032 B-FARM GROUT PIPES	4867	0.00	4867	1460	6327		1272	7600
SUBTOTAL 32003 241-B FARM	14331	0.00	14331	4299	18630		3747	22378
320041 BX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	9464	2839	12303		2474	14778
320042 BX-FARM GROUT PIPES	5516	0.00	5516	1654	7171		1442	8613
SUBTOTAL 32004 241-BX FARM	14980	0.00	14980	4494	19474		3917	23391
320051 BY-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	9464	2839	12303		2474	14778
320052 BY-FARM GROUT PIPES	4867	0.00	4867	1460	6327		1272	7600
SUBTOTAL 32005 241-BY FARM	14331	0.00	14331	4299	18630		3747	22378
320061 C-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	9464	2839	12303		2474	14778

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 3 OF 18
 DATE 08/17/99 15:12:06
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
320062	C-FARM GROUT PIPES	4867	0.00	0	30	1460	1272	7600
	SUBTOTAL 32006 241-C FARM	14331	0.00	0	30	4299	3747	22378
320071	S-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	2474	14778
320072	S-FARM GROUT PIPES	21091	0.00	0	30	6327	5515	32933
	SUBTOTAL 32007 241-S FARM	30555	0.00	0	30	9166	7990	47711
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	30	5678	4949	29556
320082	SX-FARM GROUT PIPES	15899	0.00	0	30	4769	4157	24827
	SUBTOTAL 32008 241-SX FARM	34827	0.00	0	30	10448	9107	54383
320091	T-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	2474	14778
320092	T-FARM GROUT PIPES	3893	0.00	0	30	1168	1018	6080
	SUBTOTAL 32009 241-T FARM	13357	0.00	0	30	4007	3493	20858
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	30	5678	4949	29556
320102	TX-FARM GROUT PIPES	12979	0.00	0	30	3893	3394	20267
	SUBTOTAL 32010 241-TX FARM	31907	0.00	0	30	9572	8343	49823
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	3785	0.00	0	30	1135	989	5911
320112	TY-FARM GROUT PIPES	3569	0.00	0	30	1070	933	5573
	SUBTOTAL 32011 241-TY FARM	7354	0.00	0	30	2206	1923	11484
320121	U-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	30	2839	2474	14778
320122	U-FARM GROUT PIPES	3244	0.00	0	30	973	848	5066
	SUBTOTAL 32012 241-U FARM	12708	0.00	0	30	3812	3323	19844
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	251769	0.00	0	30	75530	65837	393138

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FLOOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 4 OF 18
 DATE 08/17/99 15:12:06
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)	75000	0.00	0	30	22500	18622	116122
PROJECT TOTAL		401,891	0.00	401,891	30	120,567	107,165	629,624

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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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 35.2% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT

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 FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AR.CM RATES.

E. SITE ALLOCATIONS FACTORS:

SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (PDH) FOR ESTIMATING USE.

- (1) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) PDH GFS/G&A CONST. MGMT: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.00%
(3) PDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) PDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.00%
(5) PDH G&A OF 19.1% APPLIED TO LHMC PROJECT COSTS

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

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 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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS.

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHNCR04 - COMPANY/WBS SUMMARY

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 DATE 08/17/99 15:12:21
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE		ESCALATION		SUB		CONTINGENCY		SUB		SITE ALLOCAT'N	TOTAL DOLLARS
		SUBTOTAL	%	TOTAL	%	TOTAL	%	TOTAL	TOTAL	TOTAL			
FDNW	FLUOR DANIEL NORTHWEST												
111100	DEFINITIVE DESIGN	52544	0.00	0		52544	30	15763		68307	15881	84188	
	SUBTOTAL 11 DEFINITIVE DESIGN	52544	0.00	0		52544	30	15763		68307	15881	84188	
121100	ENGINEERING DURING CONSTRUCTION	22578	0.00	0		22578	30	6773		29351	6824	36175	
	SUBTOTAL 12 ENGINEERING DURING CONS	22578	0.00	0		22578	30	6773		29351	6824	36175	
320011	A-FARM EXPOSE PIPE, CUT AND CAP	18252	0.00	0		18252	30	5475		23727	4772	28500	
320012	A-FARM GROUT PIPES	28878	0.00	0		28878	30	8663		37542	7551	45094	
	SUBTOTAL 32001 241-A FARM	47130	0.00	0		47130	30	14139		61269	12324	73594	
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0		9464	30	2839		12303	2474	14778	
320022	AX-FARM GROUT PIPES	6489	0.00	0		6489	30	1946		8436	1697	10133	
	SUBTOTAL 32002 241-AX FARM	15953	0.00	0		15953	30	4786		20739	4171	24911	
320031	B-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0		9464	30	2839		12303	2474	14778	
320032	B-FARM GROUT PIPES	4867	0.00	0		4867	30	1460		6327	1272	7600	
	SUBTOTAL 32003 241-B FARM	14331	0.00	0		14331	30	4299		18630	3747	22378	
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0		9464	30	2839		12303	2474	14778	
320042	BX-FARM GROUT PIPES	5516	0.00	0		5516	30	1654		7171	1442	8613	
	SUBTOTAL 32004 241-BX FARM	14980	0.00	0		14980	30	4494		19474	3917	23391	
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0		9464	30	2839		12303	2474	14778	
320052	BY-FARM GROUT PIPES	4867	0.00	0		4867	30	1460		6327	1272	7600	
	SUBTOTAL 32005 241-BY FARM	14331	0.00	0		14331	30	4299		18630	3747	22378	
320061	C-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0		9464	30	2839		12303	2474	14778	

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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 DATE 08/17/99 15:12:21
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
320062	C-FARM GROUT PIPES	4867	0.00	0	4867	30	1460	6327	1272	7600
	SUBTOTAL 32006 241-C FARM	14331	0.00	0	14331	30	4299	18630	3747	22378
320071	S-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320072	S-FARM GROUT PIPES	21091	0.00	0	21091	30	6327	27418	5515	32933
	SUBTOTAL 32007 241-S FARM	30555	0.00	0	30555	30	9166	39721	7990	47711
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	18928	30	5678	24606	4949	29556
320082	SX-FARM GROUT PIPES	15899	0.00	0	15899	30	4769	20669	4157	24827
	SUBTOTAL 32008 241-SX FARM	34827	0.00	0	34827	30	10448	45275	9107	54383
320091	T-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320092	T-FARM GROUT PIPES	3893	0.00	0	3893	30	1168	5061	1018	6080
	SUBTOTAL 32009 241-T FARM	13357	0.00	0	13357	30	4007	17365	3493	20858
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	18928	0.00	0	18928	30	5678	24606	4949	29556
320102	TX-FARM GROUT PIPES	12979	0.00	0	12979	30	3893	16872	3394	20267
	SUBTOTAL 32010 241-TX FARM	31907	0.00	0	31907	30	9572	41479	8343	49823
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	3785	0.00	0	3785	30	1135	4921	989	5911
320112	TY-FARM GROUT PIPES	3569	0.00	0	3569	30	1070	4640	933	5573
	SUBTOTAL 32011 241-TY FARM	7354	0.00	0	7354	30	2206	9561	1923	11484
320121	U-FARM EXPOSE PIPE, CUT AND CAP	9464	0.00	0	9464	30	2839	12303	2474	14778
320122	U-FARM GROUT PIPES	3244	0.00	0	3244	30	973	4218	848	5066
	SUBTOTAL 32012 241-U FARM	12708	0.00	0	12708	30	3812	16521	3323	19844
	SUBTOTAL 32 FIXED PRICE CONSTRUCTIO	251769	0.00	0	251769	30	75530	327300	65837	393138

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

PAGE 9 OF 18
 DATE 08/17/99 15:12:21
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		

	TOTAL PDNW FLUOR DANIEL NORTHWEST	326891	0.00	0	326891	30	98067	424958	88543	513502
LMHC	LOCKHEED MARTIN HANFORD CORP.									
500000	OPERATING CONTRACTOR (LMHC)	75000	0.00	0	75000	30	22500	97500	18622	116122
	TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	75000	0.00	0	75000	30	22500	97500	18622	116122

	PROJECT TOTAL	401,891	0.00	0	401,891	30	120,567	522,458	107,165	629,624

I-B-35

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 10 OF 18
 DATE 08/17/99 15:12:28
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
111100	DEFINITIVE DESIGN	52544	0.00	0	0	0	52544
	SUBTOTAL 11 DEFINITIVE DESIGN	52544		0	0	0	52544
121100	ENGINEERING DURING CONSTRUCTION	22578	0.00	0	0	0	22578
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	75122		0	0	0	75122
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	35.20	4752	0	4752	18252
320012	A-FARM GROUT PIPES	21360	35.20	7518	0	7518	28878
	SUBTOTAL 32001 241-A FARM	34860		12270	0	12270	47130
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320022	AX-FARM GROUT PIPES	4800	35.20	1689	0	1689	6489
	SUBTOTAL 32002 241-AX FARM	46660		16424	0	16424	63084
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320032	B-FARM GROUT PIPES	3600	35.20	1267	0	1267	4867
	SUBTOTAL 32003 241-B FARM	57260		20155	0	20155	77415
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320042	BX-FARM GROUT PIPES	4080	35.20	1436	0	1436	5516
	SUBTOTAL 32004 241-BX FARM	68340		24055	0	24055	92395
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320052	BY-FARM GROUT PIPES	3600	35.20	1267	0	1267	4867
	SUBTOTAL 32005 241-BY FARM	78940		27786	0	27786	106726
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 11 OF 18
 DATE 08/17/99 15:12:28
 BY KLR/DLG

NBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
320062	C-FARM GROUT PIPES	3600	35.20	1267	0	1267	4867
	SUBTOTAL 32006 241-C FARM	89540		31518	0	31518	121058
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320072	S-FARM GROUT PIPES	15600	35.20	5491	0	5491	21091
	SUBTOTAL 32007 241-S FARM	112140		39473	0	39473	151613
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	35.20	4928	0	4928	18928
320082	SX-FARM GROUT PIPES	11760	35.20	4139	0	4139	15899
	SUBTOTAL 32008 241-SX FARM	137900		48540	0	48540	186440
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320092	T-FARM GROUT PIPES	2880	35.20	1013	0	1013	3893
	SUBTOTAL 32009 241-T FARM	147780		52018	0	52018	199798
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	35.20	4928	0	4928	18928
320102	TX-FARM GROUT PIPES	9600	35.20	3379	0	3379	12979
	SUBTOTAL 32010 241-TX FARM	171380		60325	0	60325	231705
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	35.20	985	0	985	3785
320112	TY-FARM GROUT PIPES	2640	35.20	929	0	929	3569
	SUBTOTAL 32011 241-TY FARM	176820		62240	0	62240	239060
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	35.20	2464	0	2464	9464
320122	U-FARM GROUT PIPES	2400	35.20	844	0	844	3244
	SUBTOTAL 32012 241-U FARM	186220		65549	0	65549	251769
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	186220		65549	0	65549	251769

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FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
ORDER OF MAGNITUDE
PHNCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 12 OF 18
DATE 08/17/99 15:12:28
BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION & TOTAL	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
500000	OPERATING CONTRACTOR (LMHC)	75000	0.00	0	0	0	75000
PROJECT TOTAL		336,342		65,549	0	65,549	401,891

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

PAGE 13 OF 18
 DATE 08/17/99 15:12:51
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GFS/G&A CONST.MGMT	FDH MPR F.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	52544	131	0	0	12085	0	12216
	SUBTOTAL 11 DEFINITIVE DESIGN	52544	131	0	0	12085	0	12216
121100	ENGINEERING DURING CONSTRUCTION	22578	56	0	0	5192	0	5249
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	22578	56	0	0	5192	0	5249
320011	A-FARM EXPOSE PIPE, CUT AND CAP	13500	0	1092	2578	0	0	3671
320012	A-FARM GROUT PIPES	21360	0	1729	4079	0	0	5809
	SUBTOTAL 32001 241-A FARM	34860	0	2822	6658	0	0	9480
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320022	AX-FARM GROUT PIPES	4800	0	388	916	0	0	1305
	SUBTOTAL 32002 241-AX FARM	11800	0	955	2253	0	0	3209
320031	B-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320032	B-FARM GROUT PIPES	3600	0	291	687	0	0	979
	SUBTOTAL 32003 241-B FARM	10600	0	858	2024	0	0	2882
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320042	BX-FARM GROUT PIPES	4080	0	330	779	0	0	1109
	SUBTOTAL 32004 241-BX FARM	11080	0	897	2116	0	0	3013
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320052	BY-FARM GROUT PIPES	3600	0	291	687	0	0	979
	SUBTOTAL 32005 241-BY FARM	10600	0	858	2024	0	0	2882
320061	C-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

PAGE 14 OF 18
 DATE 08/17/99 15:12:51
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ. USAGE	FDH GFS/G&A CONST. MOMT	FDH MPR F.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
320062	C-FARM GROUT PIPES	3600	0	291	687	0	0	979
	SUBTOTAL 32006 241-C FARM	10600	0	858	2024	0	0	2882
320071	S-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320072	S-FARM GROUT PIPES	15600	0	1262	2979	0	0	4242
	SUBTOTAL 32007 241-S FARM	22600	0	1829	4316	0	0	6146
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	14000	0	1133	2674	0	0	3807
320082	SX-FARM GROUT PIPES	11760	0	952	2246	0	0	3198
	SUBTOTAL 32008 241-SX FARM	25760	0	2085	4920	0	0	7005
320091	T-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320092	T-FARM GROUT PIPES	2880	0	233	550	0	0	783
	SUBTOTAL 32009 241-T FARM	9880	0	799	1887	0	0	2686
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	14000	0	1133	2674	0	0	3807
320102	TX-FARM GROUT PIPES	9600	0	777	1833	0	0	2610
	SUBTOTAL 32010 241-TX FARM	23600	0	1910	4507	0	0	6418
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	2800	0	226	534	0	0	761
320112	TY-FARM GROUT PIPES	2640	0	213	504	0	0	717
	SUBTOTAL 32011 241-TY FARM	5440	0	440	1039	0	0	1479
320121	U-FARM EXPOSE PIPE, CUT AND CAP	7000	0	566	1337	0	0	1903
320122	U-FARM GROUT PIPES	2400	0	194	458	0	0	652
	SUBTOTAL 32012 241-U FARM	9400	0	760	1795	0	0	2556
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	186220	0	15076	35568	0	0	50644

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

PAGE 15 OF 18
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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GPS/G&A CONST.MGMT	FDH MPR P.P./S.C.	FDH GPS/G&A LABOR	FDH.MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
500000	OPERATING CONTRACTOR (LMHC)	75000	0	0	14325	0	0	14325
PROJECT TOTAL		336,342	187	15,076	49,893	17,278	0	82,435

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAQ1

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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 DATE 08/17/99 15:12:35
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
			%	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	12216	0.00	0	12216	30	3664	15881
	SUBTOTAL 11 DEFINITIVE DESIGN	12216	0.00	0	12216	30	3664	15881
121100	ENGINEERING DURING CONSTRUCTION	5249	0.00	0	5249	30	1574	6824
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	5249	0.00	0	5249	30	1574	6824
320011	A-FARM EXPOSE PIPE, CUT AND CAP	3671	0.00	0	3671	30	1101	4772
320012	A-FARM GROUT PIPES	5809	0.00	0	5809	30	1742	7551
	SUBTOTAL 32001 241-A FARM	9480	0.00	0	9480	30	2844	12324
320021	AX-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	0	1903	30	571	2474
320022	AX-FARM GROUT PIPES	1305	0.00	0	1305	30	391	1697
	SUBTOTAL 32002 241-AX FARM	3209	0.00	0	3209	30	962	4171
320031	B-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	0	1903	30	571	2474
320032	B-FARM GROUT PIPES	979	0.00	0	979	30	293	1272
	SUBTOTAL 32003 241-B FARM	2882	0.00	0	2882	30	864	3747
320041	BX-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	0	1903	30	571	2474
320042	BX-FARM GROUT PIPES	1109	0.00	0	1109	30	332	1442
	SUBTOTAL 32004 241-BX FARM	3013	0.00	0	3013	30	904	3917
320051	BY-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	0	1903	30	571	2474
320052	BY-FARM GROUT PIPES	979	0.00	0	979	30	293	1272
	SUBTOTAL 32005 241-BY FARM	2882	0.00	0	2882	30	864	3747
320061	C-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	0	1903	30	571	2474

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FLOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** BEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

320062 C-FARM GROUT PIPES
 SUBTOTAL 32006 241-C FARM
 320071 S-FARM EXPOSE PIPE, CUT AND CAP
 320072 S-FARM GROUT PIPES
 SUBTOTAL 32007 241-S FARM.
 320081 SX-FARM EXPOSE PIPE, CUT AND CAP
 320082 SX-FARM GROUT PIPES
 SUBTOTAL 32008 241-SX FARM
 320091 T-FARM EXPOSE PIPE, CUT AND CAP
 320092 T-FARM GROUT PIPES
 SUBTOTAL 32009 241-T FARM
 320101 TX-FARM EXPOSE PIPE, CUT AND CAP
 320102 TX-FARM GROUT PIPES
 SUBTOTAL 32010 241-TX FARM
 320111 TY-FARM EXPOSE PIPE, CUT AND CAP
 320112 TY-FARM GROUT PIPES
 SUBTOTAL 32011 241-TY FARM
 320121 U-FARM EXPOSE PIPE, CUT AND CAP
 320122 U-FARM GROUT PIPES
 SUBTOTAL 32012 241-U FARM
 SUBTOTAL 32 FIXED PRICE CONSTRUCTION

PAGE 17 OF 18
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 BY KLR/DLG

NBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION \$ TOTAL	SUB TOTAL	CONTINGENCY \$ TOTAL	TOTAL DOLLARS
320062	C-FARM GROUT PIPES	979	0.00	979	30	1272
SUBTOTAL 32006 241-C FARM		2882	0.00	2882	30	3747
320071	S-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	1903	30	2474
320072	S-FARM GROUT PIPES	4242	0.00	4242	30	5515
SUBTOTAL 32007 241-S FARM.		6146	0.00	6146	30	7990
320081	SX-FARM EXPOSE PIPE, CUT AND CAP	3807	0.00	3807	30	4949
320082	SX-FARM GROUT PIPES	3198	0.00	3198	30	4157
SUBTOTAL 32008 241-SX FARM		7005	0.00	7005	30	9107
320091	T-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	1903	30	2474
320092	T-FARM GROUT PIPES	783	0.00	783	30	1018
SUBTOTAL 32009 241-T FARM		2686	0.00	2686	30	3493
320101	TX-FARM EXPOSE PIPE, CUT AND CAP	3807	0.00	3807	30	4949
320102	TX-FARM GROUT PIPES	2610	0.00	2610	30	3394
SUBTOTAL 32010 241-TX FARM		6418	0.00	6418	30	8343
320111	TY-FARM EXPOSE PIPE, CUT AND CAP	761	0.00	761	30	989
320112	TY-FARM GROUT PIPES	717	0.00	717	30	933
SUBTOTAL 32011 241-TY FARM		1479	0.00	1479	30	1923
320121	U-FARM EXPOSE PIPE, CUT AND CAP	1903	0.00	1903	30	2474
320122	U-FARM GROUT PIPES	652	0.00	652	30	848
SUBTOTAL 32012 241-U FARM		2556	0.00	2556	30	3323
SUBTOTAL 32 FIXED PRICE CONSTRUCTION		50644	0.00	50644	30	65837

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAG1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (WATERLINE GROUT & CAP)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 18 OF 18
 DATE 08/17/99 15:12:35
 BY KLR/DLG

WBS DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	TOTAL DOLLARS	
500000 OPERATING CONTRACTOR (LNHC)	14325	0.00	0	30	4297	18622
PROJECT TOTAL	82,435	0.00	0	30	24,730	107,165

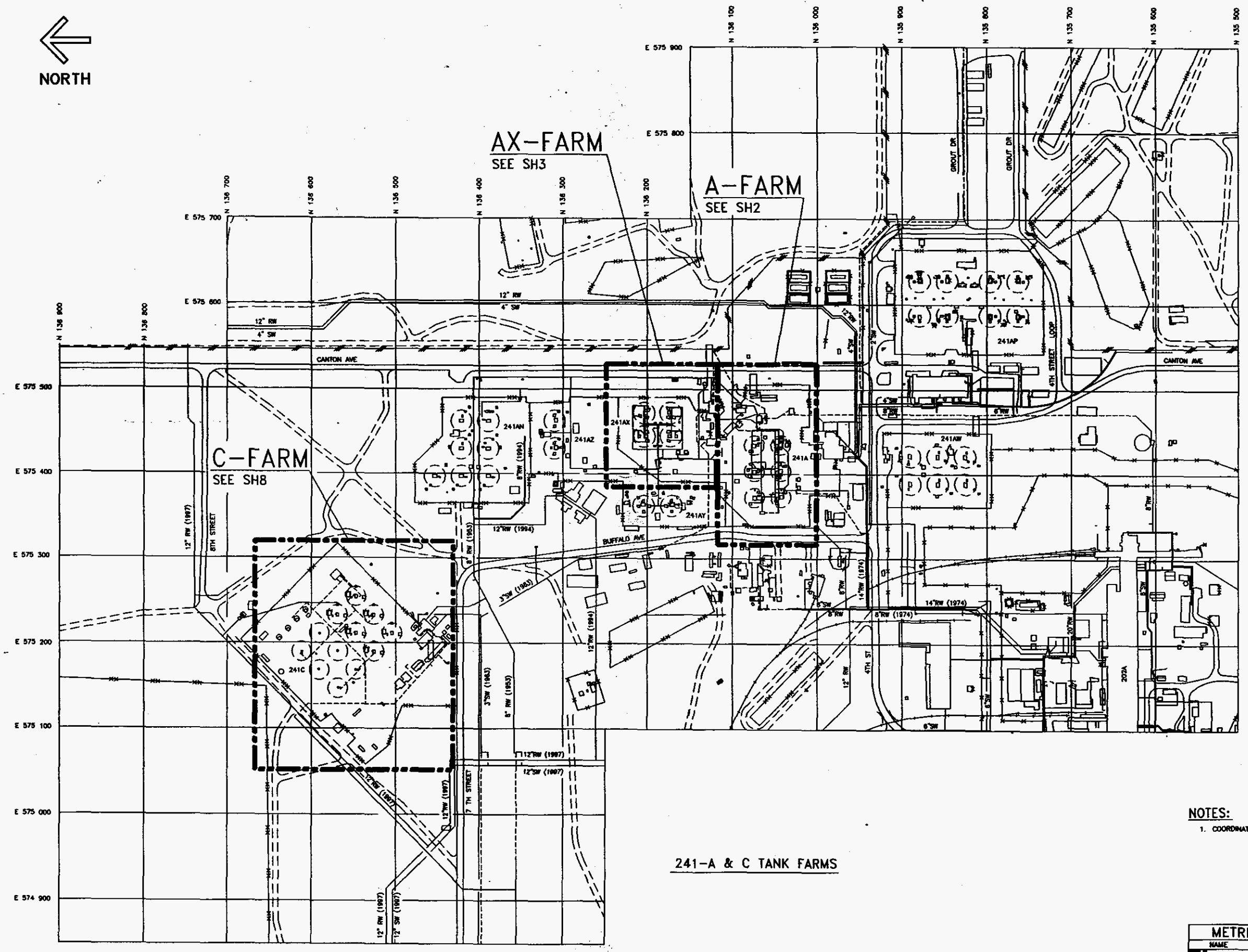
I-B-44

APPENDIX C
DRAWINGS



LEGEND:

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



AX-FARM
SEE SH3

A-FARM
SEE SH2

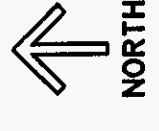
C-FARM
SEE SH8

241-A & C TANK FARMS

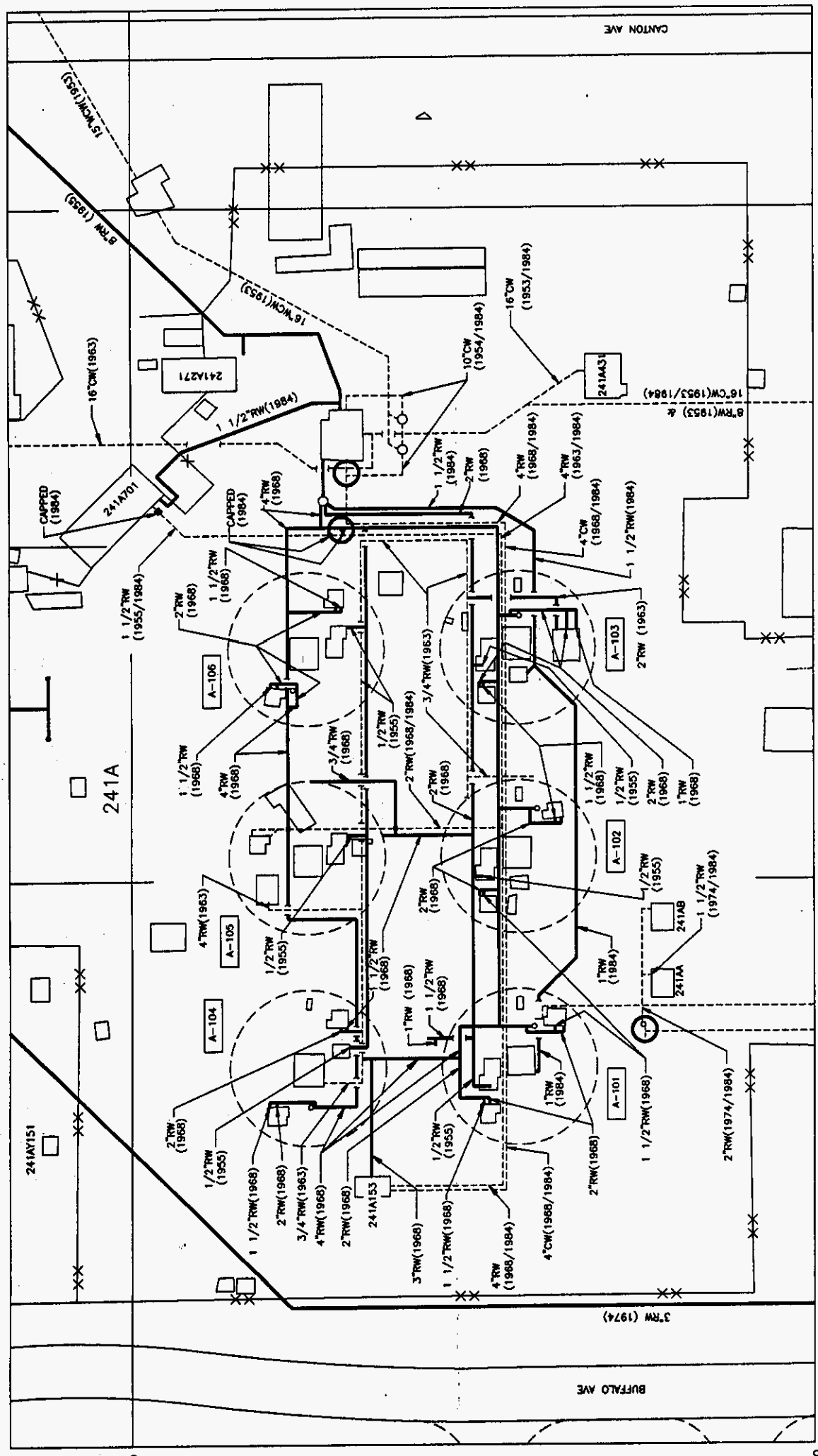
NOTES:
1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

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

METRIC		U.S. DEPARTMENT OF ENERGY Richland Operations Office
NAME	DATE	
WH CROWLEY JR		CIVIL / ENVIR WATER LINES 241-A & C TANK FARMS
DATE	SCALE	ES-050051-C2.0



NORTH



LEGEND:
 --- WATER LINE (ACTIVE)
 --- WATER LINE (ABANDONED)
 --- FENCE
 --- LAMBERT COORDINATES (METERS)
 --- E 574 000
 --- (DATE)
 --- (DATE/DATE)
 --- TANK NUMBER
 --- POTTHOLE

NOTES:
 1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-A FARM

REF NUMBER	TITLE
H-2-53736	KEY PLAN
H-2-54780	UGRD PIPING PLAN
H-2-54780	PLAT PLAN & PIPING LIT
H-2-54780	EX OF PIPING TO EXISTING LIT
H-2-54780	EX OF PIPING TO EXISTING LIT
H-2-54780	EX OF PIPING TO EXISTING LIT
H-2-55001	241 - GEN. LAYOUT
H-2-55001	ENERG. FL. DIA. OUTSIDE UTIL. LINES
H-2-55001	AREA MAP ZONE 'A' PLANT FACIL.
H-2-55001	SW & RW MAP ZONE EAST AREA
H-2-54505	PLAN SURVEY FOR EXIST. PIPING
H-2-54505	PLAN SURVEY FOR EXIST. PIPING
H-2-53981	REF. SURVEY TO EXIST. PIPING

REF NUMBER	TITLE
H-14-1011A	PIPING PLAN 241-A TO 241-A
H-14-1011A	PIPING PLAN 241-A TO 241-A
H-14-1011A	PIPING PLAN 241-A TO 241-A
H-2-131003	CIVIL BLDG. SITE PLAN
H-2-93818	PIPING CONTROL WITH 241-A TR. FARM
H-2-93749	ENERG. FL. DIA. 241-A TR. FARM
H-2-69206	CIVIL PLAN 241-A TR. FARM
H-2-69240	CIVIL PLAN 241-A TR. FARM
H-2-69180	PIPING PLAN 241-A TR. FARM
H-2-69184	PIPING PLAN 241-A TR. FARM
H-2-67565	RW LINES BACKFLOW PREVENTER INST.

DWG NO	TITLE
ES-050051-C2	SH1

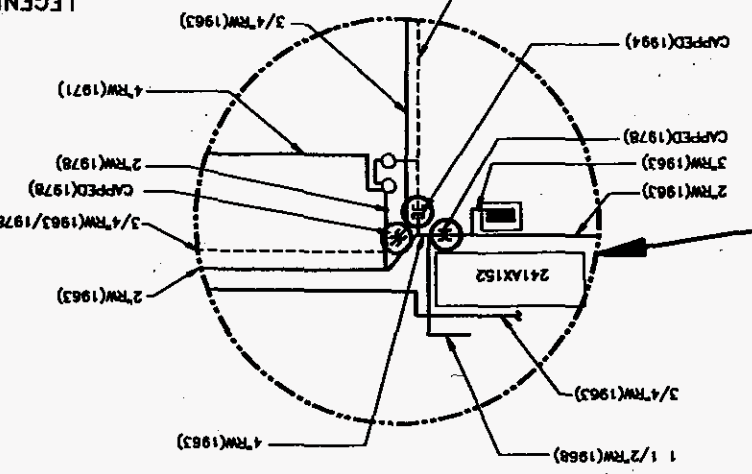
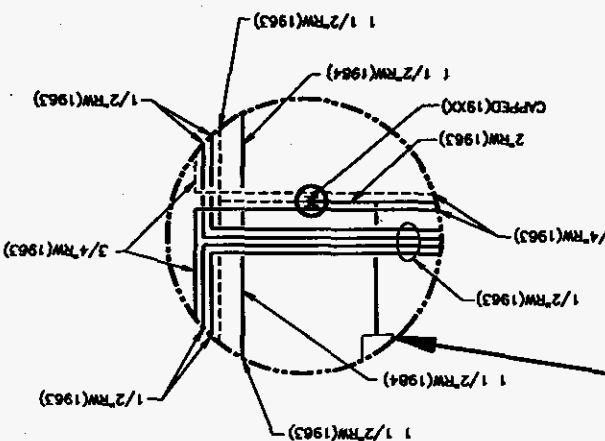
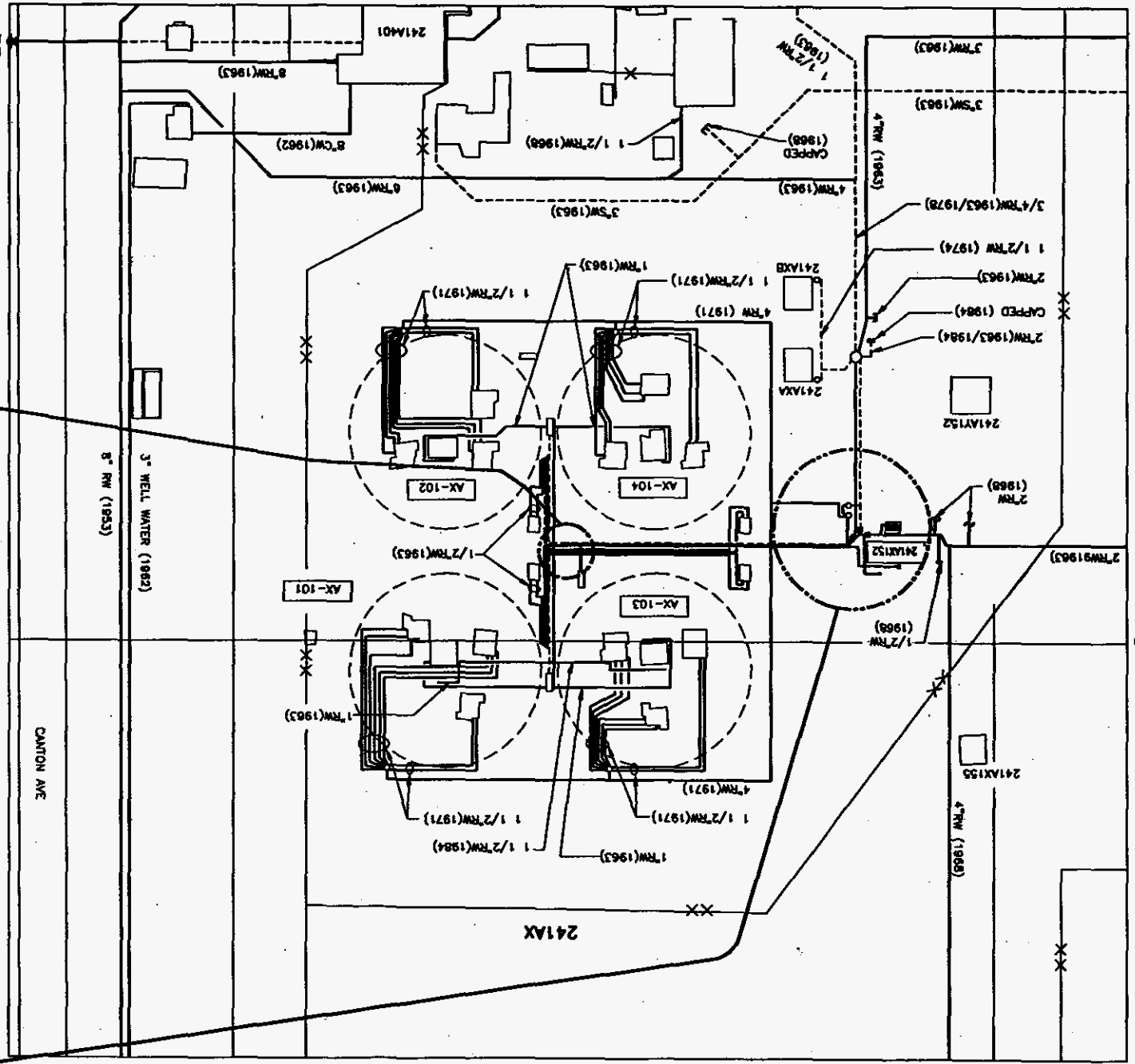
REF NUMBER	TITLE
H-2-53736	KEY PLAN
H-2-54780	UGRD PIPING PLAN
H-2-54780	PLAT PLAN & PIPING LIT
H-2-54780	EX OF PIPING TO EXISTING LIT
H-2-54780	EX OF PIPING TO EXISTING LIT
H-2-54780	EX OF PIPING TO EXISTING LIT
H-2-55001	241 - GEN. LAYOUT
H-2-55001	ENERG. FL. DIA. OUTSIDE UTIL. LINES
H-2-55001	AREA MAP ZONE 'A' PLANT FACIL.
H-2-55001	SW & RW MAP ZONE EAST AREA
H-2-54505	PLAN SURVEY FOR EXIST. PIPING
H-2-54505	PLAN SURVEY FOR EXIST. PIPING
H-2-53981	REF. SURVEY TO EXIST. PIPING



No.	DWG /	POTENTIAL OR COMPLETED	DATE NOT RECORDED/COMPLETED
1	H-2-8414	ES-050051-C2	
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REF. NO.	REF. TITLE	REF. DATE
H-2-8230	103-AK TR ANCHOR AS-BUAL	
H-2-8230	102-AK TR ANCHOR AS-BUAL	
H-2-8230	101-AK TR ANCHOR AS-BUAL	
H-2-8230	100-AK TR ANCHOR AS-BUAL	
H-2-8230	99-AK TR ANCHOR AS-BUAL	
H-2-8230	98-AK TR ANCHOR AS-BUAL	
H-2-8230	97-AK TR ANCHOR AS-BUAL	
H-2-8230	96-AK TR ANCHOR AS-BUAL	
H-2-8230	95-AK TR ANCHOR AS-BUAL	
H-2-8230	94-AK TR ANCHOR AS-BUAL	
H-2-8230	93-AK TR ANCHOR AS-BUAL	
H-2-8230	92-AK TR ANCHOR AS-BUAL	
H-2-8230	91-AK TR ANCHOR AS-BUAL	
H-2-8230	90-AK TR ANCHOR AS-BUAL	
H-2-8230	89-AK TR ANCHOR AS-BUAL	
H-2-8230	88-AK TR ANCHOR AS-BUAL	
H-2-8230	87-AK TR ANCHOR AS-BUAL	
H-2-8230	86-AK TR ANCHOR AS-BUAL	
H-2-8230	85-AK TR ANCHOR AS-BUAL	
H-2-8230	84-AK TR ANCHOR AS-BUAL	
H-2-8230	83-AK TR ANCHOR AS-BUAL	
H-2-8230	82-AK TR ANCHOR AS-BUAL	
H-2-8230	81-AK TR ANCHOR AS-BUAL	
H-2-8230	80-AK TR ANCHOR AS-BUAL	
H-2-8230	79-AK TR ANCHOR AS-BUAL	
H-2-8230	78-AK TR ANCHOR AS-BUAL	
H-2-8230	77-AK TR ANCHOR AS-BUAL	
H-2-8230	76-AK TR ANCHOR AS-BUAL	
H-2-8230	75-AK TR ANCHOR AS-BUAL	
H-2-8230	74-AK TR ANCHOR AS-BUAL	
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H-2-8230	72-AK TR ANCHOR AS-BUAL	
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H-2-8230	34-AK TR ANCHOR AS-BUAL	
H-2-8230	33-AK TR ANCHOR AS-BUAL	
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H-2-8230	29-AK TR ANCHOR AS-BUAL	
H-2-8230	28-AK TR ANCHOR AS-BUAL	
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H-2-8230	11-AK TR ANCHOR AS-BUAL	
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H-2-8230	9-AK TR ANCHOR AS-BUAL	
H-2-8230	8-AK TR ANCHOR AS-BUAL	
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H-2-8230	2-AK TR ANCHOR AS-BUAL	
H-2-8230	1-AK TR ANCHOR AS-BUAL	
H-2-8230		

241-AX FARM



- NOTES:**
1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.
- POTHOLE
 - TANK NUMBER
 - (DATE/DATE) INSTALLATION/ABANDONED DATE
 - (DATE) INSTALLATION DATE
 - (E 574 000) LABBERT COORDINATES (METERS)
 - FENCE
 - WATER LINE (ABANDONED)
 - WATER LINE (ACTIVE)
- LEGEND:**
- 4TRW(1983)
 - 3/4TRW(1983)
 - 2TRW(1983)
 - 3/4TRW(1983/1978)
 - CAPPED(1978)
 - 2TRW(1978)
 - 4TRW(1971)
 - CAPPED(1994)
 - 4TRW(1983)
 - 3/4TRW(1983)
 - 2TRW(1983)
 - 1 1/2TRW(1988)
 - 3/4TRW(1983)
 - 2TRW(1983)

REV. NO.	DESCRIPTION	DATE	BY	CHKD.
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METRIC

U.S. DEPARTMENT OF ENERGY
Regional Operations Office
CIVIL / ENVIR
241-AX TANK FARM
ES-050051-C2.0

Page I-C-03

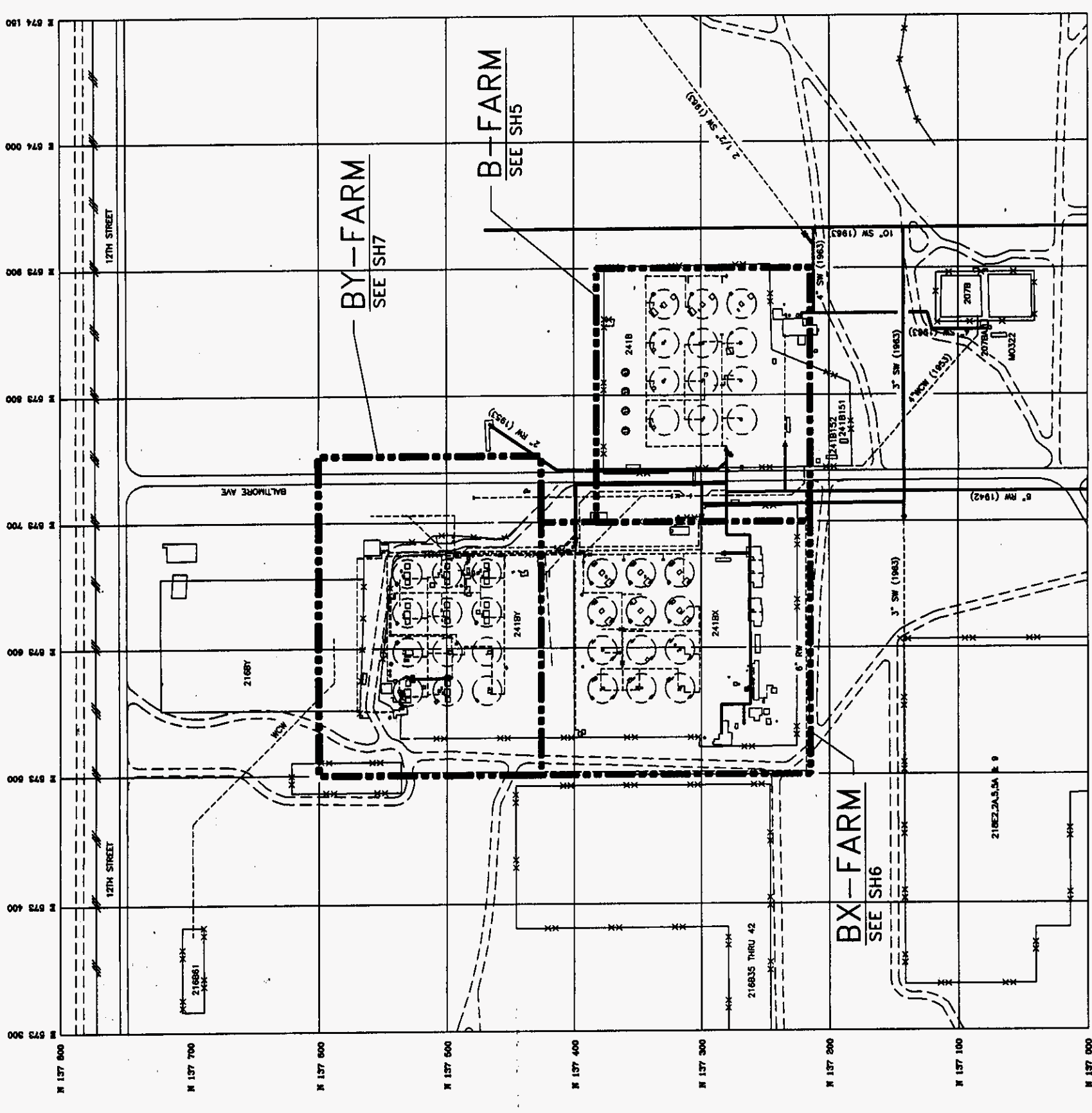
- LEGEND:**
- WATER LINE (ACTIVE)
 - - - - WATER LINE (ABANDONED)
 - x--- FENCE
 - x--- E 574 000 LAMBERT COORDINATES (METERS)
 - x--- (DATE) INSTALLATION DATE
 - x--- (DATE/DATE) INSTALLATION/ABANDONED DATE
 - ☐ TANK NUMBER

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

METRIC	
NAME	DATE
DR. CROSBY JR.	10/15/75

U.S. DEPARTMENT OF ENERGY
 Civil / ENVIR
 WATER LINES
 241-B TANK FARMS
 ES-050051-C210



241-B TANK FARMS

DWG NO	TITLE	REF NUMBER	TITLE

DWG NO	TITLE	REF NUMBER	TITLE

LEGEND:

- WATER LINE (ACTIVE)
- - - WATER LINE (ABANDONED)
- - - FENCE
- - - LAMBERT COORDINATES (METERS)
- E 574 000 (DATE)
- (DATE) INSTALLATION/ABANDONED DATE
- TR-7 TANK NUMBER
- O POTHOLE

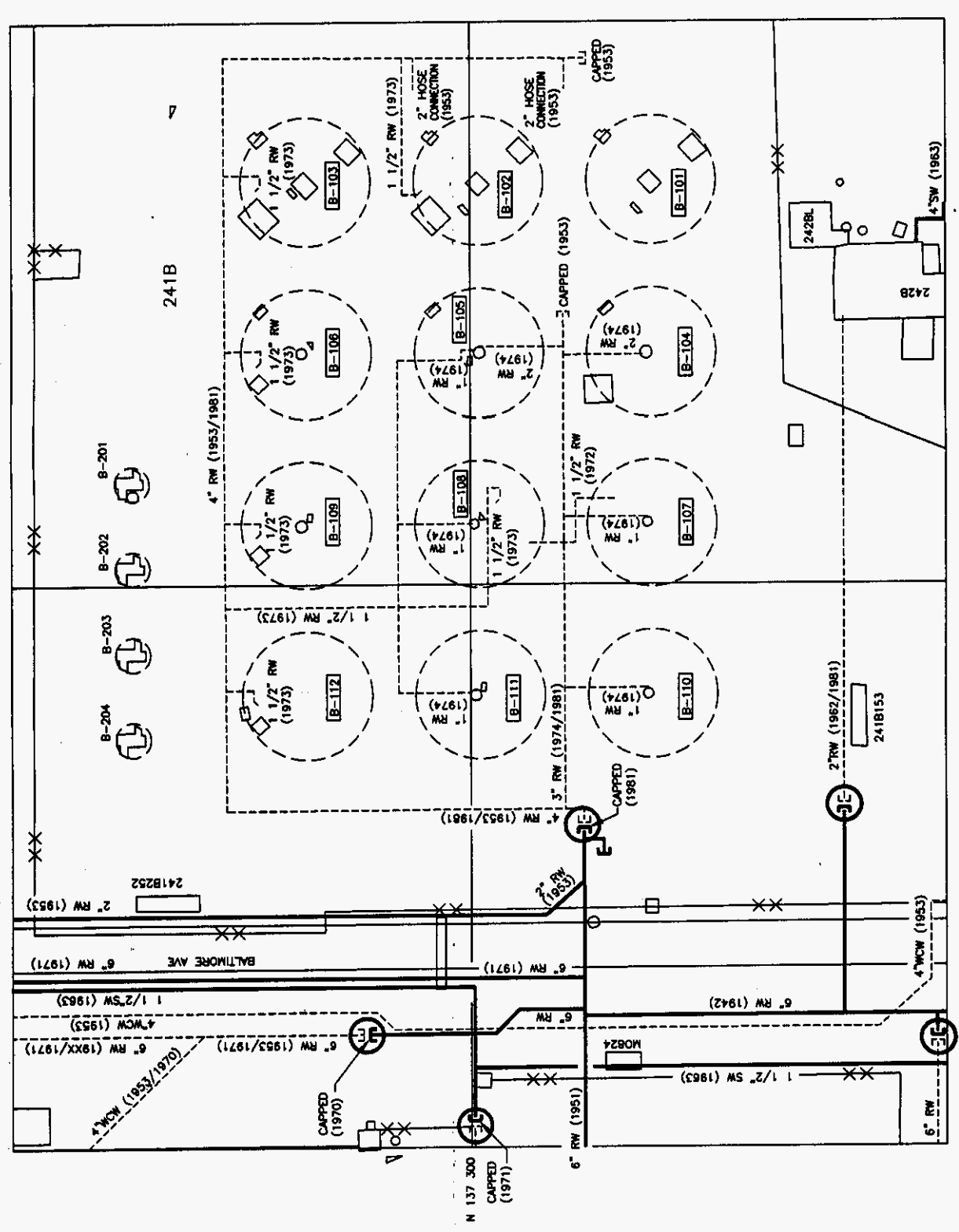
NOTES:

1. COORDINATES ARE REFERENCED TO INDIANAPOLIS STATE GRID SYSTEM.

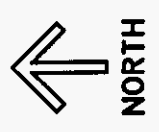
E 573 900

E 573 800

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241-B TANK FARM



METRIC	
NAME	DATE
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U.S. DEPARTMENT OF ENERGY	
National Operations Office	
CIVIL / ENVIR	
WATER LINES	
241-B TANK FARM	
PROJECT NO.	ES-050051-C2.0
DATE	...

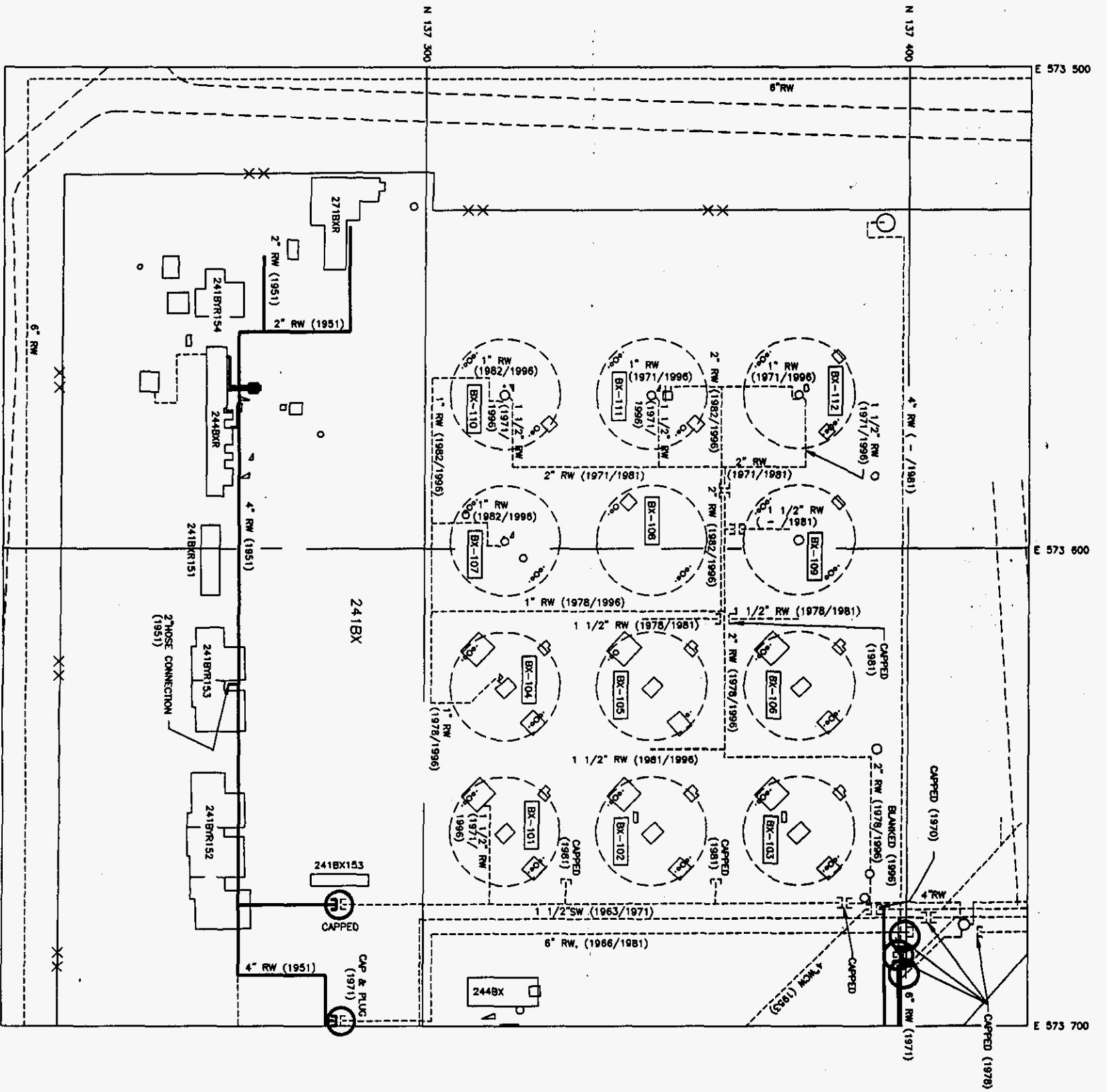
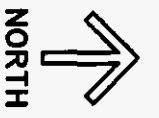
REF. NO.	TITLE
H-2-42463	PIPING AREA OUTSIDE LINES SH4
H-2-42462	PIPING AREA OUTSIDE LINES SH3
H-2-41975	PIPING AREA OUTSIDE LINES SH1
H-2-36535	SAN & RW MAP 200 EAST AREA
H-2-36473	SALT WELL PLOT PLAN & DET
H-2-36335	PIPING LINES IN 241-B-100, 101 & 112
H-2-36334	PIPING LINES IN 241-B-100, 101 & 112
H-2-36332	PIPING PLOT PLAN 241-B TANK FARM
H-2-2021	GENERAL LINES FIRST CYCLE

REF. NO.	TITLE
H-2-70881	PIPING & BOTM PLAN 241-B TANK FARM
H-2-70880	PIPING & BOTM PLAN 241-B TANK FARM
H-2-70881	EMERG F. DIA SALT WELL SYS
H-2-70824	PIPING CONTROLLED RW 241-B TANK FARM
H-2-44501-140	AREA MAP 200 EAST BY PLANT FAC
H-2-44501-138	AREA MAP 200 EAST BY PLANT FAC
H-2-44501-128	AREA MAP 200 EAST BY PLANT FAC
H-2-44501-126	AREA MAP 200 EAST BY PLANT FAC
H-2-44500	PLANT FACILITIES

REF. NO.	TITLE
H-2-73283	PIPING WASTE TR. ISLN 241-B-105
H-2-73282	PIPING WASTE TR. ISLN 241-B-104
H-2-73281	PIPING WASTE TR. ISLN 241-B-103
H-2-73280	PIPING WASTE TR. ISLN 241-B-102
H-2-73279	PIPING WASTE TR. ISLN 241-B-101
H-2-73278	PIPING WASTE TR. ISLN 241-B-100
H-2-73277	PIPING WASTE TR. ISLN 241-B-101 DET
H-2-73276	PIPING WASTE TR. ISLN 241-B-101
H-2-73275	PIPING WASTE TR. ISLN 241-B-100

REF. NO.	TITLE
H-2-73284	PIPING WASTE TR. ISLN 241-B-106
H-2-73283	PIPING WASTE TR. ISLN 241-B-105
H-2-73282	PIPING WASTE TR. ISLN 241-B-104
H-2-73281	PIPING WASTE TR. ISLN 241-B-103
H-2-73280	PIPING WASTE TR. ISLN 241-B-102
H-2-73279	PIPING WASTE TR. ISLN 241-B-101
H-2-73278	PIPING WASTE TR. ISLN 241-B-100

REF. NO.	TITLE
H-2-73284	PIPING WASTE TR. ISLN 241-B-106
H-2-73283	PIPING WASTE TR. ISLN 241-B-105
H-2-73282	PIPING WASTE TR. ISLN 241-B-104
H-2-73281	PIPING WASTE TR. ISLN 241-B-103
H-2-73280	PIPING WASTE TR. ISLN 241-B-102
H-2-73279	PIPING WASTE TR. ISLN 241-B-101
H-2-73278	PIPING WASTE TR. ISLN 241-B-100



241-BX TANK FARM

REF. NUMBER	TITLE	REF. NUMBER	TITLE
H-14-100960	CIVIL TR. FARM COMPOSITE	H-2-73313	PIPELINE WASTE TR. SECT 241-BX-111
H-2-73862	PIPELINE PLAN W/PIPE & MAN HOLES	H-2-73273	PIPELINE WASTE TR. SECT 241-BX-110
H-2-73320	PIPELINE WASTE TR. SECT 241-BX-112	H-2-70989	PIPELINE WASTE TR. SECT 241-BX-109
H-2-73319	PIPELINE WASTE TR. SECT 241-BX-109	H-2-70981	ENGINEERING PLAN 241-BX TR. FARM
H-2-73318	PIPELINE WASTE TR. SECT 241-BX-107	H-2-70981	ENGINEERING PLAN 241-BX TR. FARM
H-2-73317	PIPELINE WASTE TR. SECT 241-BX-106	H-2-70982	ENGINEERING PLAN 241-BX TR. FARM
H-2-73315	PIPELINE WASTE TR. SECT 241-BX-104	H-2-63402	ENGINEERING PLAN 241-BX TR. FARM
H-2-73314	PIPELINE WASTE TR. SECT 241-BX-103	H-2-44501	ENGINEERING PLAN 241-BX TR. FARM

DWG NO.	TITLE	DWG NO.	TITLE
H-2-42463	PIPELINE AMOUNT OUTSIDE THE LINES SHOWN	H-2-42462	PIPELINE AMOUNT OUTSIDE THE LINES SHOWN
H-2-42462	PIPELINE AMOUNT OUTSIDE THE LINES SHOWN	H-2-41975	PIPELINE AMOUNT OUTSIDE THE LINES SHOWN
H-2-41975	PIPELINE AMOUNT OUTSIDE THE LINES SHOWN	H-2-38535	SOIL & FILL MAP 200 EAST AREA
H-2-38535	SOIL & FILL MAP 200 EAST AREA	H-2-38533	PIPELINE RIGHT PLAN 241-BX TR. FARM
H-2-38533	PIPELINE RIGHT PLAN 241-BX TR. FARM	H-2-38532	PIPELINE LEFT PLAN 241-BX TR. FARM
H-2-38532	PIPELINE LEFT PLAN 241-BX TR. FARM	H-2-38530	PIPELINE RIGHT PLAN 241-BX TR. FARM
H-2-38530	PIPELINE RIGHT PLAN 241-BX TR. FARM	H-2-38529	PIPELINE LEFT PLAN 241-BX TR. FARM
H-2-38529	PIPELINE LEFT PLAN 241-BX TR. FARM	H-2-610	GENERAL LAYOUT 241-BX

LEGEND:

- WATER LINE (ACTIVE)
- - - WATER LINE (ABANDONED)
- *—*—* FENCE
- 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.

METRIC

U.S. DEPARTMENT OF ENERGY
 CIVIL / ENVIR
 WATER LINES
 241-BX TANK FARM

ES-050051-C2.0

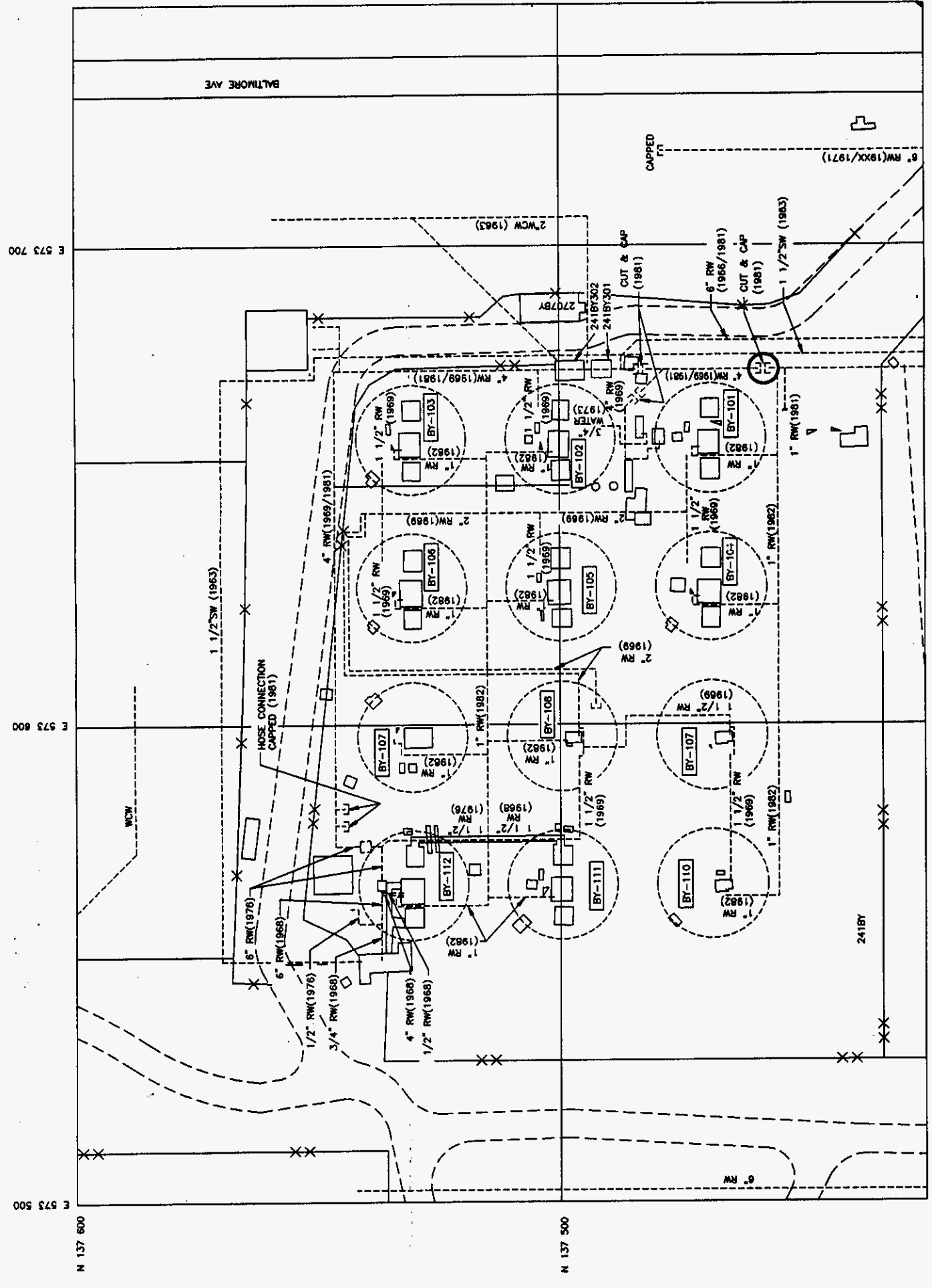


LEGEND:

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

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.



241-BY TANK FARM

REF NUMBER	TITLE	REFERENCES	DWG NO	TITLE	REFERENCES
H-2-73247	PIPING WASTE TR. S&M 241-BY-105	H-2-37112	112-BY TK. ARREST "AS-BUILT"		
H-2-73248	PIPING WASTE TR. S&M 241-BY-103	H-2-37111	111-BY TK. ARREST "AS-BUILT"		
H-2-73244	PIPING WASTE TR. S&M 241-BY-102	H-2-37110	110-BY TK. ARREST "AS-BUILT"		
H-2-70857	PIPING & M&M PLUM 241-BY TR. FARM	H-2-37109	109-BY TK. ARREST "AS-BUILT"		
H-2-70856	PIPING & M&M PLUM 241-BY TR. FARM	H-2-37108	108-BY TK. ARREST "AS-BUILT"		
H-2-70851	ENGRG FL. DIA. S&M WELL SYS.	H-2-37107	107-BY TK. ARREST "AS-BUILT"		
H-2-70828	PIPING CONTROLLED WTR. 241-BY TR. FARM	H-2-37106	106-BY TK. ARREST "AS-BUILT"		
H-2-62451	US&M WTR. S&M TR. FARM	H-2-37105	105-BY TK. ARREST "AS-BUILT"		
H-2-44501-151	AREA MAP 200 EAST TR. PLANT EACH	H-2-37104	104-BY TK. ARREST "AS-BUILT"		
H-2-44501-140	AREA MAP 200 EAST TR. PLANT EACH	H-2-37103	103-BY TK. ARREST "AS-BUILT"		
H-2-42453	PIPING WASTE TR. S&M 241-BY-108	H-2-37102	102-BY TK. ARREST "AS-BUILT"		
H-2-42452	PIPING WASTE TR. S&M 241-BY-107	H-2-37101	101-BY TK. ARREST "AS-BUILT"		
H-2-41975	PIPING WASTE TR. S&M 241-BY-106	H-2-36960	TK 241-BY-106 ISOLATION		
H-2-73246	PIPING WASTE TR. S&M 241-BY-104				
H-2-73245	PIPING WASTE TR. S&M 241-BY-103				
H-2-73243	PIPING WASTE TR. S&M 241-BY-101 & 105				
H-2-34800	TKS 107 & 110 BY ADD TO L.I.S.S.				
H-2-34302	TKS 108 & 109 BY ADD TO L.I.S.S.				
H-2-33479	US&M CHANGING S&M S&M PROMOTIVE				
H-2-33477	ENGRG FL. DIA. & DWG INDEX				
H-2-33057	PLUM & M&M PLUM & S&M TR. FARM				
H-2-32283	AREA MAP 200 EAST TR. PLANT EACH				
H-2-32266	US&M WTR. S&M TR. FARM				
H-2-32262	US&M WTR. S&M TR. FARM				
H-2-1505	PLUM WASTE TR. S&M TR. FARM				

METRIC	NAME	DATE
	W.L. CROWLEY, JR.	

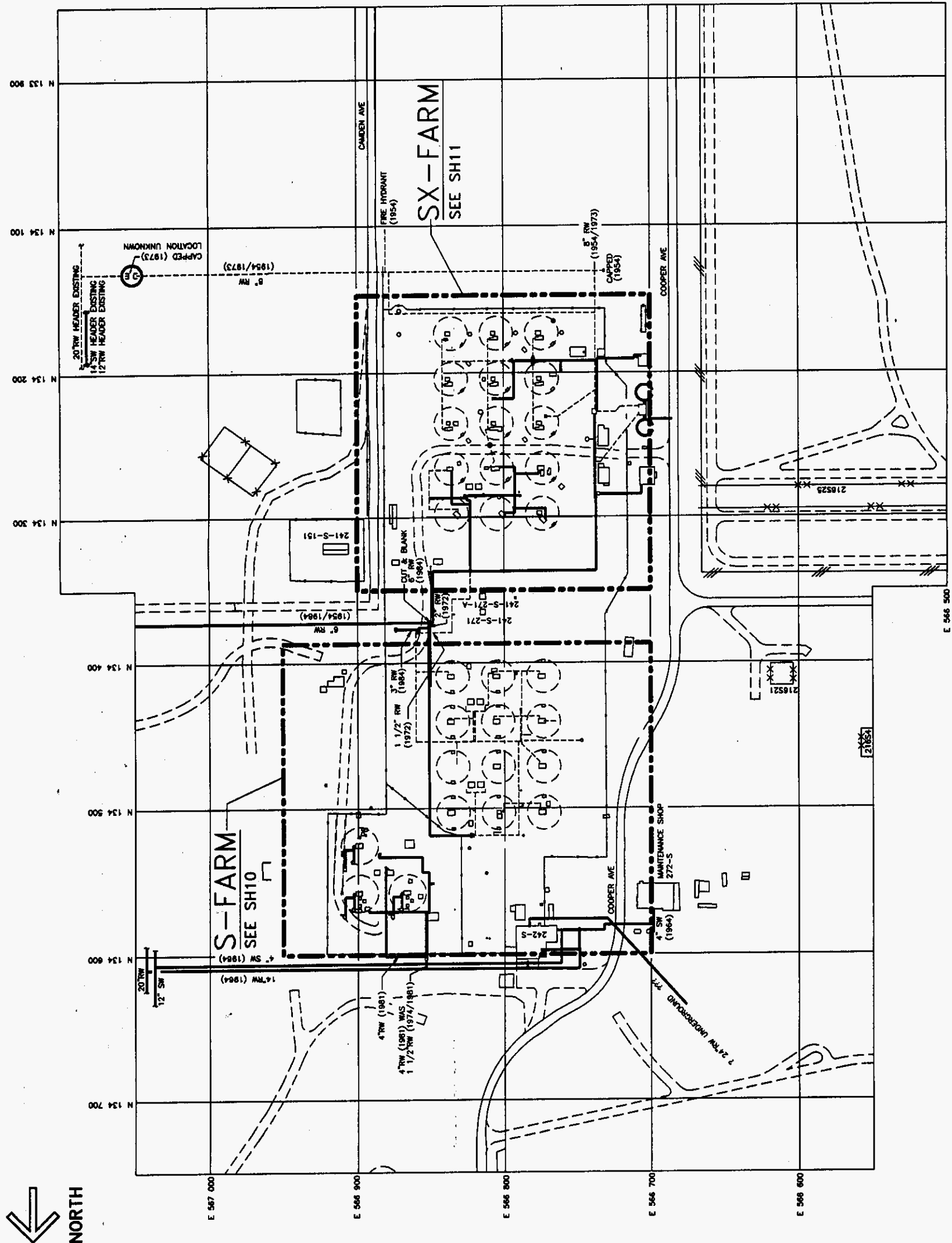
U.S. DEPARTMENT OF ENERGY
Federal Operations Office
CIVIL / ENVIR
WATER LINES
241-BY TANK FARM
ES-050051-C2.0

- LEGEND:**
- WATER LINE (ACTIVE)
 - - - WATER LINE (ABANDONED)
 - - - FENCE
 - >---> LAMBERT COORDINATES (METERS)
 - E 574 000 (DATE)
 - (DATE/DATE) INSTALLATION/ABANDONED DATE
 - ☐ TANK NUMBER
 - POTHOLE

METRIC

NAME	W.L. CROWLEY, JR.
DATE	1984
SCALE	
PROJECT NO.	ES-050051-C2.0
DATE	
BY	
CHECKED	
APPROVED	

U.S. DEPARTMENT OF ENERGY
Civil / ENVIR
WATER LINES
241-S TANK FARM



241-S TANK FARMS

DWG NO	TITLE	REFERENCES	REV	DATE	BY	CHKD	APPD

LEGEND:

○ POTHOLE

□ TANK NUMBER

— (DATE) INSTALLATION/ABANDONED DATE

— (DATE) INSTALLATION DATE

— E 574 000 LAMBERT COORDINATES (METERS)

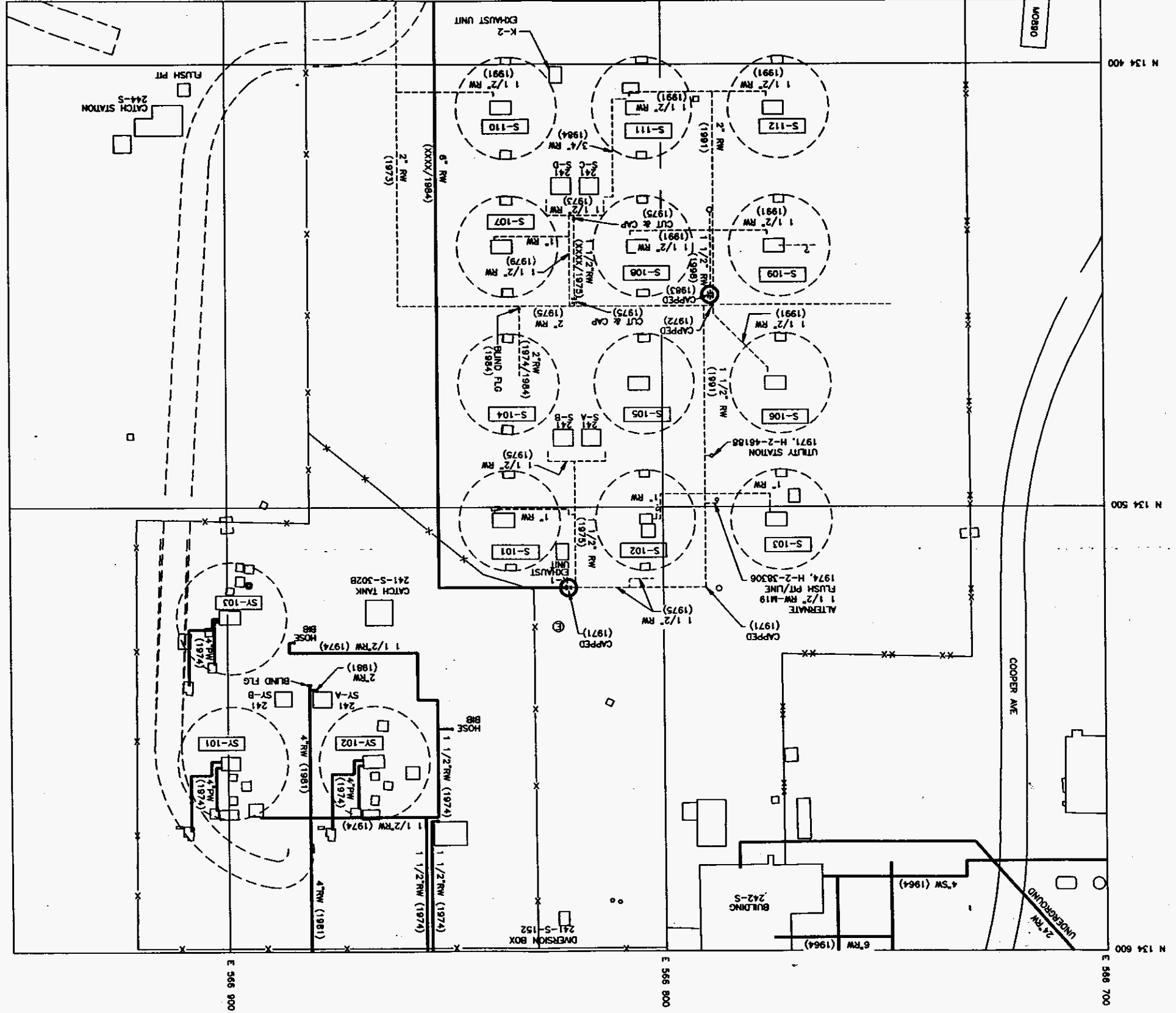
— FENCE

— WATER LINE (ACTIVE)

— WATER LINE (ABANDONED)

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.



241-S TANK FARMS

REVISIONS

REV. NO.	DATE	DESCRIPTION
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REFERENCES

REF. NO.	TITLE
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PROJECT INFORMATION

U.S. DEPARTMENT OF ENERGY
 National Operations Office
 CIVIL / ENVIR
 WATER LINES
 241-S TANK FARM
 ES-050051-C2.0

ES-050051-C2.0

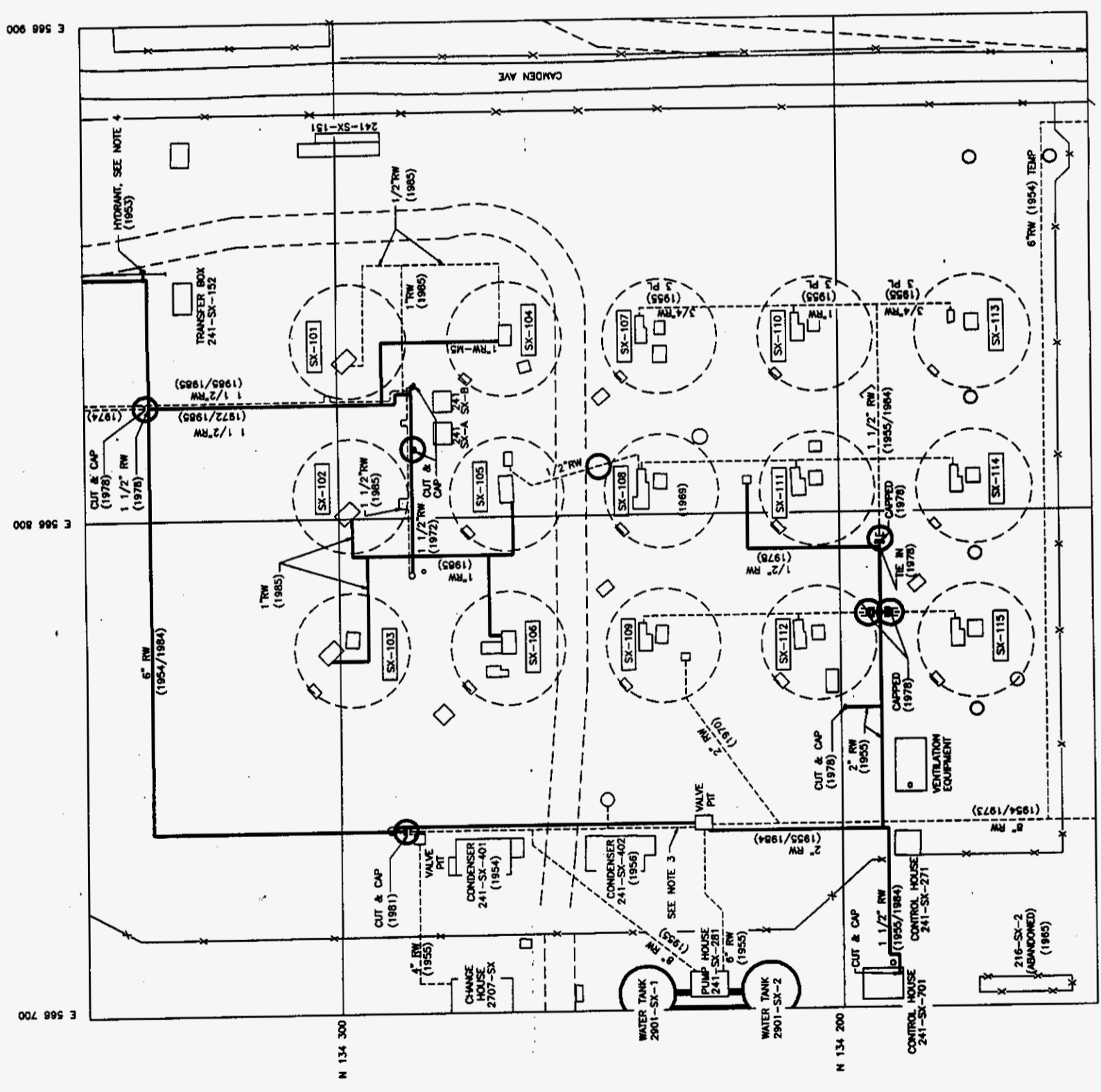
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LEGEND:

- WATER LINE (ACTIVE)
- - - - WATER LINE (ABANDONED)
- - - - FENCE
- **--- LAMBERT COORDINATES (METERS)
- **--- E 574 000
- **--- (DATE)
- **--- (DATE/DATE)
- **--- TANK NUMBER
- POT HOLE

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)
4. FLOW TEST AT FIRE HYDRANT TO VERIFY ACTIVE LINE.



241-SX TANK FARM

REFERENCES

REF NUMBER	TITLE
H-2-33845	FORMER PLAN 241-SX TANK FARM, TR. 104-106
H-2-33844	FORMER PLAN 241-SX TANK FARM, TR. 101-103
H-2-33842	ENGINEERING DRAWING 241-SX TANK FARM
H-2-33841	PIPING CONTROLLED WITH 241-SX TANK FARM
H-2-73206	PIPE LINE TO FIRE PUMP FROM TANK FARM
H-2-46341	PIPE LINE FROM TANK FARM TO FIRE PUMP
H-2-46340	PIPING PLAN 241-SX TANK FARM TO FIRE PUMP
H-2-46192	PIPING PLAN 241-SX TANK FARM TO 241-SX TANK
H-2-44811-30	AREA MAP 200 WEST 'S' PLANT FACIL.
H-2-44811-30	AREA MAP 200 WEST 'S' PLANT FACIL.
H-2-39952	8" LIFT CONDENSERS PLOT PLAN & OUTSIDE LINES
H-2-39950	ENGINE WITH PUMP HOSE & CHANGE HOUSE

QUANTITY LIST

DWG NO.	TITLE
ES-050051-C2	SHP

REFERENCES

REF NUMBER	TITLE
H-2-39904	241-SX-402 COND. PUMP PLAN & PIPING
H-2-39901	TR. 107-115 WAREHOUSE FACIL.
H-2-39879	PIPE LINE FROM TANK FARM TO FIRE PUMP
H-2-39874	PIPE COILED COND. ASSEMBLY
H-2-39861	GEN. LIT. WASTE DESPL. FACIL.
H-2-39850	PLOT PLAN
H-2-39849	PLOT PLAN

METRIC

NAME	DATE
CR. CROWLEY, JR.	

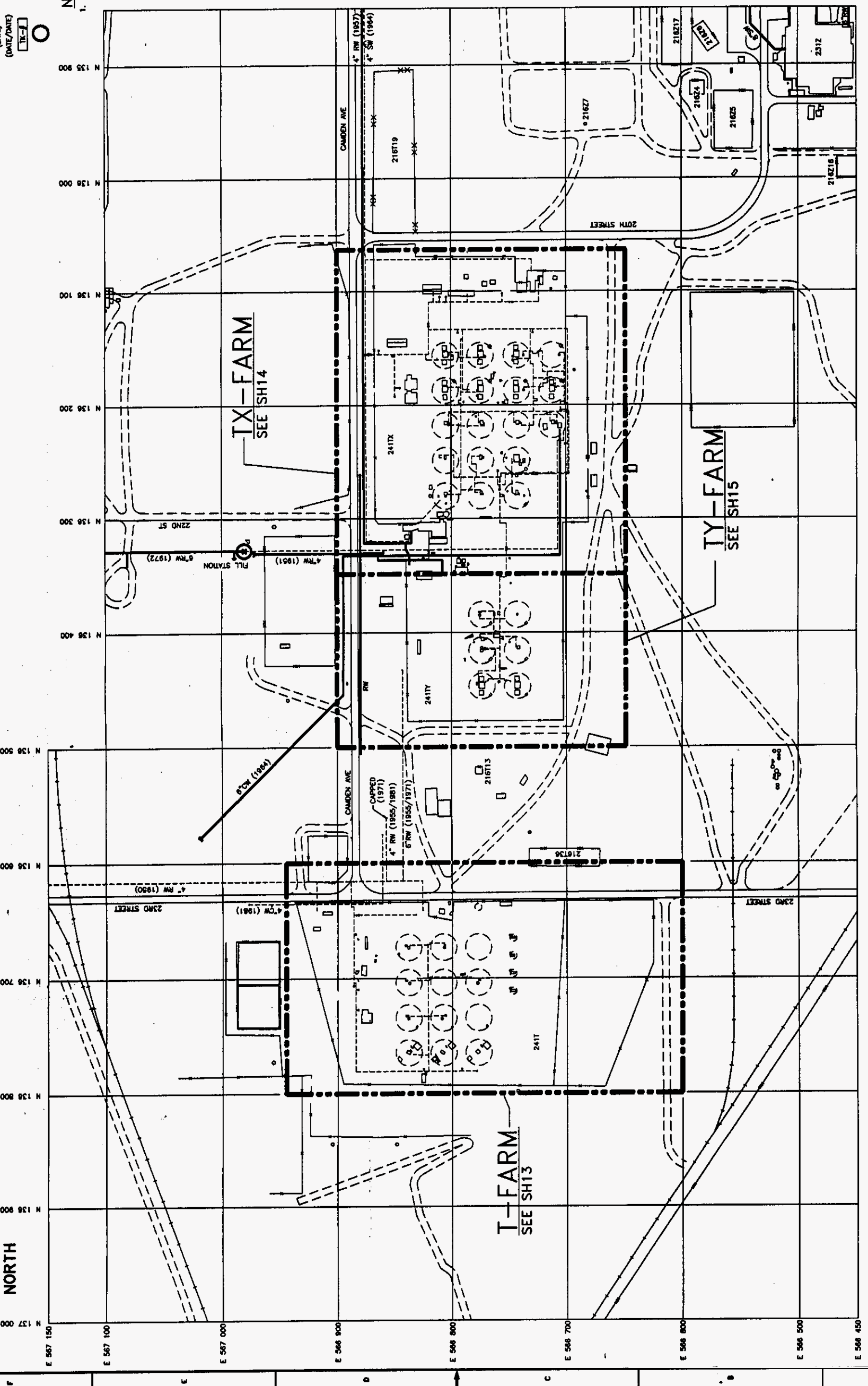
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LEGEND:

- WATER LINE (ACTIVE)
- - - WATER LINE (ABANDONED)
- - - FENCE
- +---+--- LAMBERT COORDINATES (METERS)
- E 574 000
- (DATE)
- (DATE/DATE)
- TANK NUMBER
- POT HOLE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.



241-T TANK FARMS

METRIC	
NAME	DATE
W. G. CROWLEY, JR.	1978

U.S. DEPARTMENT OF ENERGY
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 WATER LINES
 241-T TANK FARMS
 ES-050051-C2.0

U.S. DEPARTMENT OF ENERGY
 Richard Operations Office
 CIVIL/ENVR
 WATER LINES
 241-T TANK FARM

NAME: METRIC
 TITLE: CIVIL/ENVR

REVISIONS

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REFERENCES

REF NUMBER	TITLE
H-2-2222	WASTE DISPOSAL FAC. 200 WEST AREA
H-2-3020	WASTE LINE 241-T & 241-T-1 AREA
H-2-3636	SOIL & RW MAP ZOOM AREA
H-2-4263	ARCH PLOT PLAN, SH#2
H-2-4267	PEPPING ARCHIT OUTSIDE UTIL. LINE
H-2-4431	AREA MAP ZOOM T. PLANT FACIL.
H-2-7043	PEPPING CONTROL WTR 241-T TX FARM
H-2-7302	PEPPING WTR TX ISAL. 241-T-101
H-2-7303	PEPPING PLAN
H-2-7369	DESIGN P. ON 241-T & TX FARM
H-2-7378	PEPPING & WTR PLAN 241-T TX FARM

DWG NO.

TITLE

DATE

SCALE

PROJECT NO.

PROJECT NAME

PROJECT LOCATION

PROJECT DESCRIPTION

PROJECT STATUS

PROJECT OWNER

PROJECT CONTACT

PROJECT ADDRESS

PROJECT PHONE

PROJECT FAX

PROJECT E-MAIL

PROJECT WEBSITE

PROJECT URL

PROJECT IP

PROJECT MAC

PROJECT BSSID

PROJECT SSID

PROJECT CHANNEL

PROJECT RATE

PROJECT BAND

PROJECT POWER

PROJECT ANTENNA

PROJECT POLARIZATION

PROJECT DIVERSITY

PROJECT MIMO

PROJECT S-MIMO

PROJECT MU-MIMO

PROJECT CA-MIMO

PROJECT FD-MIMO

PROJECT SD-MIMO

PROJECT LD-MIMO

PROJECT ND-MIMO

PROJECT ED-MIMO

PROJECT RD-MIMO

PROJECT UD-MIMO

PROJECT CD-MIMO

PROJECT TD-MIMO

PROJECT FD-MIMO

PROJECT SD-MIMO

PROJECT LD-MIMO

PROJECT ND-MIMO

PROJECT ED-MIMO

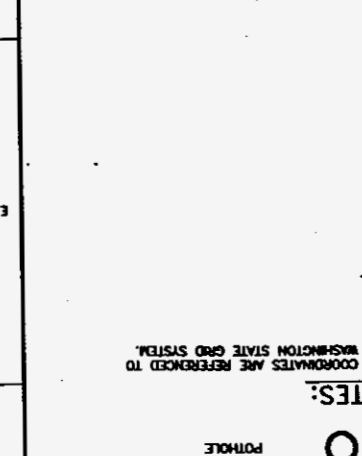
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PROJECT UD-MIMO

PROJECT CD-MIMO

PROJECT TD-MIMO

241-T FARM



LEGEND:

- Water Line (Active)
- Water Line (Abandoned)
- Fence
- Lambert Coordinates (Meters)
- Installation Date (Date)
- Installation/Abandoned Date (Date)
- Tank Number
- Pothole

NOTES:

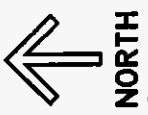
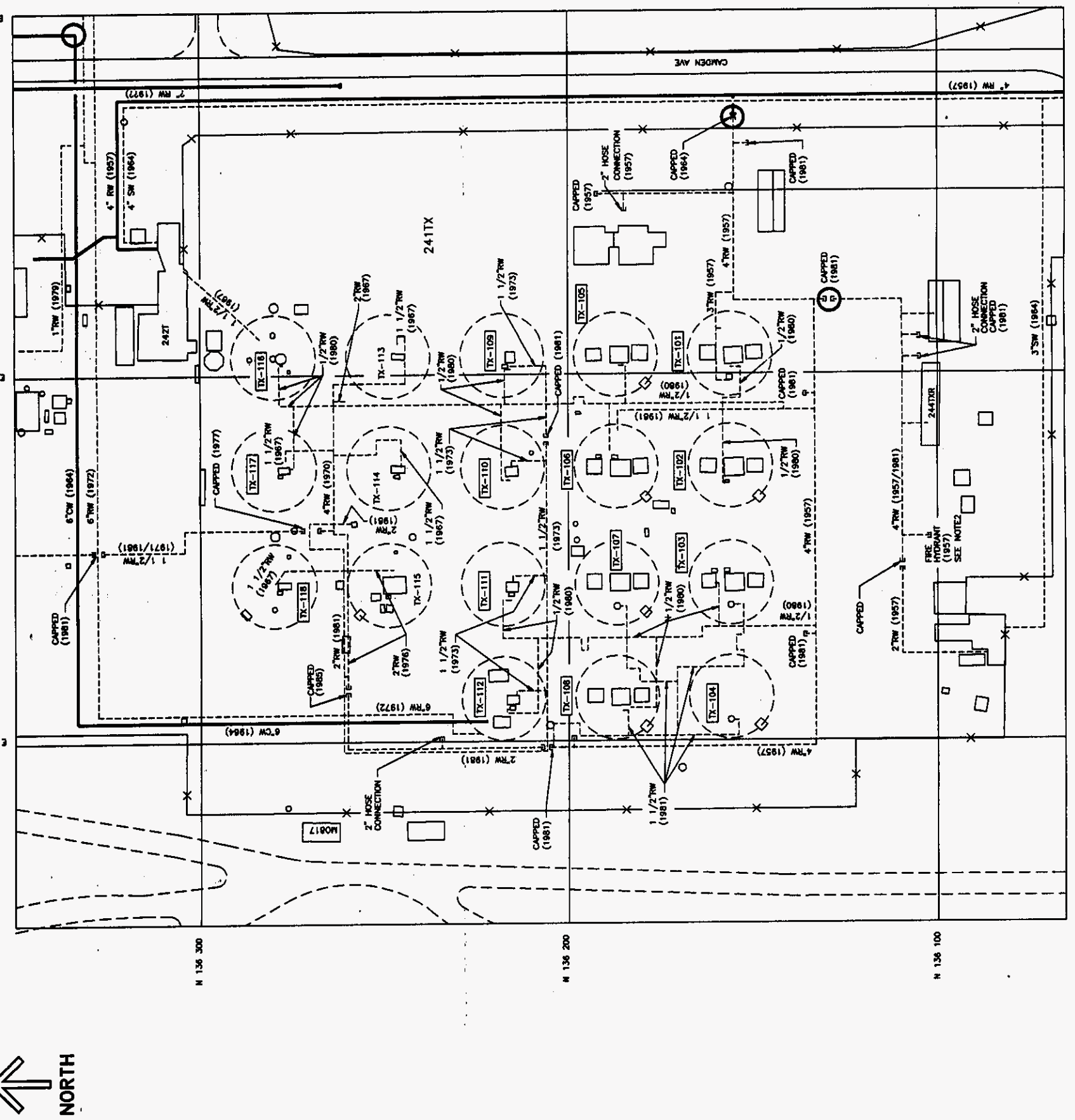
- Coordinates are referenced to Washington State Grid System.

LEGEND:

- WATER LINE (ACTIVE)
- - - WATER LINE (ABANDONED)
- - - - FENCE
- E 574 000 LAMBERT COORDINATES (METERS)
- (DATE) INSTALLATION DATE
- (DATE/DATE) INSTALLATION/ABANDONED DATE
- TX-# TANK NUMBER
- POT HOLE

NOTES:

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



U.S. DEPARTMENT OF ENERGY			
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WATER LINES			
241-TX TANK FARM			
ES-050051-C2.0			

METRIC	NAME	NO.	DATE	BY	DESCRIPTION

REF NUMBER	TITLE	REFERENCE
H-2-36311	PIPING PLAN 241-TX TANK FARM	
H-2-36309	BASE FLOOR PLAN 241-TX TANK FARM	
H-2-36308	ENGINEERING PLAN 241-TX TANK FARM	
H-2-34991	ENGINEERING PLAN 241-TX TANK FARM	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	

REF NUMBER	TITLE	REFERENCE
H-2-70840	WTR SUPPLY LINE PLAN & DET	
H-2-46511-178	PIPE & BASE PLAN & DET 241-TX FARM	
H-2-46511-118	AREA MAP ZONE 241-TX FARM	
H-2-42070	PIPING PLAN 241-TX TANK FARM	
H-2-36336	PLAN & RW MAP ZONE 241-TX FARM	
H-2-36314	PIPE PLAN & DET 241-TX FARM	
H-2-36311	PIPING PLAN 241-TX TANK FARM	

REF NUMBER	TITLE	REFERENCE
H-2-36311	PIPING PLAN 241-TX TANK FARM	
H-2-36309	BASE FLOOR PLAN 241-TX TANK FARM	
H-2-36308	ENGINEERING PLAN 241-TX TANK FARM	
H-2-34991	ENGINEERING PLAN 241-TX TANK FARM	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	

REF NUMBER	TITLE	REFERENCE
H-2-36311	PIPING PLAN 241-TX TANK FARM	
H-2-36309	BASE FLOOR PLAN 241-TX TANK FARM	
H-2-36308	ENGINEERING PLAN 241-TX TANK FARM	
H-2-34991	ENGINEERING PLAN 241-TX TANK FARM	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	
H-2-22923	PIPE FACE, TEMP. & PIPING PLAN	

REF. NUMBER	TITLE
H-2-97702	AREA MAP & SEWM W/ BORNH SECT
H-2-97701	AREA MAP & SEWM W/ BORNH SECT
H-2-73112	AREA MAP & SEWM W/ BORNH SECT
H-2-70857	AREA MAP & SEWM W/ BORNH SECT
H-2-70856	AREA MAP & SEWM W/ BORNH SECT
H-2-70854	AREA MAP & SEWM W/ BORNH SECT
H-2-70853	AREA MAP & SEWM W/ BORNH SECT
H-2-44511-118	AREA MAP & SEWM W/ BORNH SECT
H-2-44511-110	AREA MAP & SEWM W/ BORNH SECT
H-2-42070	AREA MAP & SEWM W/ BORNH SECT
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H-2-36633	AREA MAP & SEWM W/ BORNH SECT

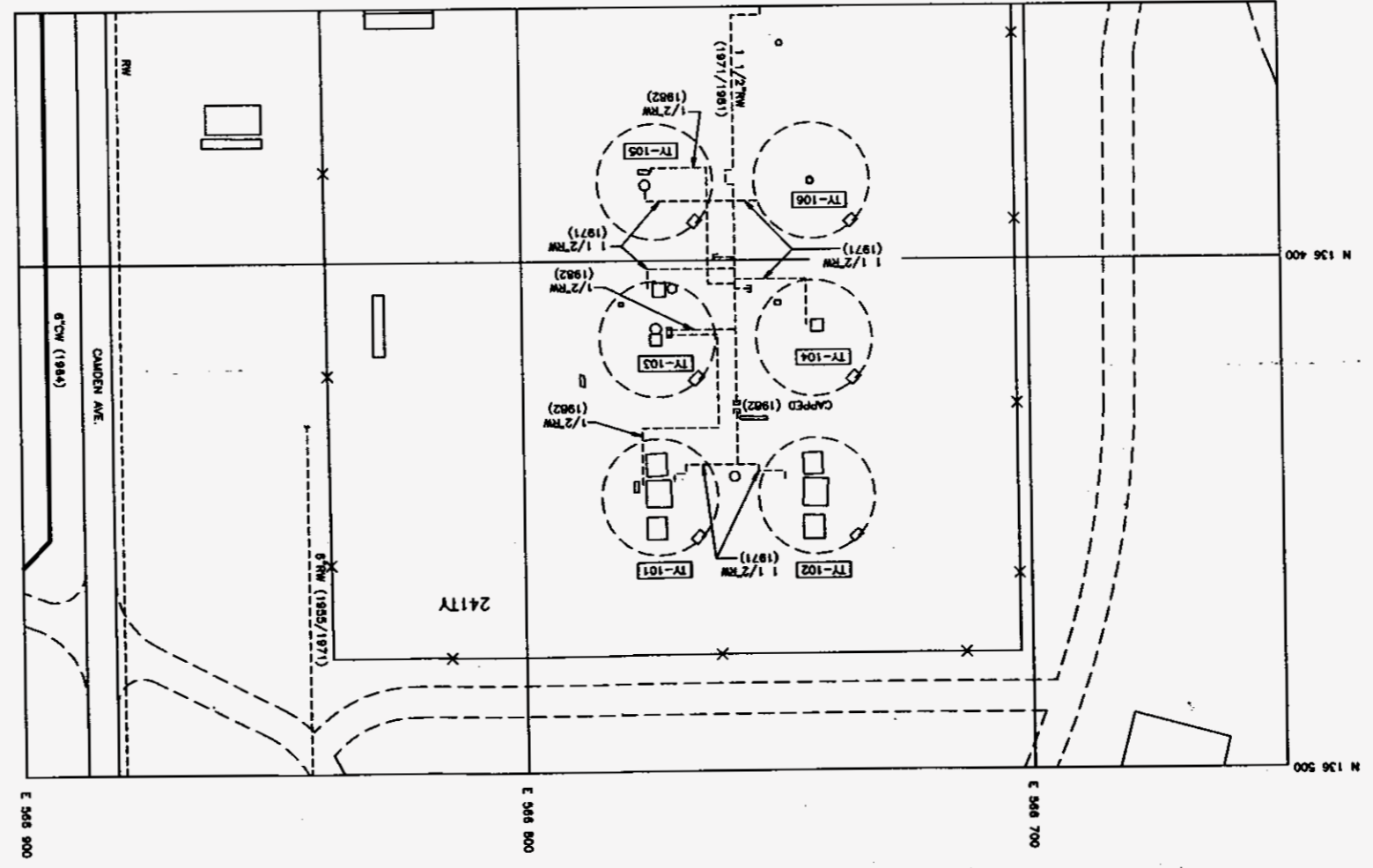
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H-2-36602	AREA MAP & SEWM W/ BORNH SECT
H-2-36601	AREA MAP & SEWM W/ BORNH SECT
H-2-36536	AREA MAP & SEWM W/ BORNH SECT
H-2-36513	AREA MAP & SEWM W/ BORNH SECT
H-2-36510	AREA MAP & SEWM W/ BORNH SECT
H-2-36507	AREA MAP & SEWM W/ BORNH SECT
H-2-36506	AREA MAP & SEWM W/ BORNH SECT
H-2-36505	AREA MAP & SEWM W/ BORNH SECT
H-2-36504	AREA MAP & SEWM W/ BORNH SECT
H-2-36503	AREA MAP & SEWM W/ BORNH SECT
H-2-36502	AREA MAP & SEWM W/ BORNH SECT
H-2-36451	AREA MAP & SEWM W/ BORNH SECT

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U.S. DEPARTMENT OF ENERGY
 METRIC
 NAME: JH. CROWLEY JR.
 TITLE: Regional Operations Office

CIVIL/ENVR
 WATER LINES
 241-TY TANK FARM
 ES-050051-C2.0

241-TY FARM

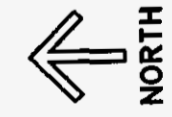


NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

LEGEND:

- WATER LINE (ACTIVE)
- - - - - WATER LINE (ABANDONED)
- X-X- FENCE
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- (DATE) INSTALLATION DATE
- (DATE/DATE) INSTALLATION/ABANDONED DATE
- TANK NUMBER

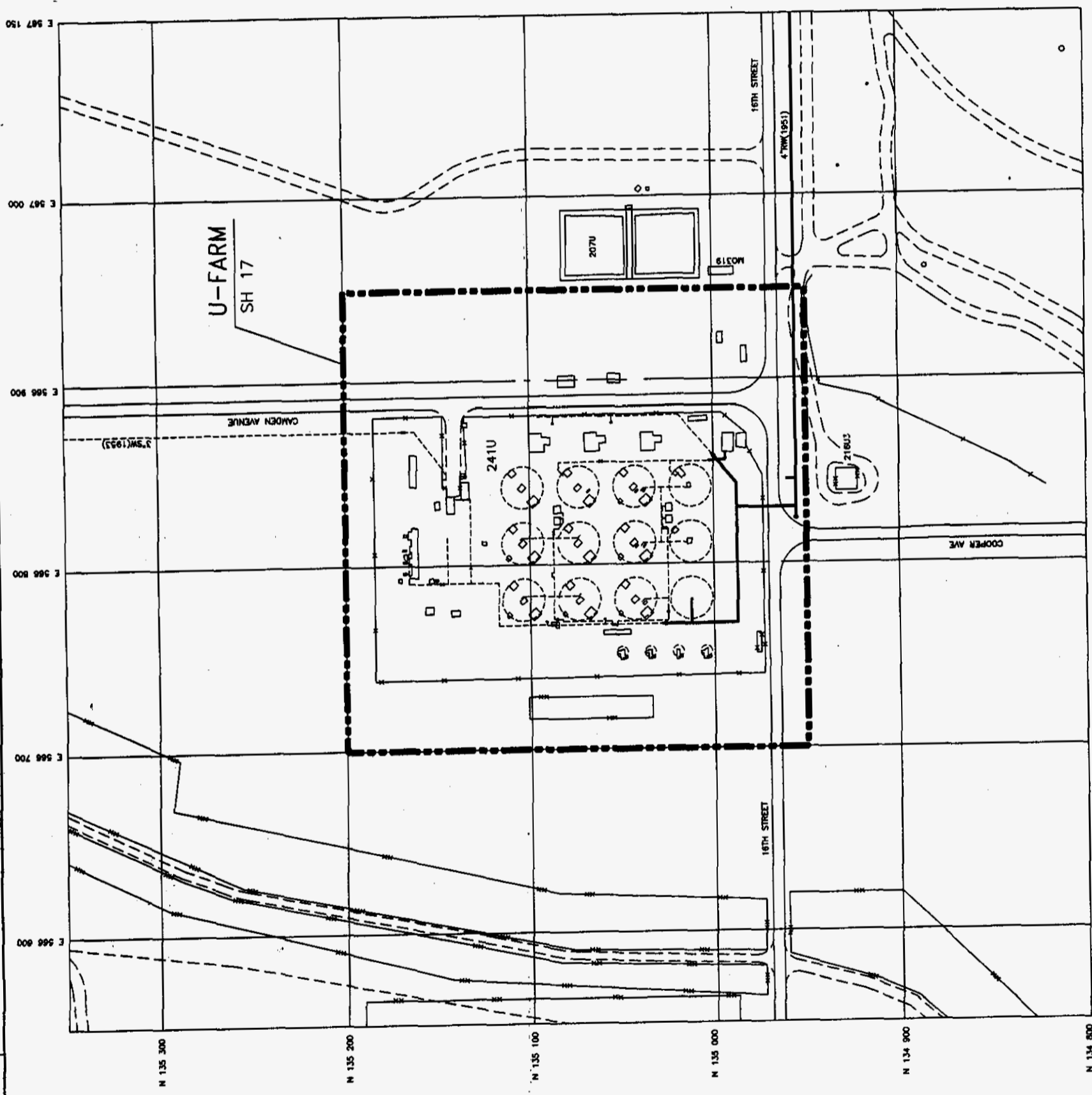


LEGEND:

- WATER LINE (ACTIVE)
- WATER LINE (ABANDONED)
- - - - - FENCE
- x - x - LAMBERT COORDINATES (METERS)
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- x - x - INSTALLATION DATE
- x - x - (DATE/DATE)
- x - x - INSTALLATION/ABANDONED DATE

NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.



241-U FARM

REF NUMBER	TITLE	DATE
H-2-24004	200W AREA WIR LINE PLANT PLAN	1951
H-2-40285	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-37344	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-37343	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-37048	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-36825	SALT WELL WIR LINE TX 112-U	1951
H-2-36826	SWM & RW MAP 200W AREA	1951
H-2-24001	200W AREA WIR LINE PLANT PLAN	1951

REF NUMBER	TITLE	DATE
H-2-97702	200W AREA WIR LINE PLANT PLAN	1951
H-2-49451	PERM CORRIDOR WIR LINE TX FARM	1951
H-2-37017	PERM PLAN & SECTIONS	1951
H-2-37308	PERM & RW MAP TX FARM	1951
H-2-37309	PERM & RW MAP TX FARM	1951
H-2-37310	PERM & RW MAP TX FARM	1951
H-2-37311	PERM & RW MAP TX FARM	1951
H-2-48311-79	AREA MAP 200W TX FARM	1951
H-2-48311-80	AREA MAP 200W TX FARM	1951

REF NUMBER	TITLE	DATE
H-2-24004	200W AREA WIR LINE PLANT PLAN	1951
H-2-40285	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-37344	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-37343	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-37048	PERM AREA OF URGENT WIR LINE SWI	1951
H-2-36825	SALT WELL WIR LINE TX 112-U	1951
H-2-36826	SWM & RW MAP 200W AREA	1951
H-2-24001	200W AREA WIR LINE PLANT PLAN	1951

NAME	DATE
DR. COBBLET, JR.	1951

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 WATER LINES
 241-U TANK FARM
 ES-050051-C2.0

WATER LINE (ACTIVE)
 WATER LINE (ABANDONED)
 FENCE
 LAMBERT COORDINATES (METERS)
 E 574 000
 INSTALLATION DATE
 (DATE)
 INSTALLATION/ABANDONED DATE
 TANK NUMBER
 POT HOLE

NOTES:
 1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

U.S. DEPARTMENT OF ENERGY
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 WATER LINES
 241-U TANK FARM
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W. COBBLEY, JR.	

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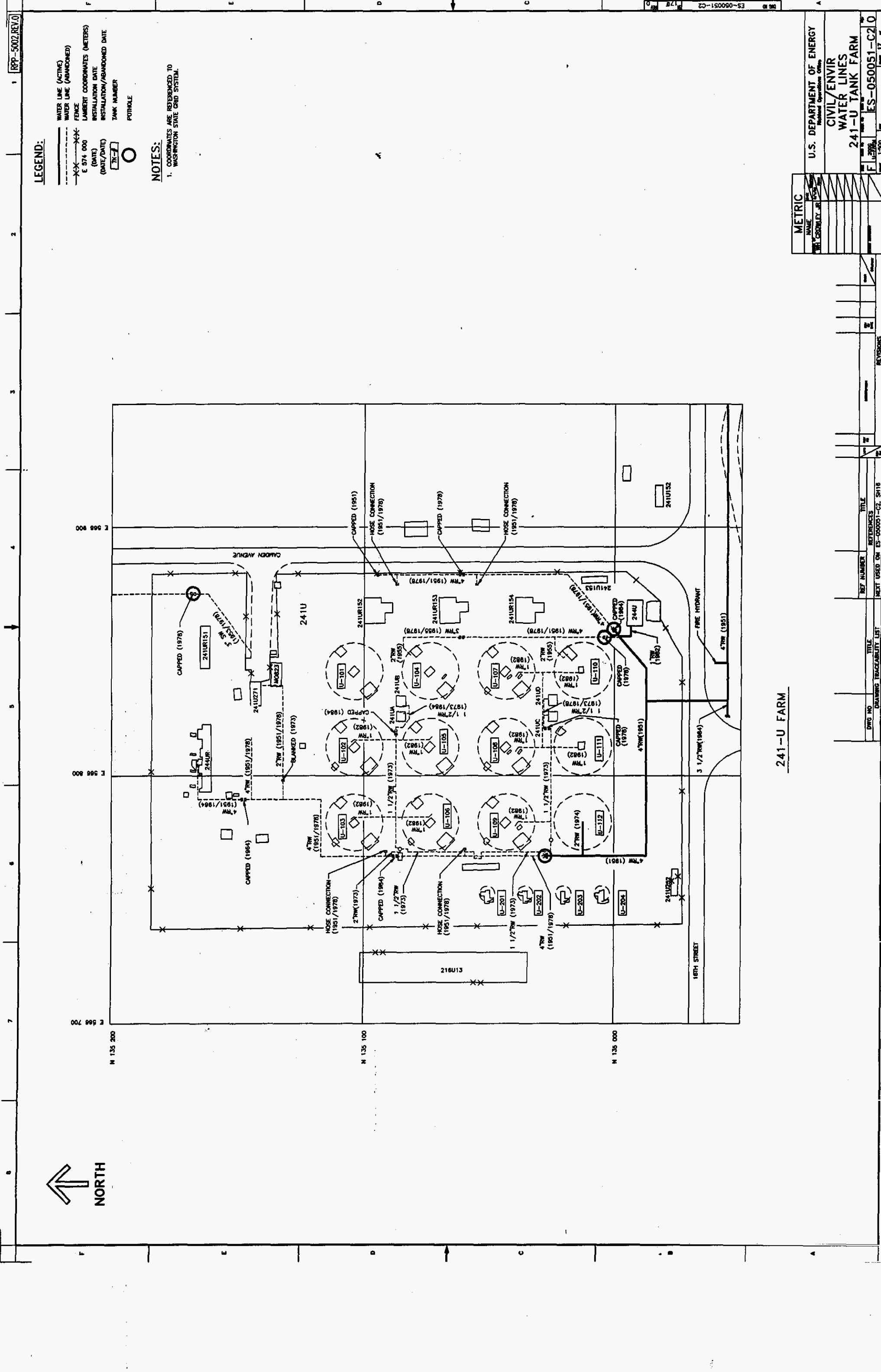
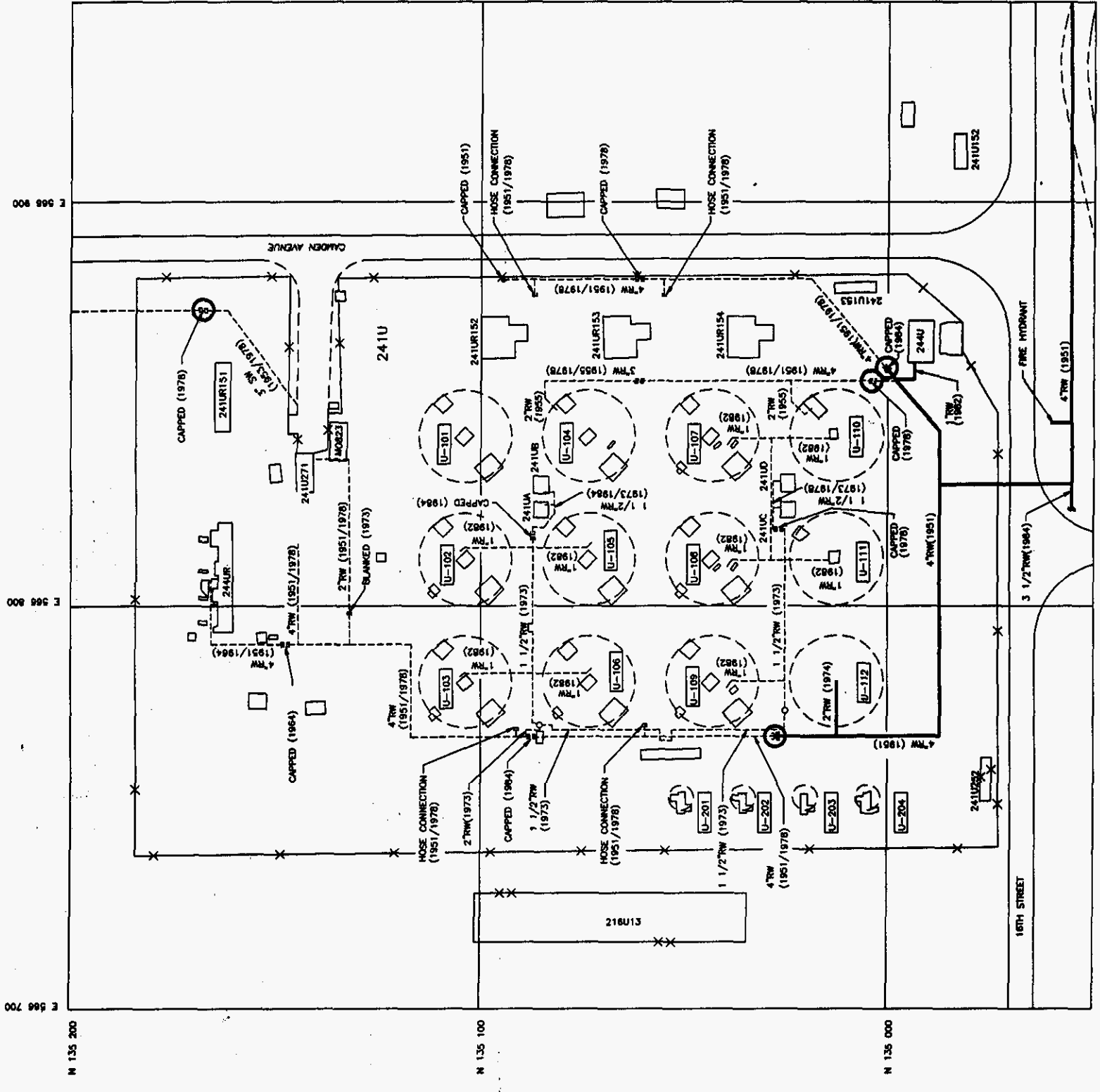
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241-U FARM



ATTACHMENT I
WELL ASSESSMENT

ENGINEERING STUDY

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

October 1999

Subcontract LMHC 96WO-0006

Prepared by

Fluor Daniel Northwest
Richland, Washington

Prepared for

Lockheed Martin Hanford Corporation

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APPENDICES

Appendix A. WELL DESCRIPTION

Appendix B. WELL PRIORITIES BY FARM

Appendix C. VADOSE ZONE WELLS - SOIL SAMPLE DEPTH AND PITT

Appendix D. DECISION MATRIX AND CRITERIA

Appendix E. COST ESTIMATES

Appendix F. INDEX - VADOSE ZONE CHARACTERIZATION REPORTS

Appendix G. GROUNDWATER WELLS AND VADOSE ZONE WELLS - LISTING

Appendix H. ENGINEERING SKETCHES

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 have contributed to contamination of the soil above, around, and below the SSTs. 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 action to essentially reduce water and contamination migration through the vadose zone, the zone between groundwater and the soil surface. These combined studies support TPA milestone P (M)-45-56-T01, as created by change request M-45-98-03.



Figure 1, HANFORD SITE MAP

2.0 SUMMARY AND CONCLUSIONS

This engineering study assesses 838 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 14 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.

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. Twelve wells are already decommissioned per WAC 173-160 and require no further action. Priority 1 (55 wells) are groundwater wells and some vadose or abandoned 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 located in high risk locations. Priority 2 (62 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 second priority for decommissioning. Priority 3 (709 wells) are vadose zone wells around the SSTs that also present a high risk to the groundwater, but 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 to be taken is to request a variance with 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 state regulations. Specific steps for to 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 5.2.2.2). This method has been used on the Hanford Site and it 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 use in vadose zone testing, i.e., soil sampling or for 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, therefore, all the SST farms except T Tank Farm have a large number of available wells. 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 in each well are identified in the tables in Appendix C.

The estimated cost to decommission a groundwater well is approximately \$25,000, and the cost to decommission a vadose zone well is approximately \$19,000. Each well would take an estimated 2 days (2 shifts) 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 tank 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 size, length, and configuration of the casings, varying from well to well depending on the

referenced document. Various approaches were used to determine the appropriate number, size, depth, and configuration of the wells, 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 838 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 the implementation.

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 10.3.

3.3 SITE VISITS AND INTERVIEWS

Each SST farm was observed to understand the orientation of the tanks and wells. Numerous Lockheed Martin Hanford Corporation (LMHC) 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 (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 from LMHC included Jim Adrian, Ken Drakulich, Kevin Hull, Lee Dougherty, Rebecca Raven, Dan Niebuhr, and Dave Barns. 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, wells used in the RCRA monitoring of the groundwater; 12-in. dry storage holes in west tank farms; the use of vadose zone wells for leak detection of the SSTs, and monitoring of contamination migration. John Reeves from E2 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 defined the "Webster Completion" as a process where construction 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 lite-gauge metal casing while other wells may have a double casing. The lite-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 LMHC 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 well that had received the Webster Completion, but this report could not be located. None of the SST farm wells meet Washington State well criteria, WAC-173-160 (state requirements). 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 allowed 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, i.e., 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.

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. Refer to Appendix A for details.

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

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

Assumptions used for this study include:

- 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 wells are not included in the scope 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 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.

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.

- DOE Order 5480.28 *Natural Phenomena Hazards Mitigation*
- DOE Order 5820.2A *Radioactive Waste Management*
- HNF-PRO-097 *Engineering Design and Evaluation*
- WAC 173-303-640 *Dangerous Waste Regulations, Tank Systems*
- WHC-IP-1043 *WHC Occupational ALARA Program*
- WHC-SD-GN-DGS-30011 *Radiological Design Guide*
- WHC-CM-4-46 *Safety Classification of Structures, Systems, and Components*
- HNF-SD-WM-BIO-001 *Basis for Interim Operations*
- WAC 173-160 *Well Construction and Decommissioning*

3.5.3 REQUIREMENTS

The following requirements apply to all remedial actions associated with the well assessment.

- The final recommendations of this study should 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 (WHC 1996a) and HNF-IP-1266, Chapters 5 and 6.
- Maintenance and operations activities associated with any of the alternatives should be minimized or eliminated.

4.0 WELL DESCRIPTIONS

4.1 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 14 configurations for the tank farm wells. These configurations vary in casing size, the number and different sized casings, double casings, surface grouting, perforations, etc. The configuration and description of each well type are included in Appendix A.

4.2 FITNESS FOR USE AND DECOMMISSIONING PRIORITY

4.2.1 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). 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 boundary. Therefore, any groundwater wells within the farm are no longer needed or required, and no longer fit-for-use. Well 299-E33-41 is outside the 241-BX SST farm fence.

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. 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. 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. 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.

4.2.2 Decommissioning Priority

Considering the many variations in the configurations and conditions, various types 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.

4.2.2.1 Wells Currently Decommissioned, No Action Required – Twelve 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.

4.2.2.2 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 are in immediate proximity to the tanks that have been drilled, capped approximately 1-ft below the ground surface, and buried.

A third type of wells is 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 55 Priority 1 wells.

4.2.2.3 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 62 Priority 2 wells.

4.2.2.4 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 709 Priority 3 wells.

5.0 ALTERNATIVES CONSIDERED

Alternatives considered for decommissioning the wells are described below.

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 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 ALTERNATIVE 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 alternative methods of well decommissioning will be evaluated.

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 in. 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.

5.2.2.1 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. For the decommissioning process, the total depth of the casing needs to be perforated. Following mechanical perforating, the well would be pressure grouted.

5.2.2.2 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 field 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 proportion of the casing can be perforated at a 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.

5.2.2.3 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 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 farm began with the initial construction of the B, C, T, and U Tank Farms in the early 1940's and continued through the present. The majority of the monitoring wells were installed in the late 1960's and through the 1970's. 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.

5.3.1 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 of 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, most of the casing heads are buried with plastic valve boxes providing access. Alternative 3 would install a watertight manhole over all existing well casing. 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, a 6-in. concrete pad, and well number identification (see Figure 5.1).

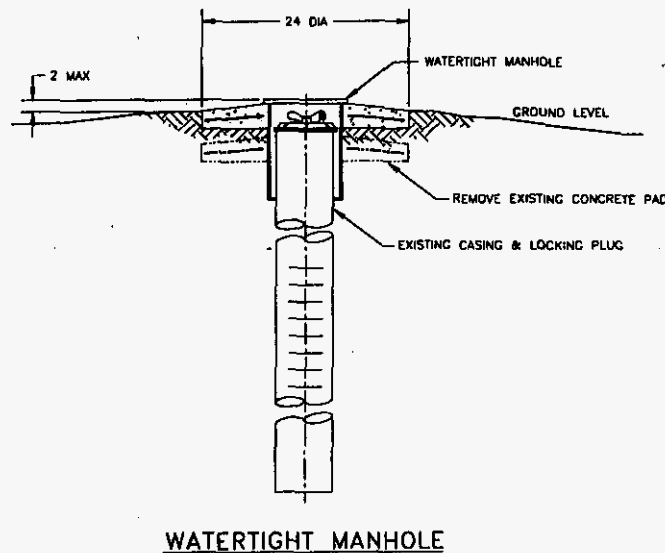


Figure 5.1

5.3.2 Seek a Well Variance from Washington Department of Ecology

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) $\frac{1}{4}$, $\frac{1}{4}$, 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 (55 Priority 1 and 62 Priority 2 wells). There are 709 Priority 3 wells that would not be decommissioned until after the tank farm is 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 some of the wells
- Controlled access to all tank farms
- Database in Appendix G

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 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.

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, a list of the decision criteria, a weight factor table, and an impact table.

6.2 ADVANTAGES AND DISADVANTAGES

Table II-6.2-1 provides a comparison of advantages and disadvantages of the well assessment alternatives.

Table II-6.2-1

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: \$6.4M*	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: \$2.3M*	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: \$1.5M*	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	Requires grout injection
	Perforate any length casing and multiple casings at once	
2d. Cut, Remove, and Perforate Estimated cost: \$3.4M*	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: \$1.7M (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	

*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 for 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 perceived natural phenomena hazards or risks associated with this alternative.

6.4 COST AND SCHEDULE INFORMATION

Detailed cost estimates and schedules for the alternatives are in Appendix E. Costs are prepared for each SST farm priority and alternative considered. These cost 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 Table II-E-5 and Tables 6 and 7 in Appendix E.

There are 12 wells that have been decommissioned and no future costs are projected. The 55 deep wells in Priority 1 are identified as first priority for decommissioning and include groundwater wells and undefined abandoned wells. The costs for these wells are separated by farm (Table II-E-1).

The 62 wells identified in Priority 2 are second priority for decommissioning. They are outlying vadose zone wells greater than 50 ft from the outside of the tanks, and therefore contamination migration monitoring 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 709 vadose zone wells included in Priority 3 are tabulated by SST farm in Table II-E-3.

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 farm. 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 838 wells that have been reviewed by type and divided by priority. Twelve wells previously decommissioned in accordance with WAC 173-160 require no further action. Priority 1 includes 55 wells that extend to the groundwater and that have been abandoned or are located adjacent to the cribs. Priority 2 consists of 62 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 709 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 5.2.2.2).

The third phase includes decommissioning the vadose zone wells following waste retrieval from the SSTs. The preferred alternative for decommissioning Priority 3 wells is also Alternative 2c (Section 5.2.2.2). Current technology makes the jet shot method the safest, fastest, and most cost-effective method.

The basis for the preferred alternative selection is the decision matrix in conjunction with the advantages, disadvantages, principal hazards and risks, and costs. The decision matrix comparing the alternatives, based on predefined criteria was developed for each alternative and each tank farm, as shown in Appendix D. Weight factors for each decision criterion and impact factor, and defining how well an alternative satisfied the criteria established the method for selection. The weight and impact factors were totaled and the results provided a total weighted score for each alternative. A review of the matrix and the total weighted score indicates that decommissioning the wells, utilizing Alternative 2c, is the preferred alternative of those reviewed.

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 CHANGES TO IMPLEMENT PREFERRED ALTERNATIVE

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

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

9.0 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.

9.1 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.

9.2 PARTITIONING INTER-WELL TRACER TESTING

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.

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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 been installed through the present day.
1954	SX	1970	B, BX, BY, C, S, SX, TX		
1955	A	1971	B, BX, BY, S, SX, TX, TY		
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).

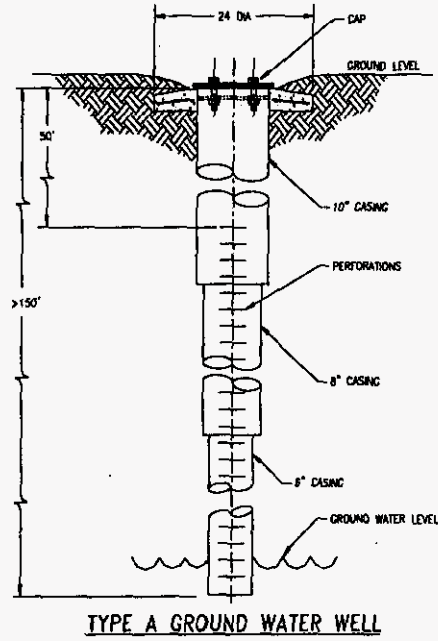


Figure 1

1.1.2 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).

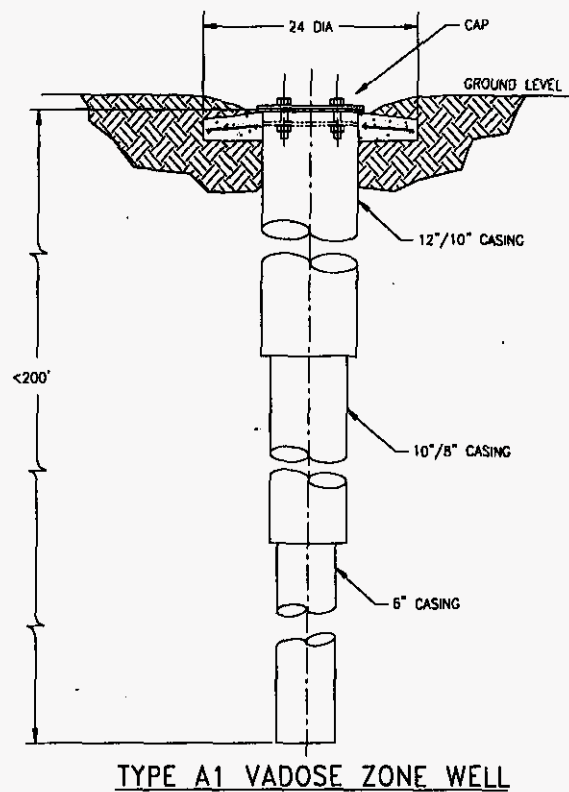


Figure 2

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).

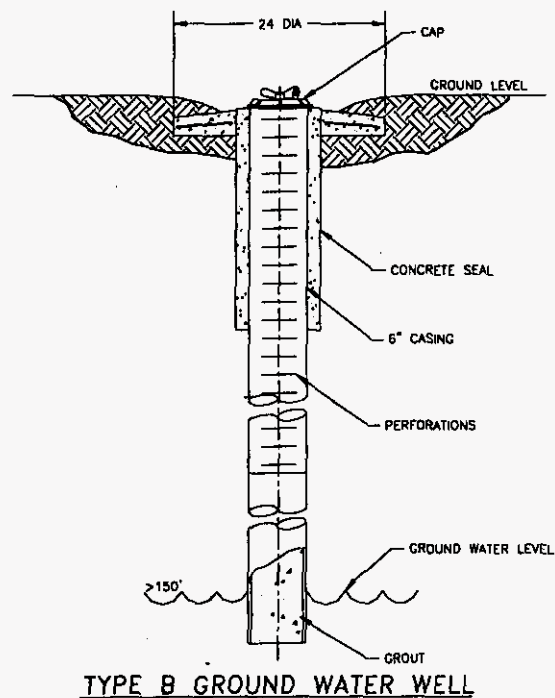


Figure 3

1.1.4 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).

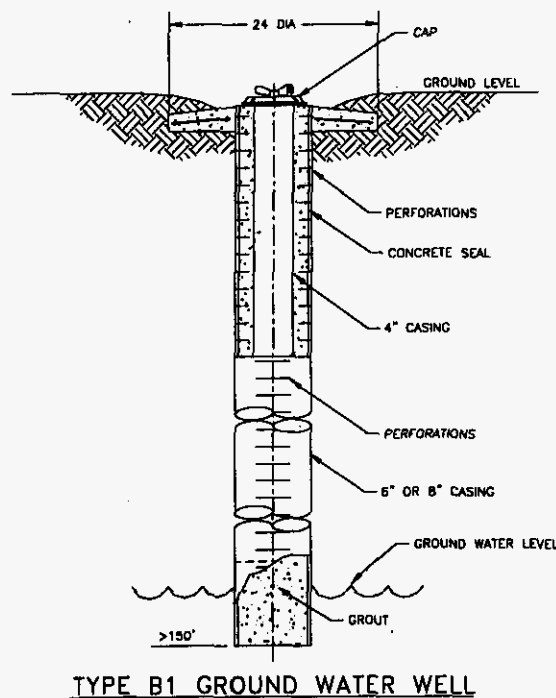


Figure 4

1.2 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).

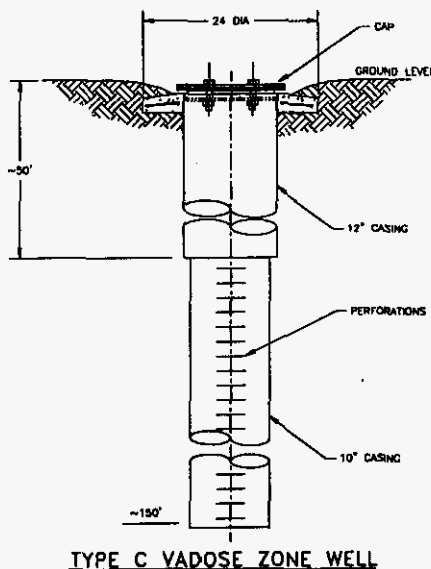


Figure 5

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).

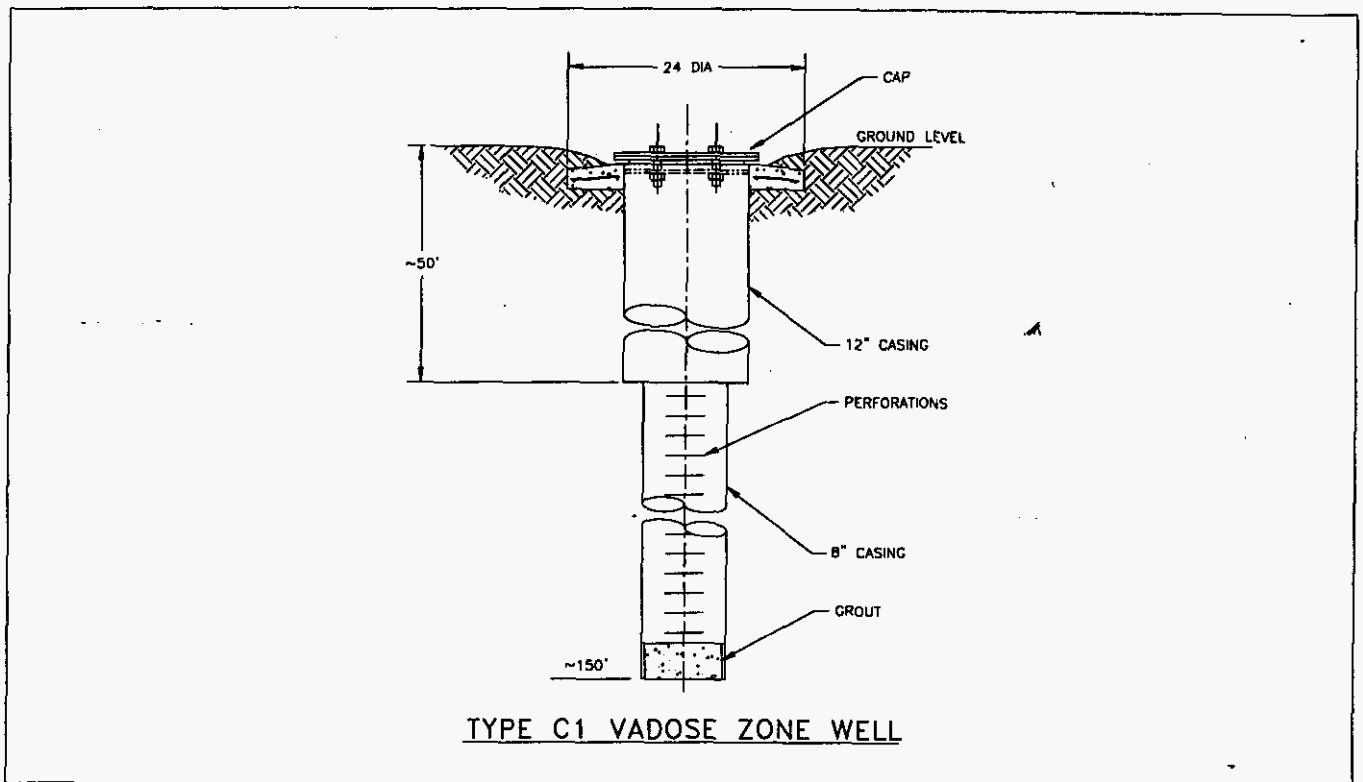
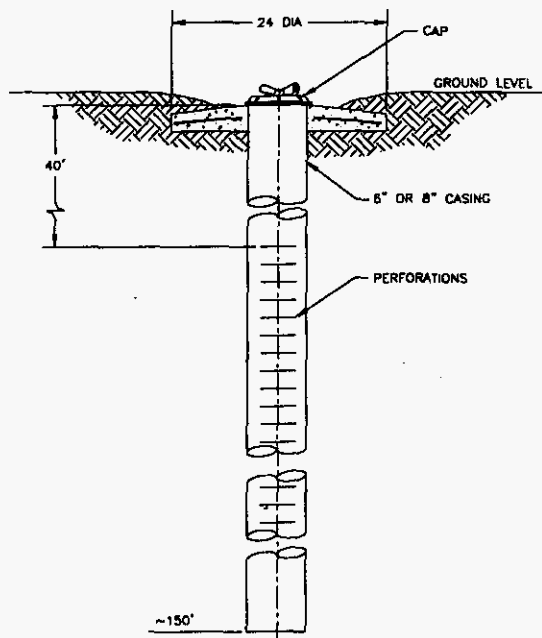


Figure 6

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

1.2.4 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).

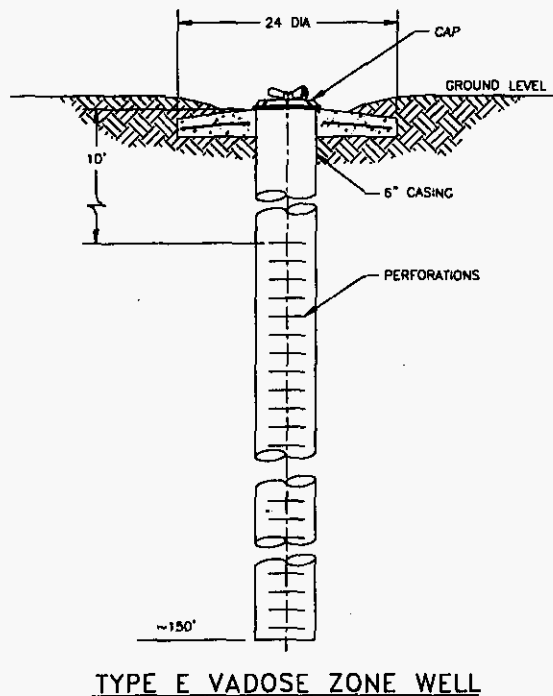


Figure 8

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).

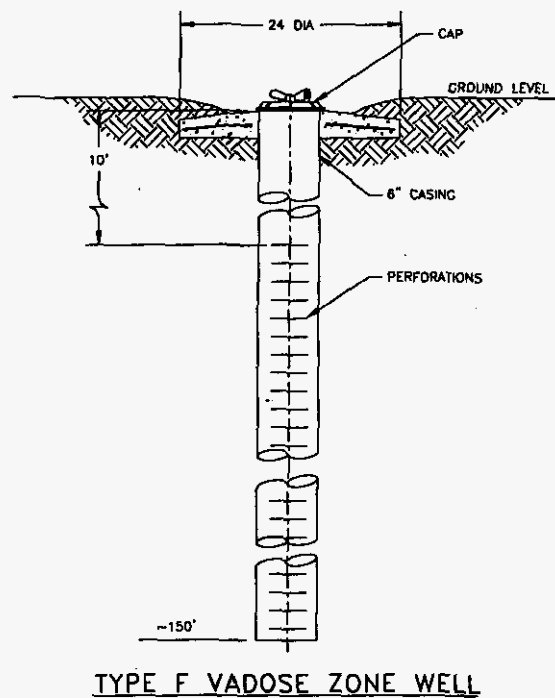


Figure 9

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).

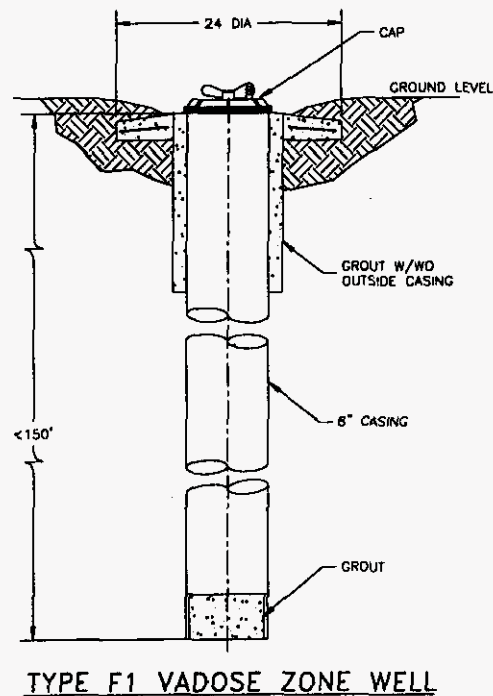
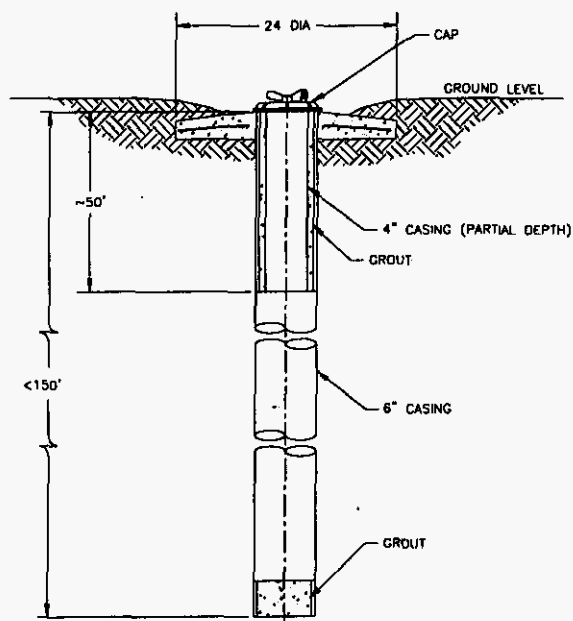


Figure 10

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).

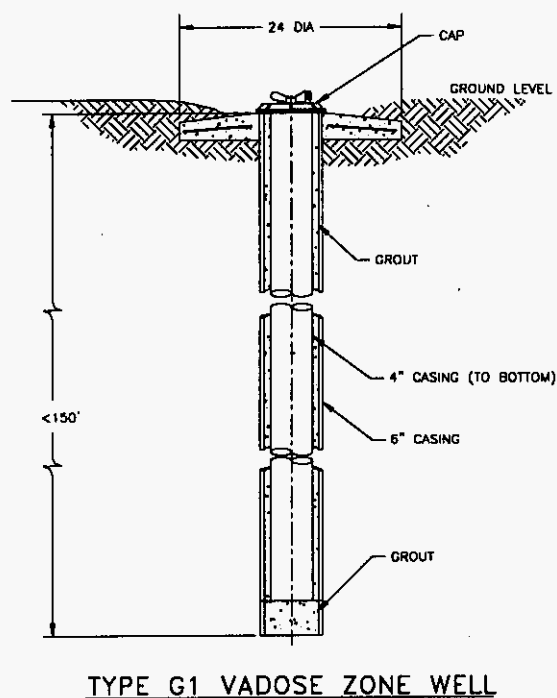
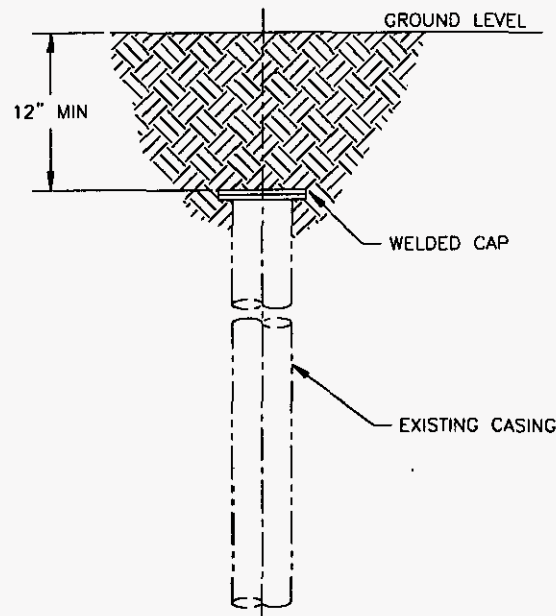


Figure 12

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.

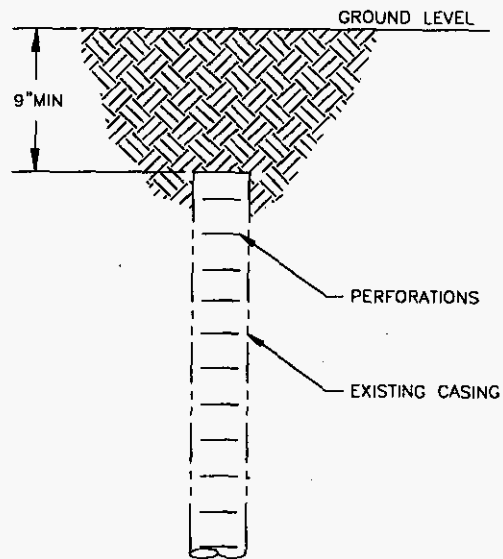
- 1.3.1 **TYPE "H" Well** – An H Type well includes all wells identified in the available documentation as abandoned. These wells have been cut off approximately 12-in. below ground level and a welded cap installed (see figure 13).



TYPE H ABANDONED WELL

Figure 13

1.3.2 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 14).



TYPE I DECOMMISSIONED WELL

Figure 14

APPENDIX B

WIBL PRIORITY SERVICE PLAN

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
Total Type B1 Wells =		4	Length =	1351		
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
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

241 - A - FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
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
10-05-09	299-E25-062	A6501	6	125	4/24/62	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
Total Monitoring Wells =		47	Length =		5221	
Total Farm Wells =		53	Length =		6873	

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 B1 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 =		7	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 =		52	Length =		4936.3	

241 - B- FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
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	140	2/1/72	F
20-06-06	299-E33-191	A6999	6	125	3/1/72	F
20-07-02	299-E33-212	A7019	6	100	8/22/73	F
20-07-05	299-E33-149	A6957	6	135	4/14/70	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
20-08-05	299-E33-194	A7002	6	100	3/15/72	F
20-08-07	299-E33-195	A7003	6	103	3/17/72	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

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	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
20-10-24	299-E33-273	A7073	6	24	5/22/75	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 =		40	Length =		4,337	
Total Farm Wells =		48	Length =		5,252	

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
Total # type I Decommissioned W		1	Length =	30		
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
Total # type H Abandoned Wells =		2	Length =	28		
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
21-00-03	299-E33-140	A6948	6	100	5/27/70	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 =	2,135		
PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL						
E33-41	299-E33-041	A4867	4*6	254	NA	B
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 monitoring program.						
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
21-02-04	299-E33-027	A4851	6	265	7/23/70	G1

241 - BX - FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
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
21-10-11	299-E33-170	A6978	6	100	9/17/71	F

241 - BX - FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
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-E33-277	A7076	6	100	4/12/77	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 =		61	Length =		6,325	
Total Farm Wells =		82	Length =		8,772	

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 B2 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	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	
	NA	299-W23-229	A8055	NA	60	07/01/77	F
Total Outlying Wells =		4	Length =		355		
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	

241 - SX - FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
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	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

241 - SX - FARM WELLS						
WELL NUMBER			Dia.	Depth	DATE	TYPE
FARM #	SITE #	STATE #	in.	ft.	Installed	
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
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		105	Length =		11,058	

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	A1
50-00-08	299-W10-052	A7142	12/10/6	150	10/06/44	A1
50-00-10	299-W10-054	A7144	12/10/6	150	10/14/44	A1
50-00-12	299-W10-053	A7143	12/10/6	151	10/11/44	A1
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	A1

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	A1
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	7/19/73	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
	299-W10-131	A7221	NA	NA	NA	NA
	299-W10-132	A7222	NA	NA	NA	NA
Total Monitoring Wells =		66	Length =		6,787	
Total Farm Wells		95	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	I
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	I
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 PITS

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
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
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

241 - A - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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 =		47		

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
20-06-06	299-E33-191	A6999	F	0-15, 55-100
20-07-02	299-E33-212	A7019	F	35-60, 75-90
20-07-05	299-E33-149	A6957	F	-
20-07-11	299-E33-147	A6955	F	-
20-08-02	299-E33-054	A6862	C	-
20-08-05	299-E33-194	A7002	F	-
20-08-07	299-E33-195	A7003	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
20-10-02	299-E33-213	A7020	F	-
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

241 - B- FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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 monitoring 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
21-07-06	299-E33-222	A7029	F	0-25, 35-40, 55-60, 75-100

241 - BX - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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
22-06-09	299-E33-114	A6922	F	0-10, 15-20
22-06-11	299-E33-250	A7057	F	0-35

241 - BY - FARM WELLS

WELL NUMBER			STATE #	TYPE	SOIL SAMPLE DEPTH (ft)
FARM #	SITE #				
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 DEC COMMISSIONING 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
30-07-02	299-E27-088	A6713	F	0-30
30-07-05	299-E27-089	A6714	F	0-5, 45-65

241 - C - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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
40-07-06	299-W23-161	A7997	F	0-5
40-07-08	299-W23-186	A8022	F	0-10, 25-30

241 - S - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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				
FARM #	WELL NUMBER	TYPE	SOIL SAMPLE	
SITE #	STATE #		DEPTH (ft - in)	
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
41-06-11	299-W23-058	A7894	E	0-10, 30-50, 65-95
41-06-23	299-W23-227	A8054	F	0-15

PRIORITY 3 DECOMMISSIONING FOLLOWING RETRIEVAL

241 - SX - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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
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

241 - SX - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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
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

241 - T - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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	-
51-07-07	299-W15-190	A7488	F	0-30, 50-75
51-07-09	299-W15-134	A7433	F	0-15, 65-100

241 - TX - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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
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

241 - TX - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
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
60-09-07	299-W18-121	A7604	F	0-5
60-09-08	299-W18-122	A7605	F	0-5, 115-120

241 - U - FARM WELLS				
WELL NUMBER			TYPE	SOIL SAMPLE
FARM #	SITE #	STATE #		DEPTH (ft - ft)
60-09-10	299-W18-123	A7606	F	0-5, 85-125
60-10-01	299-W18-100	A7583	F	0-30, 35-40
60-10-02	299-W19-075	A7775	F	0-15
60-10-05	299-W18-104	A7587	F	0-25, 125
60-10-07	299-W18-148	A7631	F	0-50, 55-80, 100-120
60-10-11	299-W18-107	A7590	F	0-15, 95-100
60-11-03	299-W18-102	A7585	F	0-20, 125-130
60-11-05	299-W18-109	A7592	F	0-25, 55-125
60-11-06	299-W18-101	A7584	F	0-15, 125
60-11-07	299-W18-110	A7593	F	0-10, 60-70
60-11-12	299-W18-105	A7588	F	0-5, 55, 95-125
60-12-01	299-W18-113	A7596	F	0-48, 68-84, 96-125
60-12-03	299-W18-103	A7586	F	0-20, 125
60-12-05	299-W18-092	A7575	F	0-15, 40-55, 65-100
60-12-07	299-W18-090	A7573	F	0-20, 25, 40, 55, 65-95
60-12-10	299-W18-091	A7574	F	0-50, 60, 85-100
Total Monitoring Wells =		55		



APPENDIX D

DECISION MATRIX AND CRITERIA

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)	5	N/A	5/25	2/10	2/10	4/20	1/5
		NON-RADIATION RELEASES (4.1.1.2)							
	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

1.0 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.

1.1 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.

1.1.1 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.

1.1.1.1 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.

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

1.1.2 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.

1.1.2.1 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.

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

1.1.2.3 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.

1.1.3 Environmental Safety

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

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

1.1.3.2 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.

1.1.3.3 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?

1.2 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.

1.3 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.

1.3.1 Capital Cost

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

1.3.2 Operating Cost

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

1.3.3 Decontamination and Demolition

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

1.4 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.

1.5 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.

1.6 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.

1.7 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 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.

1.8 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 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 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.

1.9 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?

1.10 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.

1.11 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.

2.0 DECISION MATRIX

Based on the decision criteria, each alternative was evaluated in an effort to establish the most viable option (see page II-D-1).

2.1 WEIGHT FACTOR

The decision criteria have been assigned a weight factor that reflects relative importance to other criteria in the decision making process, see Table 2. The decision matrix provides a list of the decision criteria and the associated weight factors.

Table 2
WEIGHT FACTOR

IMPORTANCE	WEIGHT FACTOR
Low	1
Low/Medium	2
Medium	3
Medium/High	4
High	5

2.2 IMPACT FACTOR

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 3).

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).

Table 3
IMPACT FACTOR

IMPACT	SCORE
None	0
Light	1
Light/Moderate	2
Moderate	3
Moderate/Heavy	4
Heavy	5

2.3 WEIGHTED SCORE

An alternative score multiplied by the relative weight factor determines its weighted score. This weighted score indicates how well the alternative performs. The lower the weighted score, the more favorable the alternative.

**This document was too large to scan
as a single document. It has
been divided into smaller sections.**

Section 2 of 2

Document Information

Document #	RPP-5002	Revision	0
Title	ENGINEERING REPORT SST FARMS INTERIM MEASURES TO LIMIT INFILTRATION THROUGH THE VADOSE ZONE		
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APPENDIX E

COST ESTIMATES

COST SUMMARY TABLES	1
ALTERNATIVE 2a: PULL CASING / GROUT HOLE	8
ALTERNATIVE 2b: PERFORATE CASING & GROUT	32
ALTERNATIVE 2c: PERFORATE CASING WITH JET SHOT & GROUT	65
ALTERNATIVE 2d: CUT & REMOVE INNER CASING, PERFORATE OUTER CASING & GROUT	107
ALTERNATIVE 3a: EXTEND CASING AND GROUT PAD	143

Table II-E-1

**ORDER OF MAGNITUDE - COST SUMMARY
PRIORITY 1 WELLS FOR DECOMMISSIONING**

TANK FARM	NUMBER OF WELLS TO DECOMM.	LF OF WELLS TO DECOMM.	LF OF WELLS DOUBLE CASING	Alt. 2a COST TO REMOVE WELL CASING	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH.	Alt. 2c COST TO PERF CASING W/ JET SHOT	Alt. 2d COST TO REMOVE INNER CASING & MECHANICALLY PERFORATE
A	4	1351	1148	\$994,000	\$361,000	\$218,000	\$852,000
AX	13	1663	0	\$1,223,000	\$448,000	\$300,000	\$448,000
B	0	0	0	\$0	\$0	\$0	\$0
BX	2	28	0	\$21,000	\$7,000	\$5,000	\$7,000
BY	1	275	234	\$202,000	\$74,000	\$46,000	\$174,000
C	0	0	0	\$0	\$0	\$0	\$0
S	3	627	350	\$461,000	\$168,000	\$101,000	\$318,000
SX	6	1213	510	\$892,000	\$325,000	\$206,000	\$543,000
T	24	3100	0	\$2,280,000	\$760,000	\$509,000	\$760,000
TX	0	0	0	\$0	\$0	\$0	\$0
TY	2	461	417	\$339,000	\$125,000	\$79,000	\$302,000
U	0	0	0	\$0	\$0	\$0	\$0
TOTAL	55	8718	2659	\$6,412,000	\$2,268,000	\$1,464,000	\$3,404,000

NOTES:

- 1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE 1.
- 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.	LF OF WELLS DOUBLE CASING	Alt. 2a COST TO REMOVE WELL CASING	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH.	Alt. 2c COST TO PERF CASING W/ JET SHOT	Alt. 2d COST TO REM INNER CASING & MECHANICALLY PERFORATE
A	2	301	0	\$221,000	\$80,000	\$49,000	\$80,000
AX	7	92	0	\$68,000	\$25,000	\$17,000	\$25,000
B	8	915	300	\$673,000	\$235,000	\$152,000	\$366,000
BX	17	2135	0	\$1,571,000	\$568,000	\$359,000	\$568,000
BY	0	0	0	\$0	\$0	\$0	\$0
C	7	684	150	\$503,000	\$183,000	\$117,000	\$247,000
S	2	300	0	\$221,000	\$81,000	\$48,000	\$81,000
SX	4	355	0	\$261,000	\$95,000	\$60,000	\$95,000
T	5	723	601	\$532,000	\$177,000	\$119,000	\$447,000
TX	6	900	0	\$662,000	\$241,000	\$158,000	\$241,000
TY	0	0	0	\$0	\$0	\$0	\$0
U	4	600	200	\$441,000	\$158,000	\$96,000	\$244,000
TOTAL	62	7005	1251	\$5,153,000	\$1,843,000	\$1,175,000	\$2,394,000

NOTES:

1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE 1.

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.	LF OF WELLS DOUBLE CASING	Alt. 2a COST TO REMOVE WELL CASING	Alt. 2b COST TO PERF CASING W/ JET SHOT OR MECH.	Alt. 2c COST TO PERF CASING W/ JET SHOT	Alt. 2d COST TO REM INNER CASING & MECHANICAL PERFORATE	Alt. 3 COST FOR WATERTIGHT MANHOLE
A	47	5221	200	\$3,841,000	\$1,394,000	\$844,000	\$1,479,000	\$113,000
AX	32	3182	0	\$2,341,000	\$857,000	\$575,000	\$857,000	\$86,000
B	40	4337	50	\$3,190,000	\$1,115,000	\$722,000	\$1,137,000	\$97,000
BX	62	6609	265	\$4,862,000	\$1,759,000	\$1,111,000	\$1,873,000	\$150,000
BY	70	7376	50	\$5,426,000	\$1,982,000	\$1,236,000	\$2,003,000	\$167,000
C	63	6645	200	\$4,888,000	\$1,778,000	\$1,132,000	\$1,863,000	\$151,000
S	68	7544	0	\$5,550,000	\$2,026,000	\$1,214,000	\$2,026,000	\$164,000
SX	94	9490	90	\$6,981,000	\$2,546,000	\$1,608,000	\$2,584,000	\$226,000
T	66	6787	5891	\$4,993,000	\$1,664,000	\$1,114,000	\$4,313,000	\$157,000
TX	91	9241	50	\$6,798,000	\$2,473,000	\$1,619,000	\$2,494,000	\$227,000
TY	21	2778	0	\$2,044,000	\$751,000	\$477,000	\$751,000	\$72,000
U	55	6447	50	\$4,743,000	\$1,695,000	\$1,032,000	\$1,716,000	\$135,000
TOTAL	709	75657	6846	\$55,657,000	\$20,040,000	\$12,684,000	\$23,096,000	\$1,745,000

NOTES:

1) FOR WELL DECOMMISSIONING UNIT PRICES REFER TO TABLE 1.

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 REPAIR
UNIT PRICES**

TANK FARM	NUMBER OF WELLS	LINEAR FT. OF WELLS	Alt. 2a REMOVE WELL CASING & 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	6873	\$735.62	\$266.94	\$161.63	\$694.78	\$2,414
AX	52	4936	\$735.62	\$269.35	\$180.62	\$694.78	\$2,692
B	48	5252	\$735.62	\$257.18	\$166.54	\$694.78	\$2,424
BX	81	8772	\$735.62	\$266.15	\$168.16	\$694.78	\$2,380
BY	71	7651	\$735.62	\$268.67	\$167.57	\$694.78	\$2,390
C	70	7329	\$735.62	\$267.56	\$170.33	\$694.78	\$2,391
S	73	8471	\$735.62	\$268.54	\$160.86	\$694.78	\$2,407
SX	104	11,058	\$735.62	\$268.29	\$169.47	\$694.78	\$2,380
T	95	10,610	\$735.62	\$245.14	\$164.09	\$694.78	\$2,372
TX	97	10,141	\$735.62	\$267.56	\$175.16	\$694.78	\$2,368
TY	23	3239	\$735.62	\$270.30	\$171.62	\$694.78	\$2,482
U	59	7047	\$735.62	\$262.88	\$160.00	\$694.78	\$2,403
TOTAL	826	91379	\$735.62	\$264.28	\$167.65	\$694.78	\$2,411

**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-FARM	4	4	24	12	8	24	2
AX-FARM	13	0	78	39	26	0	6.5
B-FARM	0	0	0	0	0	0	0
BX-FARM	2	0	12	6	4	0	1
BY-FARM	1	1	6	3	2	6	0.5
C-FARM	0	0	0	0	0	0	0
S-FARM	3	2	18	9	6	12	1.5
SX-FARM	6	3	36	18	12	18	3
T-FARM	24	0	144	72	48	0	12
TX-FARM	0	0	0	0	0	0	0
TY-FARM	2	2	12	6	4	12	1
U-FARM	0	0	0	0	0	0	0
TOTAL	55	12	330	165	110	72	27.5

Table 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-FARM	2	0	12	6	4	0	1
AX-FARM	7	0	42	21	14	0	3.5
B-FARM	8	6	48	24	16	36	4
BX-FARM	17	0	102	51	34	0	8.5
BY-FARM	0	0	0	0	0	0	0
C-FARM	7	0	42	21	14	0	3.5
S-FARM	2	0	12	6	4	0	1
SX-FARM	4	3	24	12	8	18	2
T-FARM	5	4	30	15	10	24	2.5
TX-FARM	6	0	36	18	12	0	3
TY-FARM	0	0	0	0	0	0	0
U-FARM	4	4	24	12	8	24	2
TOTAL	62	17	372	186	124	102	31

Table 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-FARM	47	4	282	141	94	24	23.5
AX-FARM	32	0	192	96	64	0	16
B-FARM	40	1	240	120	80	6	20
BX-FARM	62	1	372	186	124	6	31
BY-FARM	70	1	420	210	140	6	35
C-FARM	63	4	378	189	126	24	31.5
S-FARM	68	0	408	204	136	0	34
SX-FARM	94	1	564	282	188	6	47
T-FARM	66	58	396	198	132	348	33
TX-FARM	91	1	546	273	182	6	45.5
TY-FARM	21	0	126	63	42	0	10.5
U-FARM	55	1	330	165	110	6	27.5
TOTAL	709	72	4254	2127	1418	432	354.5

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAIL

**** IBST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
ORDER OF MAGNITUDE
PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 8
 DATE 08/09/99 11:30:01
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED	CONTINGENCY		TOTAL
		TOTAL COST	%	TOTAL	DOLLARS
FDMW	FLUOR DANIEL NORTHWEST	34,440,000	30	10,330,000	44,770,000
LMHC	LOCHEED MARTIN HANFORD CORP.	7,700,000	30	2,310,000	10,010,000
SUBTOTAL		42,140,000	30	12,640,000	54,780,000
SITE	SITE ALLOCATIONS	9,570,000	30	2,870,000	12,440,000
(ADJUSTED TO MEET DOE 5100.4)					
PROJECT TOTAL		51,710,000	30	15,510,000	67,220,000

II-E-8

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/9/99	REMARKS:
FDMW LEAD ESTIMATOR	<i>DRM</i>	ESTIMATING MANAGER	<i>James H. Dejeu</i>
PROJECT MANAGER			
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 2 OF 8
 DATE 08/09/99 11:30:07
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
111100	DEFINITIVE DESIGN	1288970	0.00	0	1288970	30	386691	1675661	389591	2065252
	SUBTOTAL 11 DEFINITIVE DESIGN	1288970	0.00	0	1288970	30	386691	1675661	389591	2065252
121100	ENGINEERING DURING CONSTRUCTION	1288970	0.00	0	1288970	30	386691	1675661	389591	2065252
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	1288970	0.00	0	1288970	30	386691	1675661	389591	2065252
310011	A-FARM PULL CASING AND GROUT PIPE	2396941	0.00	0	2396941	30	719082	3116023	733774	3849797
310021	AX-FARM PULL CASING AND GROUT PIPE	1722600	0.00	0	1722600	30	516780	2239381	527331	2766712
310031	B-FARM PULL CASING AND GROUT PIPE	1832597	0.00	0	1832597	30	549779	2382376	561004	2943381
310041	BX-FARM PULL CASING AND GROUT PIPE	3057876	0.00	0	3057876	30	917362	3975239	936096	4911335
310051	BY-FARM PULL CASING AND GROUT PIPE	2667755	0.00	0	2667755	30	800326	3468081	816677	4284759
310061	C-FARM PULL CASING AND GROUT PIPE	2555668	0.00	0	2555668	30	766700	3322369	782364	4104733
310071	S-FARM PULL CASING AND GROUT PIPE	2953187	0.00	0	2953187	30	885956	3839143	904056	4743199
310081	SX-FARM PULL CASING AND GROUT PIPE	3853608	0.00	0	3853608	30	1156082	5009690	1179691	6189382
310091	T-FARM PULL CASING AND GROUT PIPE	3697664	0.00	0	3697664	30	1109299	4806963	1131952	5938916
310101	TX-FARM PULL CASING AND GROUT PIPE	3534496	0.00	0	3534496	30	1060348	4594845	1082010	5676856
310111	TY-FARM PULL CASING AND GROUT PIPE	1131981	0.00	0	1131981	30	339594	1471576	346535	1818111
310121	U-FARM PULL CASING AND GROUT PIPE	2457507	0.00	0	2457507	30	737252	3194760	752315	3947075
	SUBTOTAL 31 CONSTRUCTION FORCES	31861886	0.00	0	31861886	30	9558565	41420451	9753810	51174262
500000	OPERATING CONTRACTOR (LMHC)	7700000	0.00	0	7700000	30	2310000	10010000	1911910	11921910
PROJECT TOTAL		42,139,826	0.00	0	42,139,826	30	12,641,947	54,781,773	12,444,903	67,226,677

11-E-9

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. Z696
FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
ORDER OF MAGNITUDE
PHMCR03 - ESTIMATE BASIS SHEET

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DATE 07/22/99 07:34:56
BY KLR/DLG

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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW 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 23.6% 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 3.2% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 7% 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 DYNACORP.

C. RATES:

- (1) FOR ESTIMATING PURPOSES, AVERAGE FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR DANIEL NORTHWEST 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.

II-E-10

RPP-5002, Rev. 0

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SA11

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
ORDER OF MAGNITUDE
PHMCR03 - ESTIMATE BASIS SHEET

PAGE 4 OF 8
DATE 07/22/99 07:34:56
BY KLR/DLG

D. SITE ALLOCATIONS FACTORS:

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

- (1) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGT. RATE (23.0%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
- (3) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 23.00%
- (4) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

5. CONTINGENCY

A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORSEEN 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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

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 CONSTRUCTION FORCES.

B.) ALL CASING DISPOSED OF AS RAD MIXED WASTE. CUT CASING TO FIT IN WOOD BURIAL BOXES.

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

II-E-11

RPP-5002, Rev. 0

FLUOR DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING ** PAGE 5 OF 8
 LOCKHEED MARTIN INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLES) DATE 08/09/99 11:30:14
 JOB NO. 3696 ORDER OF MAGNITUDE BY KLR/DLC
 FILE NO. 2696SAIL PHMCR04 - COMPANY/WBS SUMMARY

CODE/WBS	DESCRIPTION	ESTIMATE	ESCALATION	SUB	CONTINGENCY	SUB	SITE	TOTAL
		SUBTOTAL	TOTAL	TOTAL	TOTAL	TOTAL	ALLOCAT'N	DOLLARS
FDNW FLUOR DANIEL NORTHWEST								
11100	DEFINITIVE DESIGN	1288970	0.00	1288970	30	386691	389591	2065252
	SUBTOTAL 11	1288970	0.00	1288970	30	386691	389591	2065252
12100	ENGINEERING DURING CONSTRUCTION	1288970	0.00	1288970	30	386691	389591	2065252
	SUBTOTAL 12	1288970	0.00	1288970	30	386691	389591	2065252
310011	A-FARM PULL CASING AND GROUT PIP	2396941	0.00	2396941	30	719082	733774	3849797
310021	AX-FARM PULL CASING AND GROUT PI	1722600	0.00	1722600	30	516780	527331	2766712
310031	B-FARM PULL CASING AND GROUT PIP	1832597	0.00	1832597	30	548779	561004	2943381
310041	BX-FARM PULL CASING AND GROUT PI	3057876	0.00	3057876	30	917362	936096	4911335
310051	BY-FARM PULL CASING AND GROUT PI	2667755	0.00	2667755	30	803226	816677	4284759
310061	C-FARM PULL CASING AND GROUT PIP	2555668	0.00	2555668	30	766700	782364	4104713
310071	S-FARM PULL CASING AND GROUT PIP	2953187	0.00	2953187	30	885956	904056	4743199
310081	SX-FARM PULL CASING AND GROUT PI	3853608	0.00	3853608	30	1156082	1179691	6189382
310091	T-FARM PULL CASING AND GROUT PIP	3697664	0.00	3697664	30	110299	1131952	5938916
310101	TX-FARM PULL CASING AND GROUT PI	3534496	0.00	3534496	30	1060348	1082010	5676856
310111	TY-FARM PULL CASING AND GROUT PI	1131981	0.00	1131981	30	339594	346535	1818111
310121	U-FARM PULL CASING AND GROUT PIP	2457507	0.00	2457507	30	737252	752315	3947075
	SUBTOTAL 31	31861886	0.00	31861886	30	9558565	9753810	51174262
	TOTAL FDNW FLUOR DANIEL NORTHWEST	34439826	0.00	34439826	30	10331947	10532993	55304767
LMHC LOCKHEED MARTIN HANFORD CORP.								
500000	OPERATING CONTRACTOR (LMHC)	7700000	0.00	7700000	30	2310000	1911910	11921910
	TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	7700000	0.00	7700000	30	2310000	1911910	11921910
	PROJECT TOTAL	42,139,826	0.00	42,139,826	30	12,641,947	12,444,903	67,226,677

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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 DATE 08/09/99 11:30:21
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
111100	DEFINITIVE DESIGN	1288970	0.00	0	0	0	1288970
	SUBTOTAL 11 DEFINITIVE DESIGN	1288970		0	0	0	1288970
121100	ENGINEERING DURING CONSTRUCTION	1288970	0.00	0	0	0	1288970
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	2577940		0	0	0	2577940
310011	A-FARM PULL CASING AND GROUT PIPE	1939273	23.60	457668	0	457668	2396941
310021	AX-FARM PULL CASING AND GROUT PIPE	1393690	23.60	328910	0	328910	1722600
310031	B-FARM PULL CASING AND GROUT PIPE	1482684	23.60	349913	0	349913	1832597
310041	BX-FARM PULL CASING AND GROUT PIPE	2474010	23.60	583866	0	583866	3057876
310051	BY-FARM PULL CASING AND GROUT PIPE	2158378	23.60	509377	0	509377	2667755
310061	C-FARM PULL CASING AND GROUT PIPE	2067693	23.60	487975	0	487975	2555668
310071	S-FARM PULL CASING AND GROUT PIPE	2389310	23.60	563877	0	563877	2953187
310081	SX-FARM PULL CASING AND GROUT PIPE	3117806	23.60	735802	0	735802	3853608
310091	T-FARM PULL CASING AND GROUT PIPE	2991638	23.60	706026	0	706026	3697664
310101	TX-FARM PULL CASING AND GROUT PIPE	2859625	23.60	674871	0	674871	3534496
310111	TY-FARM PULL CASING AND GROUT PIPE	915843	23.60	216138	0	216138	1131981
310121	U-FARM PULL CASING AND GROUT PIPE	1988275	23.60	469232	0	469232	2457507
	SUBTOTAL 31 CONSTRUCTION FORCES	25778225		6083661	0	6083661	31861886
500000	OPERATING CONTRACTOR (LMHC)	7700000	0.00	0	0	0	7700000
PROJECT TOTAL		36,056,165		6,083,661	0	6,083,661	42,139,826

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 DATE 08/09/99 11:30:50
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GFS/G&A CONST.MGMT	FDH MPR P.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	1288970	3222	0	0	296463	0	299685
	SUBTOTAL 11 DEFINITIVE DESIGN	1288970	3222	0	0	296463	0	299685
121100	ENGINEERING DURING CONSTRUCTION	1288970	3222	0	0	296463	0	299685
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	1288970	3222	0	0	296463	0	299685
310011	A-FARM PULL CASING AND GROUT PIPE	1939273	108222	105263	0	248911	102043	564441
310021	AX-FARM PULL CASING AND GROUT PIPE	1393690	77788	75649	0	178913	73288	405639
310031	B-FARM PULL CASING AND GROUT PIPE	1482684	82752	80480	0	190329	77979	431541
310041	BX-FARM PULL CASING AND GROUT PIPE	2474010	138046	134289	0	317506	130232	720074
310051	BY-FARM PULL CASING AND GROUT PIPE	2158378	120443	117156	0	277020	113592	628213
310061	C-FARM PULL CASING AND GROUT PIPE	2067693	115385	112234	0	265386	108812	601819
310071	S-FARM PULL CASING AND GROUT PIPE	2389310	133324	129691	0	306646	125765	695427
310081	SX-FARM PULL CASING AND GROUT PIPE	3117806	173955	169234	0	400097	164167	907454
310091	T-FARM PULL CASING AND GROUT PIPE	2991638	166918	162386	0	383911	157517	870732
310101	TX-FARM PULL CASING AND GROUT PIPE	2859625	159557	155220	0	366982	150555	832316
310111	TY-FARM PULL CASING AND GROUT PIPE	915843	51137	49711	0	117617	48098	266565
310121	U-FARM PULL CASING AND GROUT PIPE	1988275	110955	107923	0	255198	104626	578704
	SUBTOTAL 31 CONSTRUCTION FORCES	25778225	1438487	1399242	0	3308521	1356679	7502931
500000	OPERATING CONTRACTOR (LMHC)	7700000	0	0	1470700	0	0	1470700
PROJECT TOTAL		36,056,165	1,444,932	1,399,242	1,470,700	3,901,447	1,356,679	9,573,002

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FLOOR DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING ** PAGE 8 OF 8
 LOCKHEED MARTIN INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE) DATE 06/05/99 11:30:30
 JOB NO. 2596 ORDER OF MAGNITUDE BY KLR/DLG
 FILE NO. 2696SA11 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

WBS DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	TOTAL DOLLARS
111100 DEFINITIVE DESIGN	299685	0.00	299685	30	389591
SUBTOTAL 11 DEFINITIVE DESIGN	299685	0.00	299685	30	389591
121100 ENGINEERING DURING CONSTRUCTION	299685	0.00	299685	30	389591
SUBTOTAL 12 ENGINEERING DURING CONSTRUCTION	299685	0.00	299685	30	389591
310011 A-FARM PULL CASING AND GROUT PIPE	564441	0.00	564441	30	733774
310021 AX-FARM PULL CASING AND GROUT PIPE	405639	0.00	405639	30	527331
310031 B-FARM PULL CASING AND GROUT PIPE	431541	0.00	431541	30	561004
310041 BY-FARM PULL CASING AND GROUT PIPE	720074	0.00	720074	30	936096
310051 BU-FARM PULL CASING AND GROUT PIPE	628213	0.00	628213	30	816677
310061 C-FARM PULL CASING AND GROUT PIPE	601819	0.00	601819	30	782364
310071 S-FARM PULL CASING AND GROUT PIPE	695427	0.00	695427	30	904056
310081 SX-FARM PULL CASING AND GROUT PIPE	907454	0.00	907454	30	1179691
310091 T-FARM PULL CASING AND GROUT PIPE	870732	0.00	870732	30	1131952
310101 TX-FARM PULL CASING AND GROUT PIPE	832316	0.00	832316	30	1082010
310111 TY-FARM PULL CASING AND GROUT PIPE	266565	0.00	266565	30	346535
310121 U-FARM PULL CASING AND GROUT PIPE	578704	0.00	578704	30	752315
SUBTOTAL 31 CONSTRUCTION FORCES	7502931	0.00	7502931	30	9753810
500000 OPERATING CONTRACTOR (LMHC)	1470700	0.00	1470700	30	1911910
PROJECT TOTAL	9,573,002	0.00	9,573,002	30	12,444,903

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 5% OF TOTAL CONSTRUCTION LABOR COSTS SINCE NO REAL DESIGN BUT DECOMMISSIONING	000	15700 MHR	15700	1288970	0	0	0	0	0	1288970

SUBTOTAL	HOME OFFICE LABOR			15,700	1,288,970	0	0	0	0	0	1,288,970

TOTAL	COST CODE 00090 WBS 111100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			15,700	1,288,970	0	0	0	0	0	1,288,970

TOTAL WBS 111100	DEFINITIVE DESIGN			15,700	1,288,970	0	0	0	0	0	1,288,970

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
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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 5% OF TOTAL CONSTRUCTION LABOR COSTS	000	15700 MHR	15700	1288970	0	0	0	0	0	1288970

SUBTOTAL	HOME OFFICE LABOR			15,700		0	0	0	0	0	
					1,288,970		0		0		1,288,970

TOTAL	COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			15,700		0	0	0	0	0	
					1,288,970		0		0		1,288,970

TOTAL WBS 121100	ENGINEERING DURING CONSTRUCTION			15,700		0	0	0	0	0	
					1,288,970		0		0		1,288,970

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** TEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

FLOOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAIL

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	CONTRACT	EQUIPMENT	OH&P / B & I	TOTAL DOLLARS
310011	A-FARM PULL CASING AND GROUT PIPE										
310011.07	SITE IMPROVEMENTS	460	53 EA	0	0	0	0	0	0	0	0
310011.0701002	241-A FARM- PULL CASING & GROUT HOLE	460	1 LS	24	901	1000	0	0	0	0	1901
310011.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	756	0	0	0	0	0	756
310011.0701006	3 LABORER	460	1 LS	8	301	0	0	0	0	0	301
310011.0701008	1 TEAMSTER	460	6873 LP	10310	386934	412380	20619	0	0	1031	820964
310011.0701102	3 OPERATORS, DRILL RIG, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF	460	6873 LP	10310	324559	0	0	0	0	0	324559
310011.0701104	3 LABORERS ASSUME GROUT 3 CY/100LF	460	6873 LP	3437	129403	0	0	0	0	0	129403
310011.0701106	GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	6873 LP	0	0	0	343650	0	0	17183	360833
310011.0701108	1 TEAMSTER ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	6873 LP	0	0	0	0	0	0	0	0
310011.0701110	\$70/CP DISPOSAL X 64 CP- \$480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING	460	6873 LP	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS											
			24,113	842,854	413,380	364,269	0	0	18,214	1,638,717	
				1687	58999	26971				58999	
				5160	180370					180370	
						31299				31299	
									2913	2913	
TOTAL											
			30,961	1,082,224	413,380	422,539	0	0	21,127	1,939,271	
			30,961	1,082,224	413,380	422,539	0	0	21,127	1,939,271	
TOTAL WBS 310011 A-FARM PULL CASING AND GROUT PIPE											

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
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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	***** 241-AX FARM- PULL 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, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF. ASSUME GROUT 3 CY/100LF	460	4936 LP	7404	277872	296160	14808	0	0	740	589580
310021.0701104	3 LABORERS	460	4936 LP	7404	233078	0	0	0	0	0	233078
310021.0701106	1 TEAMSTER	460	4936 LP	2468	92920	0	0	0	0	0	92920
310021.0701108	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT. \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	4936 LP	0	0	0	246800	0	0	12340	259140
310021.0701110	***** \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	4936 LP	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS				17,332	605,828	297,160	261,608	0	0	13,080	1,177,676
	CONSUMABLES 3.20 %						19386				19386
	GENERAL FOREMAN 7.00 %			1213	42407						42407
	GENERAL REQUIREMENTS 20.00 %			3709	129647						129647
	SALES TAX 8.00 %						22479		0		22479
	OH&P (ON MARKUPS ONLY)									2093	2093
TOTAL COST CODE 46007				22,254	777,883	297,160	303,474	0	0	15,173	1,393,690
	WBS 310021 (ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021 AX-FARM PULL CASING AND GROUT PIPE				22,254	777,883	297,160	303,474	0	0	15,173	1,393,690

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SA11

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 LP	7878	295661	315120	15756	0	0	788	627325
310031.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	5252 LP	7878	247999	0	0	0	0	0	247999
310031.0701106	1 TEAMSTER	460	5252 LP	2626	98869	0	0	0	0	0	98869
310031.0701108	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LP WILL FILL 1/2 BOX BY WEIGHT.	460	5252 LP	0	0	0	262600	0	0	13130	275730
310031.0701110	***** \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	5252 LP	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS				18,438	644,487	316,120	278,356	0	0	13,918	1,252,881
CONSUMABLES 3.20 %							20623				20623
GENERAL FOREMAN 7.00 %				1290	45114						45114
GENERAL REQUIREMENTS 20.00 %				3945	137920						137920
SALES TAX 8.00 %							23918		0		23918
OH&P (ON MARKUPS ONLY)										2227	2227
TOTAL COST CODE 46007				23,674	827,521	316,120	322,897	0	0	16,145	1,482,684
WBS 310031											
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310031 B-FARM PULL CASING AND GROUT PIPE				23,674	827,521	316,120	322,897	0	0	16,145	1,482,684

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	1316	1047772
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. \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	8772 LF	0	0	0	438600	0	0	21930	460530
310041.0701110	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT. \$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		527,320		0		23,246		2,090,607
CONSUMABLES 3.20 %					1,075,125		464,916		0		34404
GENERAL FOREMAN 7.00 %			2153		75258		34404				75258
GENERAL REQUIREMENTS 20.00 %			6582		230076						230076
SALES TAX 8.00 %							39945		0		39945
OH&P (ON MARKUPS ONLY)									3717		3717
TOTAL COST CODE 46007			39,493		527,320		0		26,963		2,474,009
WBS 310041					1,380,460		539,265		0		2,474,009
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310041 BX-FARM PULL CASING AND GROUT PIPE			39,493		527,320		0		26,963		2,474,009
					1,380,460		539,265		0		2,474,009

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
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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	***** 241-BY FARM- PULL CASING AND GROUT HOLES *****	460	71 BA	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, HYD. CRANE, CASING JACKS. ASSUME CONTAMINATED @ 7 DAYS/100LF. ASSUME GROUT 3 CY/100LF	460	7651 LF	11477	430732	459060	22953	0	0	1148	913893
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	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	7651 LF	0	0	0	382550	0	0	19128	401678
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		20,276	
	CONSUMABLES 3.20 %				938,035		405,503		0		1,823,874
	GENERAL FOREMAN 7.00 %			1878	65662		30017				30017
	GENERAL REQUIREMENTS 20.00 %			5742	200739						200739
	SALES TAX 8.00 %						34841		0		34841
	OH&P (ON MARKUPS ONLY)									3242	3242
TOTAL COST CODE 46007				34,457		460,060		0		23,518	
	WBS 310051				1,204,436		470,361		0		2,158,377
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310051 BY-FARM PULL CASING AND GROUT PIPE				34,457		460,060		0		23,518	
					1,204,436		470,361		0		2,158,377

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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/100LP ASSUME GROUT 3 CY/100LP	460	7329 LP	10994	412605	439740	21987	0	0	1099	875431
310061.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	7329 LP	10994	346091	0	0	0	0	0	346091
310061.0701106	1 TEAMSTER	460	7329 LP	3665	137987	0	0	0	0	0	137987
310061.0701108	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LP WILL FILL 1/2 BOX BY WEIGHT.	460	7329 LP	0	0	0	366450	0	0	18323	384773
310061.0701110	***** \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	7329 LP	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS				25,709	898,641	440,740	388,437	0	0	19,422	1,747,240
	CONSUMABLES 3.20 %						28756				28756
	GENERAL FOREMAN 7.00 %			1799	62904						62904
	GENERAL REQUIREMENTS 20.00 %			5501	192309						192309
	SALES TAX 8.00 %						33375				33375
	OH&P (ON MARKUPS ONLY)								3106		3106
TOTAL COST CODE 46007				33,010	1,153,855	440,740	450,568	0	0	22,528	2,067,692
	WBS 310061										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM PULL CASING AND GROUT PIPE				33,010	1,153,855	440,740	450,568	0	0	22,528	2,067,692

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** TEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLES)
 ORDER OF MAGNITUDE
 PHNCR08 - ESTIMATE DETAIL BY WBS / COST CODE

FLOOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAIL

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	460	73 EA	0	0	0	0	0	0	0	0
310071.0701002	241-S FARM- PULL CASING 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	LABORER	460	1 LS	24	756	0	0	0	0	0	756
310071.0701008	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/100LP	460	8471 LP	12707	476894	508260	25413	0	0	1271	1011838
310071.0701104	3 LABORERS	460	8471 LP	12707	400016	0	0	0	0	0	400016
310071.0701106	GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	8471 LP	4236	159485	0	0	0	0	0	159485
310071.0701108	ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LP WILL FILL 1/2 BOX BY WEIGHT.	460	8471 LP	0	0	0	423550	0	0	21178	444728
310071.0701110	\$70/CF DISPOSAL X 64 CF- \$480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING	460	8471 LP	0	0	0	0	0	0	0	0

SUBTOTAL SITE IMPROVEMENTS											
			29,706	1,038,353	509,260	448,963	33227	0	22,449	2,019,025	
CONSUMABLES 3.20 \$											
GENERAL FOREMAN 7.00 \$											
GENERAL REQUIREMENTS 20.00 \$											
SALES TAX 8.00 \$											
OH&P (ON MARKUPS ONLY)											
			38,142	1,333,245	509,260	520,765	0	26,039	2,389,309		
TOTAL											
			38,142	1,333,245	509,260	520,765	0	26,039	2,389,309		
WBS 310071 (ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310071 S-FARM PULL CASING AND GROUT PIPE											
			38,142	1,333,245	509,260	520,765	0	26,039	2,389,309		

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

**** IBST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
ORDER OF MAGNITUDE
 PHMCROS - 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
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 LP	16587	622510	663480	33174	0	0	1659	1320823
310081.0701104	3 LABORERS PROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	11058 LP	16587	522159	0	0	0	0	0	522159
310081.0701106	1 TEAMSTER	460	11058 LP	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. \$70/CF DISPOSAL X 64 CF= \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	11058 LP	0	0	0	552900	0	0	27645	580545
310081.0701110	*****	460	11058 LP	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS				38,759		664,480		0		29,304	
	CONSUMABLES 3.20 %				1,354,794		586,074		0		2,634,652
	GENERAL FOREMAN 7.00 %			2713	94835		43353				43353
	GENERAL REQUIREMENTS 20.00 %			8294	289925						94835
	SALES TAX 8.00 %						50354		0		289925
	OH&P (ON MARKUPS ONLY)									4685	50354
											4685
TOTAL	COST CODE 46007			49,766		664,480		0		33,989	
	WBS 310081				1,739,555		679,781		0		3,117,806
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081 SX-FARM PULL CASING AND GROUT PIPE				49,766		664,480		0		33,989	
					1,739,555		679,781		0		3,117,806

II-E-25

FLUOR DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING **
 LOCKREED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAIL
 PMCR08 - ESTIMATE DETAIL BY MBS / COST CODE
 ORDER OF MAGNITUDE
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
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ACCOUNT NUMBER DESCRIPTION COST QUANTITY MANHOURS LABOR USAGE MATERIAL CONTRACT MENT / B & I DOLLARS TOTAL

ACCOUNT NUMBER	DESCRIPTION	COST	QUANTITY	MANHOURS	LABOR USAGE	MATERIAL	CONTRACT MENT	B & I DOLLARS	TOTAL
310091.07	SITE IMPROVEMENTS								
310091.0701002	241-T FARM- PULL CASING AND GROUT HOLES	460	95 BA	0	0	0	0	0	0
310091.0701004	MOBILIZE INTO FARM- 3 OPERATORS AND EQUIPMENT	460	1 LS	24	901	1000	0	0	1901
310091.0701006	3 LABORER	460	1 LS	24	756	0	0	0	756
310091.0701008	1 TRANSTER	460	1 LS	8	301	0	0	0	301
310091.0701102	3 OPERATORS, DRILL RIG, HYD. CONTAMINATED @ 7 DAYS/100LF GRAB, CASING JACKS, ASSUME	460	10610 LF	15915	597290	636600	31830	1592	1267312
310091.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	10610 LF	15915	501004	0	0	0	501004
310091.0701106	1 TRANSTER	460	10610 LF	5305	199733	0	0	0	199733
310091.0701108	ASSUME DISPOSE OF PIPE AS MIXED WASTE, 100 LF WITH FILL 1/2 BOX BY WRIGHT.	460	10610 LF	0	0	530500	0	26525	557025
310091.0701110	\$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING	460	10610 LF	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS 37,191 637,600 562,330 0 28,117 2,528,032									
CONSUMABLES 3.20 & GENERAL FORMMAN 7.00 & GENERAL REQUIREMENTS 20.00 & SALES TAX 8.00 & OHEP (ON MARKUPS ONLY) 48314 48314 4495 4495									
TOTAL COST CODE 46007 MBS 310091 (RESALVATION 0.00% - CONTINGENCY 30.00%) 47,753 637,600 652,243 0 32,612 2,991,637									
TOTAL MBS 310091 T-FARM PULL CASING AND GROUT PIPE 47,753 637,600 652,243 0 32,612 2,991,637									

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - 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
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	1521	1211310
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. \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	10141 LF	0	0	0	507050	0	0	25353	532403
310101.0701110	*****	460	10141 LF	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS				35,551		609,460		0		26,874	
	CONSUMABLES 3.20 %				1,242,661		537,473		0		2,416,468
	GENERAL FOREMAN 7.00 %			2488	86986		39765				86986
	GENERAL REQUIREMENTS 20.00 %			7607	265929						265929
	SALES TAX 8.00 %						46179		0		46179
	OH&P (ON MARKUPS ONLY)									4297	4297
TOTAL COST CODE 46007				45,647		609,460		0		31,171	
	WBS 310101				1,595,576		623,417		0		2,859,625
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310101 TX-FARM PULL CASING AND GROUT PIPE				45,647		609,460		0		31,171	
					1,595,576		623,417		0		2,859,625

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SA11

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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 BY XLR/DLG

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 LP	4859	182358	194340	9717	0	0	486	386901
310111.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	3239 LP	4859	152961	0	0	0	0	0	152961
310111.0701106	1 TEAMSTER	460	3239 LP	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 LP	0	0	0	161950	0	0	8098	170048
310111.0701110	***** \$70/CF DISPOSAL X 64 CF- \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	3239 LP	0	0	0	0	0	0	0	0
SUBTOTAL SITE IMPROVEMENTS				11,394		195,340		0		8,584	
	CONSUMABLES 3.20 %				398,270		171,667		0		773,861
	GENERAL FOREMAN 7.00 %			797	27878		12744				12744
	GENERAL REQUIREMENTS 20.00 %			2438	85229						27878
	SALES TAX 8.00 %						14752		0		85229
	OH&P (ON MARKUPS ONLY)									1374	14752
TOTAL COST CODE 46007				14,629		195,340		0		9,958	
	WBS 310111				511,378		199,164		0		915,842
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310111 TY-FARM PULL CASING AND GROUT PIPE				14,629		195,340		0		9,958	
					511,378		199,164		0		915,842

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAIL

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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 BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL CONTRACT	SUB-	EQUIP- MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM PULL CASING AND GROUT PIPE										
310121.07	SITE IMPROVEMENTS	460	60 EA	0	0	0	0	0	0	0	0
310121.0701002	241-U FARM- PULL 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	LABORER	460	1 LS	24	756	0	0	0	0	0	756
310121.0701008	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 LP	10571	396730	422820	21141	0	0	1057	841748
310121.0701104	3 LABORERS GROUTING, LOCATING HOLES & EXCAVATION, WASTE HANDLING	460	7047 LP	10571	332775	0	0	0	0	0	332775
310121.0701106	1 TEAMSTER	460	7047 LP	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 LP	0	0	0	352350	0	0	17618	369968
310121.0701110	\$70/CP DISPOSAL X 64 CP-\$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING	460	7047 LP	0	0	0	0	0	0	0	0

SUBTOTAL	SITE IMPROVEMENTS		24,722	864,142	423,820	373,491	27652	0	18,675	1,680,128	

CONSUMABLES 3.20 \$											
GENERAL FOREMAN 7.00 \$											
GENERAL REQUIREMENTS 20.00 \$											
SALES TAX 8.00 \$											
OH&P (ON MARKUPS ONLY)											
TOTAL	COST CODE 46007		31,743	1,109,558	423,820	433,235	0	0	21,662	1,988,275	
WBS 310121 (ESCALATION 0.00% - CONTINGENCY 30.00%)											

TOTAL WBS 310121	U-FARM PULL CASING AND GROUT PIPE		31,743	1,109,558	423,820	433,235	0	0	21,662	1,988,275	

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAIL

** BEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - 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	EQUIPMENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT	900	1 LS	0	0	0	0	7700000	0	0	7700000
	30% OF TOTAL CONSTRUCTION LABOR COSTS										

	SUBTOTAL OTHER COST AND FEES				0	0	0	7,700,000	0	0	7,700,000

	TOTAL				0	0	0	7,700,000	0	0	7,700,000
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

	TOTAL WBS 500000 OPERATING CONTRACTOR (LMHC)				0	0	0	7,700,000	0	0	7,700,000

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAIL

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PULL CASING/GROUT HOLE)
 ORDER OF MAGNITUDE
 PHMCR08 - 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
REPORT TOTAL				442,933		5,494,740		7,700,000		280,890	
					16,962,816		5,617,715		0		36,056,162

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 10
 DATE 08/09/99 12:19:49
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	TOTAL	TOTAL DOLLARS
FDNN	FLUOR DANIEL NORTHWEST	12,240,000	30	3,670,000	15,910,000
LMHC	LOCHEED MARTIN HANFORD CORP.	2,750,000	30	830,000	3,580,000
SUBTOTAL		14,990,000	30	4,500,000	19,490,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	3,580,000	30	1,080,000	4,660,000
PROJECT TOTAL		18,570,000	30	5,580,000	24,150,000

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TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/9/99	REMARKS:
FDNN LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	
PROJECT MANAGER	<i>[Signature]</i>		
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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 DATE 08/09/99 12:19:57
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE	ESCALATION		SUB	CONTINGENCY		SUB	SITE	TOTAL
		SUBTOTAL	%	TOTAL	TOTAL	%	TOTAL	TOTAL	ALLOCAT'N	DOLLARS
111100	DEFINITIVE DESIGN	459760	0.00	0	459760	30	137928	597688	138962	736650
	SUBTOTAL 11 DEFINITIVE DESIGN	459760	0.00	0	459760	30	137928	597688	138962	736650
121100	ENGINEERING DURING CONSTRUCTION	459760	0.00	0	459760	30	137928	597688	138962	736650
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	459760	0.00	0	459760	30	137928	597688	138962	736650
310011	A-FARM PERF CASING AND GROUT PIPE	840219	0.00	0	840219	30	252065	1092284	276748	1369033
310021	AX-FARM PERF CASING AND GROUT PIPE	622322	0.00	0	622322	30	186696	809018	204971	1013990
310031	B-FARM PERF CASING AND GROUT PIPE	595705	0.00	0	595705	30	178711	774416	196135	970552
310041	BX-FARM PERF CASING AND GROUT PIPE	1086996	0.00	0	1086996	30	326098	1413095	358081	1771176
310051	BY-FARM PERF CASING AND GROUT PIPE	962155	0.00	0	962155	30	288646	1250802	316956	1567758
310061	C-FARM PERF CASING AND GROUT PIPE	881389	0.00	0	881389	30	264426	1145805	290175	1435981
310071	S-FARM PERF CASING AND GROUT PIPE	1064765	0.00	0	1064765	30	319429	1384195	350767	1734963
310081	SX-FARM PERF CASING AND GROUT PIPE	1388641	0.00	0	1388641	30	416592	1805233	457499	2262732
310091	T-FARM PERF CASING AND GROUT PIPE	938960	0.00	0	938960	30	281688	1220649	308939	1529588
310101	TX-FARM PERF CASING AND GROUT PIPE	1264786	0.00	0	1264786	30	379435	1644222	416678	2060901
310111	TY-FARM PERF CASING AND GROUT PIPE	409840	0.00	0	409840	30	122952	532792	134946	667738
310121	U-FARM PERF CASING AND GROUT PIPE	841016	0.00	0	841016	30	252304	1093321	276992	1370314
	SUBTOTAL 31 CONSTRUCTION FORCES	10896798	0.00	0	10896798	30	3269039	14165838	3588894	17754732
320011	A-FARM PERF CASING W/JET PACK	19440	0.00	0	19440	30	5832	25272	5001	30273
320031	B-FARM PERF CASING W/JET PACK	38272	0.00	0	38272	30	11481	49754	9846	59600
320041	BX-FARM PERF CASING W/JET PACK	6075	0.00	0	6075	30	1822	7897	1562	9460
320061	C-FARM PERF CASING W/JET PACK	38272	0.00	0	38272	30	11481	49754	9846	59600
320091	T-FARM PERF CASING W/JET PACK	291600	0.00	0	291600	30	87480	379080	75020	454100
320101	TX-FARM PERF CASING W/JET PACK	5467	0.00	0	5467	30	1640	7107	1406	8514
320121	U-FARM PERF CASING W/JET PACK	27337	0.00	0	27337	30	8201	35538	7033	42571
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	426465	0.00	0	426465	30	127939	554404	109717	664121
500000	OPERATING CONTRACTOR (LMHC)	2750000	0.00	0	2750000	30	825000	3575000	682825	4257825
PROJECT TOTAL		14,992,783	0.00	0	14,992,783	30	4,497,835	19,490,618	4,659,361	24,149,980

II-E-33

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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW 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 23.6% 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 3.2% OF DIRECT CRAFT LABOR COSTS.
- (4) SPECIAL WORK PROCEDURES (SNP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
- (5) GENERAL FOREMAN FACTOR OF 7% 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 DYNACORP.
- (7) CONTRACT ADMINISTRATION FACTOR OF 21.5% HAS BEEN APPLIED TO THE DIRECT SUBCONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT.

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 FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
- (2) FLUOR DANIEL NORTHWEST SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, PRINCE 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/F&E 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGT. RATE (23.0%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
- (3) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 23.00%
- (4) FDH SUBCONTRACT - G&A/P&E RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
- (5) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
PHMCR03 - ESTIMATE BASIS SHEET

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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 CONSTRUCTION FORCES EXCEPT CASINGS WITH DOUBLE CASING ASSUME PERFORATIONS ARE INSTALLED BY SUBCONTRACTOR USING JET PACKS.
- B.) SUBCONTRACT RATE SUPPLIED BY PDNW PROJECT MANAGER.
- C.) ESTIMATE BASIS FOR THE LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
FDNW	FLUOR DANIEL NORTHWEST									
111100	DEFINITIVE DESIGN	459760	0.00	0	459760	30	137928	597688	138962	736650
	SUBTOTAL 11 DEFINITIVE DESIGN	459760	0.00	0	459760	30	137928	597688	138962	736650
121100	ENGINEERING DURING CONSTRUCTION	459760	0.00	0	459760	30	137928	597688	138962	736650
	SUBTOTAL 12 ENGINEERING DURING CONS	459760	0.00	0	459760	30	137928	597688	138962	736650
310011	A-FARM PERP CASING AND GROUT PIP	840219	0.00	0	840219	30	252065	1092284	276748	1369033
310021	AX-FARM PERP CASING AND GROUT PI	622322	0.00	0	622322	30	186696	809018	204971	1013990
310031	B-FARM PERP CASING AND GROUT PIP	595705	0.00	0	595705	30	178711	774416	196135	970552
310041	BX-FARM PERP CASING AND GROUT PI	1086996	0.00	0	1086996	30	326098	1413095	358081	1771176
310051	BY-FARM PERP CASING AND GROUT PI	962155	0.00	0	962155	30	288646	1250802	316956	1567758
310061	C-FARM PERP CASING AND GROUT PIP	881389	0.00	0	881389	30	264416	1145805	290175	1435981
310071	S-FARM PERP CASING AND GROUT PIP	1064765	0.00	0	1064765	30	319429	1384195	350767	1734963
310081	SX-FARM PERP CASING AND GROUT PI	1388641	0.00	0	1388641	30	416592	1805233	457499	2262732
310091	T-FARM PERP CASING AND GROUT PIP	938960	0.00	0	938960	30	281688	1220649	308939	1529588
310101	TX-FARM PERP CASING AND GROUT PI	1264786	0.00	0	1264786	30	379435	1644222	416678	2060901
310111	TY-FARM PERP CASING AND GROUT PI	409840	0.00	0	409840	30	122952	532792	134946	667738
310121	U-FARM PERP CASING AND GROUT PIP	841016	0.00	0	841016	30	252304	1093321	276992	1370314
	SUBTOTAL 31 CONSTRUCTION FORCES	10896798	0.00	0	10896798	30	3269039	14165838	3588894	17754732
320011	A-FARM PERP CASING W/JET PACK	19440	0.00	0	19440	30	5832	25272	5001	30273
320031	B-FARM PERP CASING W/JET PACK	38272	0.00	0	38272	30	11481	49754	9846	59600
320041	BX-FARM PERP CASING W/JET PACK	6075	0.00	0	6075	30	1822	7897	1562	9460
320061	C-FARM PERP CASING W/JET PACK	38272	0.00	0	38272	30	11481	49754	9846	59600
320091	T-FARM PERP CASING W/JET PACK	291600	0.00	0	291600	30	87480	379080	75020	454100
320101	TX-FARM PERP CASING W/JET PACK	5467	0.00	0	5467	30	1640	7107	1406	8514
320121	U-FARM PERP CASING W/JET PACK	27337	0.00	0	27337	30	8201	35538	7033	42571
	SUBTOTAL 32 FIXED PRICE CONSTRUCTIO	426465	0.00	0	426465	30	127939	554404	109717	664121
	TOTAL FDNW FLUOR DANIEL NORTHWEST	12242783	0.00	0	12242783	30	3672835	15915618	3976536	19892155
LMHC	LOCHEED MARTIN HANFORD CORP.									
500000	OPERATING CONTRACTOR (LMHC)	2750000	0.00	0	2750000	30	825000	3575000	682825	4257825

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
	TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	2750000	0.00	0	2750000	30	825000	3575000	682825	4257825

PROJECT TOTAL		14,992,783	0.00	0	14,992,783	30	4,497,835	19,490,618	4,659,361	24,149,980

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION %	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
-----	-----	-----	-----	-----	-----	-----	-----
111100	DEFINITIVE DESIGN	459760	0.00	0	0	0	459760
	SUBTOTAL 11	459760		0	0	0	459760
121100	ENGINEERING DURING CONSTRUCTION	459760	0.00	0	0	0	459760
	SUBTOTAL 12	919520		0	0	0	919520
310011	A-FARM PERF CASING AND GROUT PIPE	679789	23.60	160430	0	160430	840219
310021	AX-FARM PERF CASING AND GROUT PIPE	503497	23.60	118825	0	118825	622322
310031	B-FARM PERF CASING AND GROUT PIPE	481962	23.60	113743	0	113743	595705
310041	BX-FARM PERF CASING AND GROUT PIPE	879447	23.60	207549	0	207549	1086996
310051	BY-FARM PERF CASING AND GROUT PIPE	778443	23.60	183712	0	183712	962155
310061	C-FARM PERF CASING AND GROUT PIPE	713098	23.60	168291	0	168291	881389
310071	S-FARM PERF CASING AND GROUT PIPE	861461	23.60	203304	0	203304	1064765
310081	SX-FARM PERF CASING AND GROUT PIPE	1123496	23.60	265145	0	265145	1388641
310091	T-FARM PERF CASING AND GROUT PIPE	759677	23.60	179283	0	179283	938960
310101	TX-FARM PERF CASING AND GROUT PIPE	1023290	23.60	241496	0	241496	1264786
310111	TY-FARM PERF CASING AND GROUT PIPE	331586	23.60	78254	0	78254	409840
310121	U-FARM PERF CASING AND GROUT PIPE	680434	23.60	160582	0	160582	841016
	SUBTOTAL 31	8816180		2080618	0	2080618	10896798
320011	A-FARM PERF CASING W/JET PACK	16000	21.50	3440	0	3440	19440
320031	B-FARM PERF CASING W/JET PACK	31500	21.50	6772	0	6772	38272
320041	BX-FARM PERF CASING W/JET PACK	5000	21.50	1075	0	1075	6075
320061	C-FARM PERF CASING W/JET PACK	31500	21.50	6772	0	6772	38272
320091	T-FARM PERF CASING W/JET PACK	240000	21.50	51600	0	51600	291600
320101	TX-FARM PERF CASING W/JET PACK	4500	21.50	967	0	967	5467
320121	U-FARM PERF CASING W/JET PACK	22500	21.50	4837	0	4837	27337
	SUBTOTAL 32	9167180		2156083	0	2156083	11323263
500000	OPERATING CONTRACTOR (LMHC)	2750000	0.00	0	0	0	2750000
PROJECT TOTAL		12,836,700		2,156,083	0	2,156,083	14,992,783

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GFS/G&A CONST.MGMT	FDH MPR F.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	459760	1149	0	0	105744	0	106894
	SUBTOTAL 11 DEFINITIVE DESIGN	459760	1149	0	0	105744	0	106894
121100	ENGINEERING DURING CONSTRUCTION	459760	1149	0	0	105744	0	106894
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	459760	1149	0	0	105744	0	106894
310011	A-FARM PERF CASING AND GROUT PIPE	679789	50549	36898	0	116264	9170	212883
310021	AX-FARM PERF CASING AND GROUT PIPE	503497	37471	27329	0	86184	6684	157670
310031	B-FARM PERF CASING AND GROUT PIPE	481962	35743	26160	0	82210	6758	150873
310041	BX-FARM PERF CASING AND GROUT PIPE	879447	65432	47736	0	150494	11783	275447
310051	BY-FARM PERF CASING AND GROUT PIPE	778443	57941	42253	0	133265	10351	243812
310061	C-FARM PERF CASING AND GROUT PIPE	713098	52929	38706	0	121737	9838	223212
310071	S-FARM PERF CASING AND GROUT PIPE	861461	64121	46760	0	147480	11459	269821
310081	SX-FARM PERF CASING AND GROUT PIPE	1123496	83631	60983	0	192353	14953	351922
310091	T-FARM PERF CASING AND GROUT PIPE	759677	55805	41235	0	128352	12252	237646
310101	TX-FARM PERF CASING AND GROUT PIPE	1023290	76154	55544	0	175156	13667	320522
310111	TY-FARM PERF CASING AND GROUT PIPE	331586	24671	17998	0	56743	4391	103805
310121	U-FARM PERF CASING AND GROUT PIPE	680434	50558	36933	0	116285	9293	213071
	SUBTOTAL 31 CONSTRUCTION FORCES	8816180	655013	478542	0	1506529	120602	2760687
320011	A-FARM PERF CASING W/JET PACK	16000	0	791	3056	0	0	3847
320031	B-FARM PERF CASING W/JET PACK	31500	0	1557	6016	0	0	7574
320041	BX-FARM PERF CASING W/JET PACK	5000	0	247	955	0	0	1202
320061	C-FARM PERF CASING W/JET PACK	31500	0	1557	6016	0	0	7574
320091	T-FARM PERF CASING W/JET PACK	240000	0	11868	45840	0	0	57708
320101	TX-FARM PERF CASING W/JET PACK	4500	0	222	859	0	0	1082
320121	U-FARM PERF CASING W/JET PACK	22500	0	1112	4297	0	0	5410
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	351000	0	17356	67041	0	0	84397
500000	OPERATING CONTRACTOR (LMHC)	2750000	0	0	525250	0	0	525250
PROJECT TOTAL		12,836,700	657,311	495,899	592,291	1,718,019	120,602	3,584,124

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB		CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL	%	TOTAL	TOTAL	%	TOTAL			
111100	DEFINITIVE DESIGN	106894	0.00	0	106894	30	32068	138962		
	SUBTOTAL 11 DEFINITIVE DESIGN	106894	0.00	0	106894	30	32068	138962		
121100	ENGINEERING DURING CONSTRUCTION	106894	0.00	0	106894	30	32068	138962		
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	106894	0.00	0	106894	30	32068	138962		
310011	A-FARM PERF CASING AND GROUT PIPE	212883	0.00	0	212883	30	63865	276748		
310021	AX-FARM PERF CASING AND GROUT PIPE	157670	0.00	0	157670	30	47301	204971		
310031	B-FARM PERF CASING AND GROUT PIPE	150873	0.00	0	150873	30	45262	196135		
310041	BX-FARM PERF CASING AND GROUT PIPE	275447	0.00	0	275447	30	82634	358081		
310051	BY-FARM PERF CASING AND GROUT PIPE	243812	0.00	0	243812	30	73143	316956		
310061	C-FARM PERF CASING AND GROUT PIPE	223212	0.00	0	223212	30	66963	290175		
310071	S-FARM PERF CASING AND GROUT PIPE	269821	0.00	0	269821	30	80946	350767		
310081	SX-FARM PERF CASING AND GROUT PIPE	351922	0.00	0	351922	30	105576	457499		
310091	T-FARM PERF CASING AND GROUT PIPE	237646	0.00	0	237646	30	71293	308939		
310101	TX-FARM PERF CASING AND GROUT PIPE	320522	0.00	0	320522	30	96156	416678		
310111	TY-FARM PERF CASING AND GROUT PIPE	103805	0.00	0	103805	30	31141	134946		
310121	U-FARM PERF CASING AND GROUT PIPE	213071	0.00	0	213071	30	63921	276992		
	SUBTOTAL 31 CONSTRUCTION FORCES	2760687	0.00	0	2760687	30	828206	3588894		
320011	A-FARM PERF CASING W/JET PACK	3847	0.00	0	3847	30	1154	5001		
320031	B-FARM PERF CASING W/JET PACK	7574	0.00	0	7574	30	2272	9846		
320041	BX-FARM PERF CASING W/JET PACK	1202	0.00	0	1202	30	360	1562		
320061	C-FARM PERF CASING W/JET PACK	7574	0.00	0	7574	30	2272	9846		
320091	T-FARM PERF CASING W/JET PACK	57708	0.00	0	57708	30	17312	75020		
320101	TX-FARM PERF CASING W/JET PACK	1082	0.00	0	1082	30	324	1406		
320121	U-FARM PERF CASING W/JET PACK	5410	0.00	0	5410	30	1623	7033		
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	84397	0.00	0	84397	30	25319	109717		
500000	OPERATING CONTRACTOR (LMHC)	525250	0.00	0	525250	30	157575	682825		
PROJECT TOTAL		3,584,124	0.00	0	3,584,124	30	1,075,237	4,659,361		

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	5600 MHR	5600	459760	0	0	0	0	0	459760
	5% OF TOTAL CONSTRUCTION COSTS SINCE NO REAL DESIGN BUT DECOMMISSIONING WELLS										
SUBTOTAL	HOME OFFICE LABOR			5,600	459,760	0	0	0	0	0	459,760
TOTAL	COST CODE 00090 WBS 111100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			5,600	459,760	0	0	0	0	0	459,760
TOTAL WBS 111100	DEFINITIVE DESIGN			5,600	459,760	0	0	0	0	0	459,760

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 5% OF TOTAL CONSTRUCTION COSTS	000	5600 MHR	5600	459760	0	0	0	0	0	459760

SUBTOTAL	HOME OFFICE LABOR			5,600		0	0	0	0	0	
					459,760		0		0		459,760

TOTAL	COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			5,600		0	0	0	0	0	
					459,760		0		0		459,760

TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				5,600		0	0	0	0	0	
					459,760		0		0		459,760

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-A FARM- PERF CASING MECHANICALLY & GROUT *****	460	49 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/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	6469 LP	4658	174815	129380	21348	0	0	1067	326610
310011.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6469 LP	4658	146634	0	0	0	0	0	146634
310011.0701106	1 TEAMSTER	460	6469 LP	1553	58470	0	0	0	0	0	58470
310011.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LF	460	404 LP	145	5442	4040	1212	0	0	61	10755
310011.0701204	3 LABORERS	460	404 LP	145	4565	0	0	0	0	0	4565
310011.0701206	1 TEAMSTER	460	404 LP	48	1807	0	0	0	0	0	1807
SUBTOTAL SITE IMPROVEMENTS				11,263		134,420		0		1,128	
	CONSUMABLES 3.20 %				393,691		22,560		0		551,799
	GENERAL FOREMAN 7.00 %			788	27558		12598				12598
	GENERAL REQUIREMENTS 20.00 %			2410	84249						27558
	SALES TAX 8.00 %						2812		0		84249
	OH&P (ON MARKUPS ONLY)									770	2812
											770
TOTAL COST CODE 46007				14,461		134,420		0		1,898	
WBS 310011					505,499		37,970		0		679,788
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310011 A-FARM PERF CASING AND GROUT PIPE				14,461		134,420		0		1,898	
					505,499		37,970		0		679,788

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-AX FARM- PERF CASING MECHANICALLY & 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/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	4936 LP	3554	133382	98720	16289	0	0	814	249205
310021.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4936 LP	3554	111880	0	0	0	0	0	111880
310021.0701106	1 TEAMSTER	460	4936 LP	1185	44615	0	0	0	0	0	44615
SUBTOTAL SITE IMPROVEMENTS				8,349	291,835	99,720	16,289	0	0	814	408,658
	CONSUMABLES 3.20 %						9338				9338
	GENERAL FOREMAN 7.00 %			584	20428						20428
	GENERAL REQUIREMENTS 20.00 %			1786	62452						62452
	SALES TAX 8.00 %						2050		0		2050
	OH&P (ON MARKUPS ONLY)									569	569
TOTAL	COST CODE 46007 WBS 310021 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			10,720	374,716	99,720	27,677	0	0	1,383	503,497
TOTAL WBS 310021 AX-FARM PERF CASING AND GROUT PIPE				10,720	374,716	99,720	27,677	0	0	1,383	503,497

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310031	B-FARM PERP CASING AND GROUT PIPE										
310031.07	SITE IMPROVEMENTS										
310031.0701002	***** 241-B FARM- PERP CASING MECHANICALLY AND GROUT HOLES *****	460	41 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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	4162 LP	2997	112477	83240	13735	0	0	687	210139
310031.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4162 LP	2997	94346	0	0	0	0	0	94346
310031.0701106	1 TEAMSTER	460	4162 LP	999	37612	0	0	0	0	0	37612
310031.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LP	460	1090 LP	392	14712	10900	3270	0	0	164	29046
310031.0701204	3 LABORERS	460	1090 LP	392	12340	0	0	0	0	0	12340
310031.0701206	1 TEAMSTER	460	1090 LP	131	4932	0	0	0	0	0	4932
SUBTOTAL SITE IMPROVEMENTS				7,964	278,377	95,140	17,005	0	0	851	391,373
CONSUMABLES 3.20 %							8908				8908
GENERAL FOREMAN 7.00 %				557	19486						19486
GENERAL REQUIREMENTS 20.00 %				1704	59572						59572
SALES TAX 8.00 %							2073				2073
OH&P (ON MARKUPS ONLY)									0	549	549
TOTAL COST CODE 46007				10,225		95,140		0		1,400	
WBS 310031					357,436		27,986		0		481,962
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310031 B-FARM PERP CASING AND GROUT PIPE				10,225	357,436	95,140	27,986	0	0	1,400	481,962

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BX-FARM PERFOR CASING AND GROUT PIPE										
310041.07	SITE IMPROVEMENTS										
310041.0701002	***** 241-BX FARM- PERFOR 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/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	8517 LF	6132	230134	170340	28106	0	0	1405	429985
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	38	6806
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		1,443	
CONSUMABLES 3.20 %					509,600		28,871		0		713,804
GENERAL FOREMAN 7.00 %				1020	35672		16307				16307
GENERAL REQUIREMENTS 20.00 %				3119	109054						35672
SALES TAX 8.00 %							3614		0		3614
OH&P (ON MARKUPS ONLY)										996	996
TOTAL	COST CODE 46007			18,719		173,890		0		2,439	
	WBS 310041				654,326		48,792		0		879,447
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310041 BX-FARM PERFOR CASING AND GROUT PIPE				18,719		173,890		0		2,439	
					654,326		48,792		0		879,447

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FLUOR DANIEL NORTHWEST, INC.
 LOCKNEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
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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 LP	5509	206753	153020	25248	0	0	1262	386283
310051.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7651 LP	5509	173423	0	0	0	0	0	173423
310051.0701106	1 TEAMSTER	460	7651 LP	1836	69125	0	0	0	0	0	69125
SUBTOTAL SITE IMPROVEMENTS				12,910	451,259	154,020	25,248	0	0	1,262	631,789
	CONSUMABLES 3.20 %						14440				14440
	GENERAL FOREMAN 7.00 %			903	31588						31588
	GENERAL REQUIREMENTS 20.00 %			2762	96569						96569
	SALES TAX 8.00 %						3175		0		3175
	OH&P (ON MARKUPS ONLY)									880	880
TOTAL COST CODE 46007				16,576	579,416	154,020	42,863	0	0	2,142	778,442
WBS 310051 (ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310051 BY-FARM PERF CASING AND GROUT PIPE				16,576	579,416	154,020	42,863	0	0	2,142	778,442

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310061	C-FARM PERP CASING AND GROUT PIPE										
310061.07	SITE IMPROVEMENTS										
310061.0701002	***** 241-C FARM- PERP CASING MECHANICALLY AND GROUT HOLES *****	460	63 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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	6474 LP	4661	174927	129480	21364	0	0	1068	326839
310061.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6474 LP	4661	146728	0	0	0	0	0	146728
310061.0701106	1 TEAMSTER	460	6374 LP	1530	57605	0	0	0	0	0	57605
310061.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LP	460	1055 LP	380	14261	10550	3165	0	0	158	28134
310061.0701204	3 LABORERS	460	1055 LP	380	11962	0	0	0	0	0	11962
310061.0701206	1 TEAMSTER	460	1055 LP	127	4782	0	0	0	0	0	4782
SUBTOTAL SITE IMPROVEMENTS				11,795		141,030		0		1,226	
	CONSUMABLES 3.20 %				412,223		24,529		0		579,008
	GENERAL FOREMAN 7.00 %			825	28855		13191				13191
	GENERAL REQUIREMENTS 20.00 %			2524	88215						28855
	SALES TAX 8.00 %						3017		0		88215
	OH&P (ON MARKUPS ONLY)									810	3017
TOTAL	COST CODE 46007			15,144		141,030		0		2,036	
	WBS 310061				529,294		40,737		0		713,098
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM PERP CASING AND GROUT PIPE				15,144		141,030		0		2,036	
					529,294		40,737		0		713,098

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
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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	***** 241-S FARM- PERF CASING MECHANICALLY 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/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	8471 LP	6099	228895	169420	27954	0	0	1398	427667
310071.0701104	ASSUME SINGLE CASING 3 LABORERS	460	8471 LP	6099	191997	0	0	0	0	0	191997
310071.0701106	1 TEAMSTER	460	8471 LP	2033	76542	0	0	0	0	0	76542
<hr/>											
SUBTOTAL	SITE IMPROVEMENTS			14,287	499,392	170,420	27,954	0	0	1,398	699,164
	CONSUMABLES 3.20 %						15980				15980
	GENERAL FOREMAN 7.00 %			1000	34957						34957
	GENERAL REQUIREMENTS 20.00 %			3057	106869						106869
	SALES TAX 8.00 %						3514		0		3514
	OH&P (ON MARKUPS ONLY)									974	974
<hr/>											
TOTAL	COST CODE 46007			18,344		170,420		0	0	2,372	
	NBS 310071				641,219		47,449		0		861,461
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
<hr/>											
TOTAL WBS 310071	S-FARM PERF CASING AND GROUT PIPE			18,344		170,420	47,449	0	0	2,372	861,461

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	SX-FARM PERP CASING AND GROUT PIPE										
310081.07	SITE IMPROVEMENTS										
310081.0701002	241-SX FARM- PERP CASING MECHANICALLY 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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	11058 LP	7962	298814	221160	36491	0	0	1825	558290
310081.0701104	ASSUME SINGLE CASING 3 LABORERS	460	11058 LP	7962	250644	0	0	0	0	0	250644
310081.0701106	1 TEAMSTER	460	11058 LP	2654	99923	0	0	0	0	0	99923
SUBTOTAL SITE IMPROVEMENTS				18,634	651,339	222,160	36,491	0	0	1,825	911,815
CONSUMABLES 3.20 %							20842				20842
GENERAL FOREMAN 7.00 %				1304	45593						45593
GENERAL REQUIREMENTS 20.00 %				3987	139386						139386
SALES TAX 8.00 %							4586				4586
OH&P (ON MARKUPS ONLY)										1271	1271
TOTAL COST CODE 46007				23,926	836,319	222,160	61,920	0	0	3,096	1,123,496
WBS 310081 (ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310081 SX-FARM PERP CASING AND GROUT PIPE				23,926	836,319	222,160	61,920	0	0	3,096	1,123,496

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IRST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
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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	***** 241-T FARM- PERF CASING MECHANICALLY AND GROUT HOLES *****	460	35 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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	4125 LP	2970	111464	82500	13613	0	0	681	208258
310091.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4125 LP	2970	93496	0	0	0	0	0	93496
310091.0701106	1 TEAMSTER	460	4125 LP	990	37274	0	0	0	0	0	37274
310091.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK. ASSUME GROUT 3 CY/100LP	460	6485 LP	2335	87633	64850	19455	0	0	973	172911
310091.0701204	3 LABORERS	460	6485 LP	2335	73506	0	0	0	0	0	73506
310091.0701206	1 TEAMSTER	460	6485 LP	778	29292	0	0	0	0	0	29292
SUBTOTAL SITE IMPROVEMENTS				12,434	434,623	148,350	33,068	0	0	1,654	617,695
	CONSUMABLES 3.20 %						13907				13907
	GENERAL FOREMAN 7.00 %			870	30423						30423
	GENERAL REQUIREMENTS 20.00 %			2660	93009						93009
	SALES TAX 8.00 %						3758		0		3758
	OH&P (ON MARKUPS ONLY)									883	883
TOTAL	COST CODE 46007			15,965	558,055	148,350	50,734	0	0	2,537	759,677
	WBS 310091										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091 T-FARM PERF CASING AND GROUT PIPE				15,965	558,055	148,350	50,734	0	0	2,537	759,677

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FLOOR DANIEL NORTHWEST, INC.
 ** FIRST - INTERACTIVE ESTIMATING **
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INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY MBS / COST CODE

ACCOUNT	DESCRIPTION	COST	QUANTITY	MANHOURS	LABOR	EQUIP	SUB-	EQUIP-	OR&P	TOTAL
310101	TX-FARM PERFOR CASING AND GROUT PIPE									
310101.07	SITE IMPROVEMENTS	460	101 EA	0	0	0	0	0	0	0
310101.0701002	241-TX FARM-PERF CASING	460								
310101.0701004	MOBILIZE INTO FARM-	460	1 TS	24	901	1000	0	0	0	1901
310101.0701006	3 OPERATORS AND EQUIPMENT	460	1 TS	24	756	0	0	0	0	756
310101.0701008	1 TEAMSTER	460	1 TS	8	301	0	0	0	0	301
310101.0701102	3 OPERATORS, DRILL RIG, ASSUME 2 CUTS EVERY 6'	460	9991 LF	7194	269991	199820	32970	0	0	504430
310101.0701104	ASSUME SINGLE CASING	460	9991 LF	7194	226467	0	0	0	0	226467
310101.0701106	3 LABORERS	460	9991 LF	2398	90285	0	0	0	0	90285
310101.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK.	460	150 LF	54	2027	1500	450	0	0	4000
310101.0701204	3 LABORERS	460	150 LF	54	1700	0	0	0	0	1700
310101.0701206	1 TEAMSTER	460	150 LF	18	678	0	0	0	0	678
SUBTOTAL	SITE IMPROVEMENTS	16,968			202,320			0	1,672	830,518
	CONSUMABLES 3.20 &				593,106			33,420		18979
	GENERAL FOREMAN 7.00 &				1187					41517
	GENERAL REQUIREMENTS 20.00 &				3631					126924
	SALES TAX 8.00 &									4191
	OH&P (ON MARKUPS ONLY)									1158
TOTAL	MBS 310101 (ESCALATION 0.00% - CONTINGENCY 30.00 %)	21,786			202,320			0	0	2,830
	COST CODE 46007	761,548			56,591			0	0	1,023,290
	MBS 310101 TX-FARM PERFOR CASING AND GROUT PIPE	21,786			202,320			0	0	1,023,290

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-TY FARM- PERF CASING MECHANICALLY 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 LP	2332	87520	64780	10689	0	0	534	163523
310111.0701104	ASSUME SINGLE CASING 3 LABORERS	460	3239 LP	2332	73411	0	0	0	0	0	73411
310111.0701106	1 TEAMSTER	460	3239 LP	777	29254	0	0	0	0	0	29254

SUBTOTAL	SITE IMPROVEMENTS			5,497	192,143	65,780	10,689	0	0	534	269,146
	CONSUMABLES 3.20 %						6148				6148
	GENERAL FOREMAN 7.00 %			384	13450						13450
	GENERAL REQUIREMENTS 20.00 %			1176	41118						41118
	SALES TAX 8.00 %						1347		0		1347
	OH&P (ON MARKUPS ONLY)									374	374

TOTAL	COST CODE 46007			7,058	246,711	65,780	18,184	0	0	908	331,584
	WBS 310111										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 310111	TY-FARM PERF CASING AND GROUT PIPE			7,058	246,711	65,780	18,184	0	0	908	331,584

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** TEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310121	U-FARM PERP CASING AND GROUT PIPE										
310121.07	SITE IMPROVEMENTS										
310121.0701002	***** 241-U FARM- PERP CASING MECHANICALLY AND GROUT HOLES *****	460	55 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, ASSUME 2 CUTS EVERY 6" ASSUME \$.3/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	6297 LP	4534	170161	125940	20780	0	0	1039	317920
310121.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6297 LP	4534	142730	0	0	0	0	0	142730
310121.0701106	1 TEAMSTER	460	6297 LP	1511	56889	0	0	0	0	0	56889
310121.0701202	3 OPERATORS, DRILL RIG, GROUT HOLES PERFORATED W/JET PACK ASSUME GROUT 3 CY/100LP	460	750 LP	270	10133	7500	2250	0	0	113	19996
310121.0701204	3 LABORERS	460	750 LP	270	8500	0	0	0	0	0	8500
310121.0701206	1 TEAMSTER	460	750 LP	90	3389	0	0	0	0	0	3389
SUBTOTAL SITE IMPROVEMENTS				11,265	393,760	134,440	23,030	0	0	1,152	552,382
	CONSUMABLES 3.20 %						12600				12600
	GENERAL FOREMAN 7.00 %			788	27563						27563
	GENERAL REQUIREMENTS 20.00 %			2410	84264						84264
	SALES TAX 8.00 %						2850		0		2850
	OH&P (ON MARKUPS ONLY)									772	772
TOTAL COST CODE 46007				14,464	505,587	134,440	38,480	0	0	1,924	680,433
WBS 310121											
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310121 U-FARM PERP CASING AND GROUT PIPE				14,464	505,587	134,440	38,480	0	0	1,924	680,433

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY WBS / COST CODE

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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320041	BX-FARM PERP CASING W/JET PACK										
320041.07	SITE IMPROVEMENTS										
320041.0701002	***** 241-BX FARM- PERP CASING W/JET PACK. 255' LENGTH *****	460	1 EA	0	0	0	0	5000	0	0	5000
SUBTOTAL SITE IMPROVEMENTS					0	0	0	5,000	0	0	5,000
TOTAL COST CODE 46007					0	0	0	5,000	0	0	5,000
WBS 320041					0	0	0	5,000	0	0	5,000
(ESCALATION 0.00% - CONTINGENCY 30.00 %)					0	0	0	5,000	0	0	5,000
TOTAL WBS 320041 BX-FARM PERP CASING W/JET PACK					0	0	0	5,000	0	0	5,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320061	C-FARM PERP CASING W/JET PACK										
320061.07	SITE IMPROVEMENTS										
320061.0701002	241-C FARM- PERP CASING W/ JET PACK. 150' AVE LENGTH	460	7 BA	0	0	0	0	31500	0	0	31500
SUBTOTAL SITE IMPROVEMENTS											
TOTAL											
WBS 320061											
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
SUBTOTAL											
TOTAL WBS 320061 C-FARM PERP CASING W/JET PACK											

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320091	T-FARM PERP CASING W/JET PACK										
320091.07	SITE IMPROVEMENTS										
320091.0701002	***** 241-T FARM- PERP CASING W/ JET PACK. 108' AVE 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 WBS 320091 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	240,000	0	0	240,000

TOTAL WBS 320091	T-FARM PERP CASING W/JET PACK			0	0	0	0	240,000	0	0	240,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS(PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 (ESCALATION 0.00% - 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

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PLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COSTS	900	1 LS	0	0	0	0	2750000	0	0	2750000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	2,750,000	0	0	2,750,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	2,750,000	0	0	2,750,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	2,750,000	0	0	2,750,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAJ1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (PERFORATE CASING & GROUT)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				198,593		1,741,690		3,101,000		24,970	
					7,469,650		499,388		0		12,836,700

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

**** IEST - INTERACTIVE ESTIMATING ****
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

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SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	7,920,000	30	2,380,000	10,300,000
LMHC	LOCHEED MARTIN HANFORD CORP.	1,790,000	30	540,000	2,330,000
SUBTOTAL		9,710,000	30	2,920,000	12,630,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	2,070,000	30	620,000	2,690,000
PROJECT TOTAL		11,780,000	30	3,540,000	15,320,000

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TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/9/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	
PROJECT MANAGER	<i>[Signature]</i>		
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST " 10,000 / 100,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
111100	DEFINITIVE DESIGN	299665	0.00	0	299665	30	89899	389564	90573	480138
	SUBTOTAL 11 DEFINITIVE DESIGN	299665	0.00	0	299665	30	89899	389564	90573	480138
121100	ENGINEERING DURING CONSTRUCTION	299665	0.00	0	299665	30	89899	389564	90573	480138
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	299665	0.00	0	299665	30	89899	389564	90573	480138
310011	A-FARM GROUT PIPE	240575	0.00	0	240575	30	72172	312747	75784	388532
310021	AX-FARM GROUT PIPE	173630	0.00	0	173630	30	52089	225720	54698	280418
310031	B-FARM GROUT PIPE	184469	0.00	0	184469	30	55340	239810	58104	297914
310041	BX-FARM GROUT PIPE	306216	0.00	0	306216	30	91864	398081	96461	494542
310051	BY-FARM GROUT PIPE	267390	0.00	0	267390	30	80217	347607	84224	431831
310061	C-FARM GROUT PIPE	256305	0.00	0	256305	30	76891	333197	80736	413934
310071	S-FARM GROUT PIPE	295725	0.00	0	295725	30	88717	384442	93149	477592
310081	SX-FARM GROUT PIPE	385130	0.00	0	385130	30	115539	500669	121310	621979
310091	T-FARM GROUT PIPE	369716	0.00	0	369716	30	110914	480630	116461	597091
310101	TX-FARM GROUT PIPE	353483	0.00	0	353483	30	106045	459528	111346	570874
310111	TY-FARM GROUT PIPE	114923	0.00	0	114923	30	34476	149400	36201	185601
310121	U-FARM GROUT PIPE	246609	0.00	0	246609	30	73982	320591	77687	398278
	SUBTOTAL 31 CONSTRUCTION FORCES	3194175	0.00	0	3194175	30	958252	4152427	1006165	5158592
320011	A-FARM PERFORATE WITH JET PACK	289777	0.00	0	289777	30	86933	376710	74551	451262
320021	AX-FARM PERFORATE WITH JET PACK	252720	0.00	0	252720	30	75816	328536	65017	393553
320031	B-FARM PERFORATE WITH JET PACK	233280	0.00	0	233280	30	69984	303264	60016	363280
320041	BX-FARM PERFORATE WITH JET PACK	398520	0.00	0	398520	30	119556	518076	102527	620603
320051	BY-FARM PERFORATE WITH JET PACK	345060	0.00	0	345060	30	103518	448578	88774	537352
320061	C-FARM PERFORATE WITH JET PACK	340200	0.00	0	340200	30	102060	442260	87523	529783
320071	S-FARM PERFORATE WITH JET PACK	354780	0.00	0	354780	30	106434	461214	91274	552488
320081	SX-FARM PERFORATE WITH JET PACK	510300	0.00	0	510300	30	153090	663390	131285	794675
320091	T-FARM PERFORATE WITH JET PACK	461700	0.00	0	461700	30	138510	600210	118782	718992
320101	TX-FARM PERFORATE WITH JET PACK	495720	0.00	0	495720	30	148716	644436	127534	771970
320111	TY-FARM PERFORATE WITH JET PACK	150660	0.00	0	150660	30	45198	195858	38760	234618
320121	U-FARM PERFORATE WITH JET PACK	291600	0.00	0	291600	30	87480	379080	75020	454100
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	4124317	0.00	0	4124317	30	1237295	5361612	1061069	6422682
500000	OPERATING CONTRACTOR (LMHC)	1794000	0.00	0	1794000	30	538200	2332200	445450	2777650

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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 DATE 08/09/99 13:45:51
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS

	PROJECT TOTAL	9,711,822	0.00	9,711,822	30	12,625,369	2,693,832	15,319,202

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BY KLR/DLG

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT)
ORDER OF MAGNITUDE
PHMCR03 - ESTIMATE BASIS SHEET

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SAK1

1. ESTIMATE PURPOSE

PLANNING/PEASIBILITY 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 PDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD PDNW 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 DYNACORP HAVE BEEN PROVIDED BY PDNW 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 23.6% 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 3.2% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 7% 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 DYNACORP.
(7) CONTRACT ADMINISTRATION FACTOR OF 21.5% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT.

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 PDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE A.E.C.M. RATES.
(2) FLUOR DANIEL NORTHWEST SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, PRINCE 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, PICA, 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGT. RATE (23.0%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
- (3) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 23.00%
- (4) FDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS
- (5) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT)
ORDER OF MAGNITUDE
PHMCRO3 - ESTIMATE BASIS SHEET

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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 PDNW PROJECT MANAGER.
- C.) ESTIMATE BASIS FOR THE LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAX1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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 DATE 08/09/99 13:45:58
 BY XLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
FDNW	FLUOR DANIEL NORTHWEST									
111100	DEFINITIVE DESIGN	299665	0.00	0	299665	30	89899	389564	90573	480138
	SUBTOTAL 11	299665	0.00	0	299665	30	89899	389564	90573	480138
121100	ENGINEERING DURING CONSTRUCTION	299665	0.00	0	299665	30	89899	389564	90573	480138
	SUBTOTAL 12	299665	0.00	0	299665	30	89899	389564	90573	480138
310011	A-FARM GROUT PIPE	240575	0.00	0	240575	30	72172	312747	75784	388532
310021	AX-FARM GROUT PIPE	173630	0.00	0	173630	30	52089	225720	54698	280418
310031	B-FARM GROUT PIPE	184469	0.00	0	184469	30	55340	239810	58104	297914
310041	BX-FARM GROUT PIPE	306216	0.00	0	306216	30	91864	398081	96461	494542
310051	BY-FARM GROUT PIPE	267390	0.00	0	267390	30	80217	347607	84224	431831
310061	C-FARM GROUT PIPE	256305	0.00	0	256305	30	76891	333197	80736	413934
310071	S-FARM GROUT PIPE	295725	0.00	0	295725	30	88717	384442	93149	477592
310081	SX-FARM GROUT PIPE	385130	0.00	0	385130	30	115539	500669	121310	621979
310091	T-FARM GROUT PIPE	369716	0.00	0	369716	30	110914	480630	116461	597091
310101	TX-FARM GROUT PIPE	353483	0.00	0	353483	30	106045	459528	111346	570874
310111	TY-FARM GROUT PIPE	114923	0.00	0	114923	30	34476	149400	36201	185601
310121	U-FARM GROUT PIPE	246609	0.00	0	246609	30	73982	320591	77687	398278
	SUBTOTAL 31	3194175	0.00	0	3194175	30	958252	4152427	1006165	5158592
320011	A-FARM PERFORATE WITH JET PACK	289777	0.00	0	289777	30	86933	376710	74551	451262
320021	AX-FARM PERFORATE WITH JET PACK	252720	0.00	0	252720	30	75816	328536	65017	393553
320031	B-FARM PERFORATE WITH JET PACK	233280	0.00	0	233280	30	69984	303264	60016	363280
320041	BX-FARM PERFORATE WITH JET PACK	398520	0.00	0	398520	30	119556	518076	102527	620603
320051	BY-FARM PERFORATE WITH JET PACK	345060	0.00	0	345060	30	103518	448578	88774	537352
320061	C-FARM PERFORATE WITH JET PACK	340200	0.00	0	340200	30	102060	442260	87523	529783
320071	S-FARM PERFORATE WITH JET PACK	354780	0.00	0	354780	30	106434	461214	91274	552488
320081	SX-FARM PERFORATE WITH JET PACK	510300	0.00	0	510300	30	153090	663390	131285	794675
320091	T-FARM PERFORATE WITH JET PACK	461700	0.00	0	461700	30	138510	600210	118782	718992
320101	TX-FARM PERFORATE WITH JET PACK	495720	0.00	0	495720	30	148716	644436	127534	771970
320111	TY-FARM PERFORATE WITH JET PACK	150660	0.00	0	150660	30	45198	195858	38760	234618
320121	U-FARM PERFORATE WITH JET PACK	291600	0.00	0	291600	30	87480	379080	75020	454100
	SUBTOTAL 32	4124317	0.00	0	4124317	30	1237295	5361612	1061069	6422682

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

**** IEST - INTERACTIVE ESTIMATING ****
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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ESTIMATE	ESCALATION	SUB	CONTINGENCY	SUB	SITE	TOTAL			
SUBTOTAL	% TOTAL	TOTAL	% TOTAL	TOTAL	ALLOCAT'N	DOLLARS			

TOTAL FDNW FLUOR DANIEL NORTHWEST	7917822	0.00	0	7917822	30	2375346	10293169	2248382	12541552
LMHC LOCKHEED MARTIN HANFORD CORP.									
500000 OPERATING CONTRACTOR (LMHC)	1794000	0.00	0	1794000	30	538200	2332200	445450	2777650
TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	1794000	0.00	0	1794000	30	538200	2332200	445450	2777650

PROJECT TOTAL	9,711,822	0.00	0	9,711,822	30	2,913,546	12,625,369	2,693,832	15,319,202

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT %		OTHER COSTS	SUB TOTAL	TOTAL
-----	-----	-----	-----	-----	-----	-----	-----
111100	DEFINITIVE DESIGN	299665	0.00	0	0	0	299665
	SUBTOTAL 11 DEFINITIVE DESIGN	299665		0	0	0	299665
121100	ENGINEERING DURING CONSTRUCTION	299665	0.00	0	0	0	299665
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	599330		0	0	0	599330
310011	A-FARM GROUT PIPE	194640	23.60	45935	0	45935	240575
310021	AX-FARM GROUT PIPE	140478	23.60	33152	0	33152	173630
310031	B-FARM GROUT PIPE	149247	23.60	35222	0	35222	184469
310041	BX-FARM GROUT PIPE	247748	23.60	58468	0	58468	306216
310051	BY-FARM GROUT PIPE	216335	23.60	51055	0	51055	267390
310061	C-FARM GROUT PIPE	207367	23.60	48938	0	48938	256305
310071	S-FARM GROUT PIPE	239260	23.60	56465	0	56465	295725
310081	SX-FARM GROUT PIPE	311594	23.60	73536	0	73536	385130
310091	T-FARM GROUT PIPE	299123	23.60	70593	0	70593	369716
310101	TX-FARM GROUT PIPE	285990	23.60	67493	0	67493	353483
310111	TY-FARM GROUT PIPE	92980	23.60	21943	0	21943	114923
310121	U-FARM GROUT PIPE	199522	23.60	47087	0	47087	246609
	SUBTOTAL 31 CONSTRUCTION FORCES	2584284		609891	0	609891	3194175
320011	A-FARM PERFORATE WITH JET PACK	238500	21.50	51277	0	51277	289777
320021	AX-FARM PERFORATE WITH JET PACK	208000	21.50	44720	0	44720	252720
320031	B-FARM PERFORATE WITH JET PACK	192000	21.50	41280	0	41280	233280
320041	BX-FARM PERFORATE WITH JET PACK	328000	21.50	70520	0	70520	398520
320051	BY-FARM PERFORATE WITH JET PACK	284000	21.50	61060	0	61060	345060
320061	C-FARM PERFORATE WITH JET PACK	280000	21.50	60200	0	60200	340200
320071	S-FARM PERFORATE WITH JET PACK	292000	21.50	62780	0	62780	354780
320081	SX-FARM PERFORATE WITH JET PACK	420000	21.50	90300	0	90300	510300
320091	T-FARM PERFORATE WITH JET PACK	380000	21.50	81700	0	81700	461700
320101	TX-FARM PERFORATE WITH JET PACK	408000	21.50	87720	0	87720	495720
320111	TY-FARM PERFORATE WITH JET PACK	124000	21.50	26660	0	26660	150660
320121	U-FARM PERFORATE WITH JET PACK	240000	21.50	51600	0	51600	291600
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	5978784		1339708	0	1339708	7318492
500000	OPERATING CONTRACTOR (LMHC)	1794000	0.00	0	0	0	1794000

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FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
ORDER OF MAGNITUDE
PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT %	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL

PROJECT TOTAL		8,372,114		1,339,708	0	1,339,708	9,711,822

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	PDH GFS/G&A CONST.MGMT	PDH MPR P.P./S.C.	PDH GFS/G&A LABOR	PDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	299665	749	0	0	68922	0	69672
	SUBTOTAL 11 DEFINITIVE DESIGN	299665	749	0	0	68922	0	69672
121100	ENGINEERING DURING CONSTRUCTION	299665	749	0	0	68922	0	69672
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	299665	749	0	0	68922	0	69672
310011	A-FARM GROUT PIPE	194640	12586	10565	0	28948	6195	58295
310021	AX-FARM GROUT PIPE	140478	9090	7625	0	20907	4453	42075
310031	B-FARM GROUT PIPE	149247	9653	8101	0	22203	4737	44696
310041	BX-FARM GROUT PIPE	247748	16014	13447	0	36833	7904	74201
310051	BY-FARM GROUT PIPE	216335	13984	11742	0	32165	6895	64788
310061	C-FARM GROUT PIPE	207367	13407	11255	0	30836	6606	62105
310071	S-FARM GROUT PIPE	239260	15464	12987	0	35568	7633	71653
310081	SX-FARM GROUT PIPE	311594	20133	16913	0	46307	9961	93315
310091	T-FARM GROUT PIPE	299123	19330	16236	0	44460	9558	89585
310101	TX-FARM GROUT PIPE	285990	18482	15523	0	42509	9136	85650
310111	TY-FARM GROUT PIPE	92980	6022	5046	0	13851	2925	27847
310121	U-FARM GROUT PIPE	199522	12902	10830	0	29674	6352	59759
	SUBTOTAL 31 CONSTRUCTION FORCES	2584284	167072	140274	0	384266	82360	773973
320011	A-FARM PERFORATE WITH JET PACK	238500	0	11793	45553	0	0	57347
320021	AX-FARM PERFORATE WITH JET PACK	208000	0	10285	39728	0	0	50013
320031	B-FARM PERFORATE WITH JET PACK	192000	0	9494	36672	0	0	46166
320041	BX-FARM PERFORATE WITH JET PACK	328000	0	16219	62648	0	0	78867
320051	BY-FARM PERFORATE WITH JET PACK	284000	0	14043	54244	0	0	68287
320061	C-FARM PERFORATE WITH JET PACK	280000	0	13846	53480	0	0	67326
320071	S-FARM PERFORATE WITH JET PACK	292000	0	14439	55772	0	0	70211
320081	SX-FARM PERFORATE WITH JET PACK	420000	0	20769	80220	0	0	100989
320091	T-FARM PERFORATE WITH JET PACK	380000	0	18791	72580	0	0	91371
320101	TX-FARM PERFORATE WITH JET PACK	408000	0	20175	77928	0	0	98103
320111	TY-FARM PERFORATE WITH JET PACK	124000	0	6131	23684	0	0	29815
320121	U-FARM PERFORATE WITH JET PACK	240000	0	11868	45840	0	0	57708
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	3394500	0	167858	648349	0	0	816207
500000	OPERATING CONTRACTOR (LMHC)	1794000	0	0	342654	0	0	342654

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 DATE 08/09/99 13:46:32
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GPS/G&A CONST.MGMT	FDH MPR P.P./S.C.	FDH GPS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL

PROJECT TOTAL								
		8,372,114	168,570	308,132	991,003	522,111	82,360	2,072,179

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB		CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL		%	TOTAL	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	69672		0.00	0	69672		30	20901	90573
	SUBTOTAL 11 DEFINITIVE DESIGN	69672		0.00	0	69672		30	20901	90573
121100	ENGINEERING DURING CONSTRUCTION	69672		0.00	0	69672		30	20901	90573
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	69672		0.00	0	69672		30	20901	90573
310011	A-FARM GROUT PIPE	58295		0.00	0	58295		30	17488	75784
310021	AX-FARM GROUT PIPE	42075		0.00	0	42075		30	12622	54698
310031	B-FARM GROUT PIPE	44696		0.00	0	44696		30	13408	58104
310041	BX-FARM GROUT PIPE	74201		0.00	0	74201		30	22260	96461
310051	BY-FARM GROUT PIPE	64788		0.00	0	64788		30	19435	84224
310061	C-FARM GROUT PIPE	62105		0.00	0	62105		30	18631	80736
310071	S-FARM GROUT PIPE	71653		0.00	0	71653		30	21496	93149
310081	SX-FARM GROUT PIPE	93315		0.00	0	93315		30	27994	121310
310091	T-FARM GROUT PIPE	89585		0.00	0	89585		30	26875	116461
310101	TX-FARM GROUT PIPE	85650		0.00	0	85650		30	25695	111346
310111	TY-FARM GROUT PIPE	27847		0.00	0	27847		30	8354	36201
310121	U-FARM GROUT PIPE	59759		0.00	0	59759		30	17927	77687
	SUBTOTAL 31 CONSTRUCTION FORCES	773973		0.00	0	773973		30	232192	1006165
320011	A-FARM PERFORATE WITH JET PACK	57347		0.00	0	57347		30	17204	74551
320021	AX-FARM PERFORATE WITH JET PACK	50013		0.00	0	50013		30	15004	65017
320031	B-FARM PERFORATE WITH JET PACK	46166		0.00	0	46166		30	13849	60016
320041	BX-FARM PERFORATE WITH JET PACK	78867		0.00	0	78867		30	23660	102527
320051	BY-FARM PERFORATE WITH JET PACK	68287		0.00	0	68287		30	20486	88774
320061	C-FARM PERFORATE WITH JET PACK	67326		0.00	0	67326		30	20197	87523
320071	S-FARM PERFORATE WITH JET PACK	70211		0.00	0	70211		30	21063	91274
320081	SX-FARM PERFORATE WITH JET PACK	100989		0.00	0	100989		30	30296	131285
320091	T-FARM PERFORATE WITH JET PACK	91371		0.00	0	91371		30	27411	118782
320101	TX-FARM PERFORATE WITH JET PACK	98103		0.00	0	98103		30	29431	127534
320111	TY-FARM PERFORATE WITH JET PACK	29815		0.00	0	29815		30	8944	38760
320121	U-FARM PERFORATE WITH JET PACK	57708		0.00	0	57708		30	17312	75020
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	816207		0.00	0	816207		30	244862	1061069
500000	OPERATING CONTRACTOR (LMHC)	342654		0.00	0	342654		30	102796	445450

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FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. Z696
FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
ORDER OF MAGNITUDE
PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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WBS DESCRIPTION	SITE ALLOC	ESCALATION		SUB	CONTINGENCY		TOTAL
	SUBTOTAL	%	TOTAL	TOTAL	%	TOTAL	DOLLARS

PROJECT TOTAL	2,072,179	0.00	0	2,072,179	30	621,653	2,693,832

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** TEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	CONTRACT	SUB-	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
111100	DEFINITIVE DESIGN											
111100.90	HOME OFFICE LABOR	000	3650	MHR	299,665	0	0	0	0	0	0	299,665
111100.9000102	DESIGN											
	5% OF TOTAL CONSTRUCTION COSTS SINCE NO REAL DESIGN BUT DECOMMISSIONING WELLS											
	SUBTOTAL HOME OFFICE LABOR				3,650	0	0	0	0	0	0	299,665
	TOTAL				3,650	0	0	0	0	0	0	299,665
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
	TOTAL WBS 111100 DEFINITIVE DESIGN				3,650	0	0	0	0	0	0	299,665

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 5% OF TOTAL CONSTRUCTION COSTS	000	3650	MHR	3650	299665	0	0	0	0	299665
SUBTOTAL HOME OFFICE LABOR					3,650	299,665	0	0	0	0	299,665
TOTAL COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)					3,650	299,665	0	0	0	0	299,665
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION					3,650	299,665	0	0	0	0	299,665

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	241-A FARM- GROUT CASING AFTER SUB. PERFORATES CASING	460	53 EA	0	0	0	0	0	0	0	0
310011.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	0	1200
310011.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310011.0701008	1 TEAMSTER	460	1 LS	8	301	0	0	0	0	0	301
310011.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LP	460	6873 LP	1100	41283	41238	20619	0	0	1031	104171
310011.0701104	2 LABORERS	460	6873 LP	1100	34628	0	0	0	0	0	34628
310011.0701106	1 TEAMSTER	460	6873 LP	550	20708	0	0	0	0	0	20708
SUBTOTAL SITE IMPROVEMENTS				2,790	98,024	41,838	20,619	0	0	1,031	161,512
	CONSUMABLES 3.20 %						3136				3136
	GENERAL FOREMAN 7.00 %			195	6861						6861
	GENERAL REQUIREMENTS 20.00 %			597	20977						20977
	SALES TAX 8.00 %						1900		0		1900
	OH&P (ON MARKUPS ONLY)									251	251
TOTAL	COST CODE 46007 WBS 310011 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			3,582	125,862	41,838	25,656	0	0	1,282	194,639
TOTAL WBS 310011 A-FARM GROUT PIPE				3,582	125,862	41,838	25,656	0	0	1,282	194,639

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** TEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING.W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	460	52 EA	0	0	0	0	0	0	0	0
310021.0701002	241-AX FARM- GROUT CASING										
	APTR SUB. PERFORATES CASING										
310021.0701004	MOBILIZE INTO FARM-	460	1 LS	16	600	600	0	0	0	0	1200
	2 OPERATORS AND EQUIPMENT										
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	GROUT HOLES-	460	4936 LP	790	29649	29616	14808	0	0	740	74813
	2 OPERATORS, EQUIPMENT										
	ASSUME GROUT 3 CY/100LF										
310021.0701104	2 LABORERS	460	4936 LP	790	24869	0	0	0	0	0	24869
310021.0701106	1 TEAMSTER	460	4936 LP	395	14872	0	0	0	0	0	14872
SUBTOTAL SITE IMPROVEMENTS											
			2,015		70,795	30,216	14,808	0	0	740	116,559
					4955		2265				2265
				141							4955
				431	15150						15150
							1365				1365
									181		181
TOTAL											
			2,587		90,900	30,216	18,439	0	0	921	140,477
			(ESCALATION 0.00% - CONTINGENCY 30.00 %)								
TOTAL WBS 310021 AX-FARM GROUT PIPE											
			2,587		90,900	30,216	18,439	0	0	921	140,477

FLUOR DANIEL NORTHWEST, INC.
 LOCKNEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-B FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	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	600	0	0	0	0	1200
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	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LP	460	5252 LP	840	31525	31512	15756	0	0	788	79581
310031.0701104	2 LABORERS	460	5252 LP	840	26443	0	0	0	0	0	26443
310031.0701106	1 TEAMSTER *****	460	5252 LP	420	15813	0	0	0	0	0	15813
SUBTOTAL SITE IMPROVEMENTS				2,140	75,186	32,112	15,756	0	0	788	123,842
	CONSUMABLES 3.20 %						2405				2405
	GENERAL FOREMAN 7.00 %			149	5263						5263
	GENERAL REQUIREMENTS 20.00 %			457	16089						16089
	SALES TAX 8.00 %						1452		0		1452
	OH&P (ON MARKUPS ONLY)									192	192
TOTAL	COST CODE 46007 WBS 310031 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			2,747	96,538	32,112	19,614	0	0	980	149,246
TOTAL WBS 310031 B-FARM GROUT PIPE				2,747	96,538	32,112	19,614	0	0	980	149,246

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

**** IEST - INTERACTIVE ESTIMATING ****
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANROURS	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	***** 241-BX FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	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	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	1316	132956
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
<hr/>											
SUBTOTAL	SITE IMPROVEMENTS			3,550	124,725	53,232	26,316	0	0	1,316	205,589
	CONSUMABLES 3.20 %						3991				3991
	GENERAL FOREMAN 7.00 %			248	8730						8730
	GENERAL REQUIREMENTS 20.00 %			759	26691						26691
	SALES TAX 8.00 %						2424		0		2424
	OH&P (ON MARKUPS ONLY)									320	320
<hr/>											
TOTAL	COST CODE 46007			4,558	160,146	53,232	32,731	0	0	1,636	247,747
	WBS 310041										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
<hr/>											
TOTAL WBS 310041	BX-FARM GROUT PIPE			4,558	160,146	53,232	32,731	0	0	1,636	247,747

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-BY FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	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	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/100LP	460	7651 LP	1224	45937	45906	22953	0	0	1148	115944
310051.0701104	2 LABORERS	460	7651 LP	1224	38532	0	0	0	0	0	38532
310051.0701106	1 TEAMSTER *****	460	7651 LP	612	23042	0	0	0	0	0	23042

SUBTOTAL	SITE IMPROVEMENTS			3,100		46,506		0		1,148	
	CONSUMABLES 3.20 %				108,916		22,953		0		179,523
	GENERAL FOREMAN 7.00 %			217	7624		3485				7624
	GENERAL REQUIREMENTS 20.00 %			663	23308						23308
	SALES TAX 8.00 %						2115		0		2115
	OH&P (ON MARKUPS ONLY)									280	280

TOTAL	COST CODE 46007			3,980		46,506		0		1,428	
	WBS 310051				139,848		28,553		0		216,335
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 310051	BY-FARM GROUT PIPE			3,980		46,506		0		1,428	
					139,848		28,553		0		216,335

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAKI

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERP CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-C FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	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	600	0	0	0	0	1200
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- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	7329 LP	1173	44023	43974	21987	0	0	1099	111083
310061.0701104	2 LABORERS	460	7329 LP	1173	36926	0	0	0	0	0	36926
310061.0701106	1 TEAMSTER *****	460	7329 LP	586	22063	0	0	0	0	0	22063
SUBTOTAL SITE IMPROVEMENTS				2,972		44,574		0		1,099	
	CONSUMABLES 3.20 %				104,417		21,987		0		172,077
	GENERAL FOREMAN 7.00 %			208	7309		3341				3341
	GENERAL REQUIREMENTS 20.00 %			636	22345						7309
	SALES TAX 8.00 %						2026		0		22345
	OH&P (ON MARKUPS ONLY)									268	2026
TOTAL COST CODE 46007				3,816		44,574		0		1,367	
	WBS 310061				134,071		27,354		0		207,367
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061 C-FARM GROUT PIPE				3,816		44,574		0		1,367	
					134,071		27,354		0		207,367

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** TEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERP CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-S FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	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	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	1271	128363
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	120,440	51,426	25,413	0	0	1,271	198,550
	CONSUMABLES 3.20 %						3854				3854
	GENERAL FOREMAN 7.00 %			239	8430						8430
	GENERAL REQUIREMENTS 20.00 %			733	25774						25774
	SALES TAX 8.00 %						2341		0		2341
	OH&P (ON MARKUPS ONLY)									309	309
TOTAL	COST CODE 46007 WBS 310071 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			4,401	154,644	51,426	31,608	0	0	1,580	239,260
TOTAL WBS 310071 S-FARM GROUT PIPE				4,401	154,644	51,426	31,608	0	0	1,580	239,260

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** BEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHNCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIPMENT	OH&P / B & I	TOTAL DOLLARS
310081	SX-FARM GROUT PIPE										
310081.07	SITE IMPROVEMENTS	460	105 EA	0	0	0	0	0	0	0	0
310081.0701002	241-SX FARM- GROUT CASING AFTER SUB. PERFORATES CASING	460	1 LS	16	600	600	0	0	0	0	1200
310081.0701004	2 OPERATORS AND EQUIPMENT	460	1 LS	16	504	0	0	0	0	0	504
310081.0701006	2 LABORERS	460	1 LS	8	301	0	0	0	0	0	301
310081.0701008	1 TEAMSTER	460	11058 LP	1769	66391	66348	33174	0	0	1659	167572
310081.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	11058 LP	1769	55688	0	0	0	0	0	55688
310081.0701104	2 LABORERS	460	11058 LP	885	33320	0	0	0	0	0	33320
310081.0701106	1 TEAMSTER										
SUBTOTAL SITE IMPROVEMENTS											
				4,463	156,804	66,948	33,174	0	0	1,659	258,585
							5017				5017
				312	10976						10976
				955	33556						33556
							3055		0	403	3055
											403
TOTAL											
				5,730	201,336	66,948	41,247	0	0	2,062	311,594
TOTAL WBS 310081 SX-FARM GROUT PIPE											
				5,730	201,336	66,948	41,247	0	0	2,062	311,594

FLOOR DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING **
 LOCKERD MARTIN INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 JOB NO. 2696 ORDER OF MAGNITUDE
 FILE NO. 2696SAXI PHMCROS - ESTIMATE DETAIL BY MBS / COST CODE
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 TOTAL OHPF / B & I DOLLARS

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR USAGE	EQUIP MATERIAL	SUB-CONTRACT	EQUIP-MENT	TOTAL
310091.07	SITE IMPROVEMENTS								
310091.0701002	241-T FARM-GROUT CASING	95 BA	0	0	0	0	0	0	0
310091.0701008	2 OPERATORS AND EQUIPMENT	1 LS	16	600	600	0	0	0	1200
310091.0701006	2 LABORER	1 LS	16	504	504	0	0	0	504
310091.0701008	1 TRAMSTER	1 LS	8	301	301	0	0	0	301
310091.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	10610 LF	1698	63726	63660	31830	0	0	160808
310091.0701104	2 LABORERS	10610 LF	1698	53453	53453	0	0	0	53453
310091.0701106	1 TRAMSTER	10610 LF	849	31965	31965	0	0	0	31965

310091	T-FARM GROUT PIPE								
310091	SUBTOTAL SITE IMPROVEMENTS		4,285	150,549	64,260	31,830	0	1,592	248,231
	CONSUMABLES 3.20 %			4817					4817
	GENERAL FOREMAN 7.00 %			10538					10538
	GENERAL REQUIREMENTS 20.00 %			32217					32217
	SALES TAX 8.00 %			2931					2931
	OHPF (ON MARKUPS ONLY)							387	387
TOTAL	COST CODE 46007		5,501	193,304	64,260	39,579	0	1,979	299,123
	MBS 310091								
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)								

TOTAL	MBS 310091		5,501	193,304	64,260	39,579	0	1,979	299,123
	TOTAL MBS 310091 T-FARM GROUT PIPE			193,304	64,260	39,579	0	1,979	299,123

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

**** IEST - INTERACTIVE ESTIMATING ****
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-TX FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	460	102 EA	0	0	0	0	0	0	0	0
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	1521	153701
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
<hr/>											
SUBTOTAL	SITE IMPROVEMENTS			4,097		61,446		0		1,521	237,332
	CONSUMABLES 3.20 %				143,942		30,423		0		4606
	GENERAL FOREMAN 7.00 %			286	10075						10075
	GENERAL REQUIREMENTS 20.00 %			876	30803						30803
	SALES TAX 8.00 %						2802		0		2802
	OH&P (ON MARKUPS ONLY)									370	370
<hr/>											
TOTAL	COST CODE 46007			5,260		61,446		0		1,891	285,990
	WBS 310101				184,821		37,831		0		285,990
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
<hr/>											
TOTAL WBS 310101	TX-FARM GROUT PIPE			5,260		61,446		0		1,891	285,990
					184,821		37,831		0		285,990

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERP CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMC08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-TY FARM- GROUT CASING AFTER SUB. PERFORATES CASING *****	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	600	0	0	0	0	1200
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- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	3239 LF	518	19441	19434	9717	0	0	486	49078
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	46,904	20,034	9,717	0	0	486	77,141
	CONSUMABLES 3.20 %						1500				1500
	GENERAL FOREMAN 7.00 %			93	3283						3283
	GENERAL REQUIREMENTS 20.00 %			285	10037						10037
	SALES TAX 8.00 %						897		0		897
	OH&P (ON MARKUPS ONLY)									119	119

TOTAL	COST CODE 46007			1,714	60,224	20,034	12,115	0	0	605	92,980
	WBS 310111										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 310111	TY-FARM GROUT PIPE			1,714	60,224	20,034	12,115	0	0	605	92,980

II-E-91

ACCOUNT NUMBER	DESCRIPTION	COST	QUANTITY	MANHOURS	LABOR	USAGE	MATERIAL	CONTRACT	EQUIP-ORHP	TOTAL
310121.07	SITE IMPROVEMENTS	460	60 LP	0	0	0	0	0	0	0
310121.0701002	241-U FARM- GROUT CASING	460								
310121.0701004	MOBILIZE INTO FARM- 2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	600	0	0	0	1200
310121.0701006	2 LABORER	460	1 LS	16	504	504	0	0	0	504
310121.0701008	1 TEAMSTER	460	1 LS	8	301	301	0	0	0	301
310121.0701102	GROUT HOLES- 2 OPERATORS, EQUIPMENT ASSUME GROUT 3 CY/100LF	460	7047 LP	1128	42334	42282	21141	0	0	106814
310121.0701104	2 LABORERS	460	7047 LP	1128	35509	35509	0	0	0	35509
310121.0701106	1 TEAMSTER	460	7047 LP	564	21235	21235	0	0	0	21235

SUBTOTAL SITE IMPROVEMENTS										
		2,860		42,882	21,141			0	0	165,563
	CONSUMABLES 3.20 %						3215		0	3215
	GENERAL FOREMAN 7.00 %						7033		0	7033
	GENERAL REQUIREMENTS 20.00 %						21503		0	21503
	SALES TAX 8.00 %						1948		0	1948
	OH&P (ON MARKUPS ONLY)								0	258

TOTAL	COST CODE 46007	3,672		42,882	26,304			0	0	199,522
	MBS 310121									1,315
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)									199,522

TOTAL MBS 310121 U-FARM GROUT PIPE		3,672		42,882	26,304			0	0	199,522

FLDOR DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING **
 LOCKEED MARTIN INTER. REM. ACTIONS-PERF CASING W/JRT PACK & GROUT
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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
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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	***** 241-A FARM- JET PACK CHARGE TO PERFORATE CASING *****	460	53 EA	0	0	0	0	0	0	0	0
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 WBS 320011 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	238,500	0	0	238,500

TOTAL WBS 320011	A-FARM PERFORATE WITH JET PACK			0	0	0	0	238,500	0	0	238,500

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FLOOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** TEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	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 0 208,000											

TOTAL COST CODE 46007											
WBS 320021											
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											

TOTAL WBS 320021 AX-FARM PERFORATE WITH JET PACK											
0 0 0 0 208,000 0 208,000											

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
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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	192,000	0	0	192,000
TOTAL COST CODE 46007					0	0	0	192,000	0	0	192,000
WBS 320031					0	0	0	0	0	0	192,000
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 320031 B-FARM PERFORATE WITH JET PACK					0	0	0	192,000	0	0	192,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
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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	***** 241-BY FARM- JET PACK CHARGE TO PERFORATE CASING *****	460	71 EA	0	0	0	0	0	0	0	0
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 WBS 320051 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	284,000	0	0	284,000

TOTAL WBS 320051	BY-FARM PERFORATE WITH JET PACK			0	0	0	0	284,000	0	0	284,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	ON&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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-SX FARM- JET PACK CHARGE TO PERFORATE CASING *****	460	105 EA	0	0	0	0	0	0	0	0
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 WBS 320081 (ESCALATION 0.00% - CONTINGENCY 30.00 %)				0	0	0	0	420,000	0	0	420,000
TOTAL WBS 320081 SX-FARM PERFORATE WITH JET PACK				0	0	0	0	420,000	0	0	420,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
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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 (ESCALATION 0.00% - 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

II-E-102

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - 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
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 (ESCALATION 0.00% - 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

II-E-103

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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 DATE 08/09/99 13:46:22
 BY KLR/DLG

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	***** 241-U FARM- JET PACK CHARGE TO PERFORATE CASING *****	460	60 EA	0	0	0	0	0	0	0	0
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 WBS 320121 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	240,000	0	0	240,000

TOTAL WBS 320121	U-FARM PERFORATE WITH JET PACK			0	0	0	0	240,000	0	0	240,000

II-E-104

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 27
 DATE 08/09/99 13:46:22
 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 (LMHC)										
500000.99	OTHER COST AND FEES										
500000.990102	DESIGN 30% OF TOTAL CONSTRUCTION COSTS	900	1 LS	0	0	0	0	1794000	0	0	1794000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	1,794,000	0	0	1,794,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	1,794,000	0	0	1,794,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	1,794,000	0	0	1,794,000

II-E-105

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAK1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-PERF CASING W/JET PACK & GROUT
 ORDER OF MAGNITUDE
 PHMCR00 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 28
 DATE 08/09/99 13:46:22
 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				54,852	2,270,051	555,474	341,036	5,188,500	0	17,052	8,372,115

II-E-106

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 8
 DATE 08/10/99 07:16:35
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST	%	CONTINGENCY TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	14,180,000	30	4,250,000	18,430,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	3,180,000	0	0	3,180,000
SUBTOTAL		17,360,000	24	4,250,000	21,610,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE \$100.4)	3,530,000	30	1,060,000	4,590,000
PROJECT TOTAL		20,890,000	25	5,310,000	26,200,000

II-E-107

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/10/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	
PROJECT MANAGER	<i>[Signature]</i>		
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR DANIEL NORTHWEST, INC.
 LOCHNER MARTIN
 JOB NO. 2696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 2 OF 8
 DATE 08/10/99 07:16:42
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
111100	DEFINITIVE DESIGN	530694	0.00	0	530694	30	159208	689902	160402	850304
	SUBTOTAL 11 DEFINITIVE DESIGN	530694	0.00	0	530694	30	159208	689902	160402	850304
121100	ENGINEERING DURING CONSTRUCTION	530694	0.00	0	530694	30	159208	689902	160402	850304
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	530694	0.00	0	530694	30	159208	689902	160402	850304
310011	A-FARM REMOVE INNER CASE THEN GROUT	942877	0.00	0	942877	30	282863	1225740	308189	1533930
310021	AXFARM REMOVE INNER CASE THEN GROUT	622322	0.00	0	622322	30	186696	809018	204971	1013990
310031	B-FARM REMOVE INNER CASE THEN GROUT	773320	0.00	0	773320	30	231996	1005316	251253	1256570
310041	BXFARM REMOVE INNER CASE THEN GROUT	1132765	0.00	0	1132765	30	339829	1472595	372243	1844838
310051	BYFARM REMOVE INNER CASE THEN GROUT	962155	0.00	0	962155	30	288646	1250802	316956	1567758
310061	C-FARM REMOVE INNER CASE THEN GROUT	1033402	0.00	0	1033402	30	310020	1343422	336966	1680389
310071	S-FARM REMOVE INNER CASE THEN GROUT	1064765	0.00	0	1064765	30	319429	1384195	350767	1734963
310081	SXFARM REMOVE INNER CASE THEN GROUT	1388641	0.00	0	1388641	30	416592	1805233	457499	2262732
310091	T-FARM REMOVE INNER CASE THEN GROUT	2532812	0.00	0	2532812	30	759843	3292656	797349	4090005
310101	TXFARM REMOVE INNER CASE THEN GROUT	1289825	0.00	0	1289825	30	386947	1676772	424443	2101215
310111	TYFARM REMOVE INNER CASE THEN GROUT	409840	0.00	0	409840	30	122952	532792	134946	667738
310121	U-FARM REMOVE INNER CASE THEN GROUT	966218	0.00	0	966218	30	289865	1256083	315816	1571900
	SUBTOTAL 31 CONSTRUCTION FORCES	13118947	0.00	0	13118947	30	3935684	17054631	4271403	21326034
500000	OPERATING CONTRACTOR (LMHC)	3184000	0.00	0	3184000	0	0	3184000	0	3184000
PROJECT TOTAL		17,364,335	0.00	0	17,364,335	24	4,254,100	21,618,435	4,592,208	26,210,643

II-E-108

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 FDNW PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST DATED 6/15/99
C. WORK SCOPE NOT INCLUDED IN THIS ESTIMATE: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW 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 23.6% 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 3.2% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 7% 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 DYNACORP.

C. RATES:

- (1) FOR ESTIMATING PURPOSES, AVERAGE FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR DANIEL NORTHWEST 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.

D. SITE ALLOCATIONS FACTORS:

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

- (1) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGT. RATE (23.0%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
- (3) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 23.00%
- (4) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION

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NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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. ROUNDING

=====

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

7. 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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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 DATE 08/10/99 07:16:49
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS

PDNW	FLUOR DANIEL NORTHWEST							
111100	DEFINITIVE DESIGN	530694	0.00	0	30	159208	160402	850304
	SUBTOTAL 11 DEFINITIVE DESIGN	530694	0.00	0	30	159208	160402	850304
121100	ENGINEERING DURING CONSTRUCTION	530694	0.00	0	30	159208	160402	850304
	SUBTOTAL 12 ENGINEERING DURING CONS	530694	0.00	0	30	159208	160402	850304
310011	A-FARM REMOVE INNER CASE THEN GR	942877	0.00	0	30	282863	308189	1533930
310021	AXFARM REMOVE INNER CASE THEN GR	622322	0.00	0	30	186696	204971	1013990
310031	B-FARM REMOVE INNER CASE THEN GR	773320	0.00	0	30	231996	251253	1256570
310041	BXFARM REMOVE INNER CASE THEN GR	1132765	0.00	0	30	339829	372243	1844838
310051	BYFARM REMOVE INNER CASE THEN GR	962155	0.00	0	30	288646	316956	1567758
310061	C-FARM REMOVE INNER CASE THEN GR	1033402	0.00	0	30	310020	336966	1680389
310071	S-FARM REMOVE INNER CASE THEN GR	1064765	0.00	0	30	319429	350767	1734963
310081	SXFARM REMOVE INNER CASE THEN GR	1388641	0.00	0	30	416592	457499	2262732
310091	T-FARM REMOVE INNER CASE THEN GR	2532812	0.00	0	30	759843	797349	4090005
310101	TXFARM REMOVE INNER CASE THEN GR	1289825	0.00	0	30	386947	424443	2101215
310111	TYFARM REMOVE INNER CASE THEN GR	409840	0.00	0	30	122952	134946	667738
310121	U-FARM REMOVE INNER CASE THEN GR	966218	0.00	0	30	289865	315816	1571900
	SUBTOTAL 31 CONSTRUCTION FORCES	13118947	0.00	0	30	3935684	4271403	21326034
	TOTAL PDNW FLUOR DANIEL NORTHWEST	14180335	0.00	0	30	4254100	4592208	23026643
LMHC	LOCHEED MARTIN HANFORD CORP.							
500000	OPERATING CONTRACTOR (LMHC)	3184000	0.00	0	0	0	0	3184000
	TOTAL LMHC LOCHEED MARTIN HANFORD CORP	3184000	0.00	0	0	0	0	3184000

PROJECT TOTAL		17,364,335	0.00	0	24	4,254,100	4,592,208	26,210,643

II-E-111

FLUOR DANIEL NORTHWEST, INC.
 LOCHHEAD MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 6 OF 8
 DATE 08/10/99 07:16:56
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION %	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
111100	DEFINITIVE DESIGN	530694	0.00	0	0	0	530694
	SUBTOTAL 11 DEFINITIVE DESIGN	530694		0	0	0	530694
121100	ENGINEERING DURING CONSTRUCTION	530694	0.00	0	0	0	530694
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	1061388		0	0	0	1061388
310011	A-FARM REMOVE INNER CASE THEN GROUT	762846	23.60	180031	0	180031	942877
310021	AXFARM REMOVE INNER CASE THEN GROUT	503497	23.60	118825	0	118825	622322
310031	B-FARM REMOVE INNER CASE THEN GROUT	625664	23.60	147656	0	147656	773320
310041	BXFARM REMOVE INNER CASE THEN GROUT	916477	23.60	216288	0	216288	1132765
310051	BYFARM REMOVE INNER CASE THEN GROUT	778443	23.60	183712	0	183712	962155
310061	C-FARM REMOVE INNER CASE THEN GROUT	836086	23.60	197316	0	197316	1033402
310071	S-FARM REMOVE INNER CASE THEN GROUT	861461	23.60	203304	0	203304	1064765
310081	SXFARM REMOVE INNER CASE THEN GROUT	1123496	23.60	265145	0	265145	1388641
310091	T-FARM REMOVE INNER CASE THEN GROUT	2049201	23.60	483611	0	483611	2532812
310101	TXFARM REMOVE INNER CASE THEN GROUT	1043548	23.60	246277	0	246277	1289825
310111	TYFARM REMOVE INNER CASE THEN GROUT	331586	23.60	78254	0	78254	409840
310121	U-FARM REMOVE INNER CASE THEN GROUT	781730	23.60	184488	0	184488	966218
	SUBTOTAL 31 CONSTRUCTION FORCES	10614035		2504912	0	2504912	13118947
500000	OPERATING CONTRACTOR (LMHC)	3184000	0.00	0	0	0	3184000
PROJECT TOTAL		14,859,423		2,504,912	0	2,504,912	17,364,335

II-E-112

FLUOR DANIEL NORTHWEST, INC.
 LOCHRED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 DATE 08/10/99 07:17:26
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GFS/G&A CONST.MGMT	FDH MPR F.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	530694	1326	0	0	122059	0	123386
	SUBTOTAL 11 DEFINITIVE DESIGN	530694	1326	0	0	122059	0	123386
121100	ENGINEERING DURING CONSTRUCTION	530694	1326	0	0	122059	0	123386
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	530694	1326	0	0	122059	0	123386
310011	A-FARM REMOVE INNER CASE THEN GROUT	762846	54813	41407	0	126070	14778	237069
310021	AXFARM REMOVE INNER CASE THEN GROUT	503497	37471	27329	0	86184	6684	157670
310031	B-FARM REMOVE INNER CASE THEN GROUT	625664	44627	33961	0	102642	12040	193271
310041	BXFARM REMOVE INNER CASE THEN GROUT	916477	67076	49746	0	154274	15243	286340
310051	BYFARM REMOVE INNER CASE THEN GROUT	778443	57941	42253	0	133265	10351	243812
310061	C-FARM REMOVE INNER CASE THEN GROUT	836086	60295	45382	0	138679	14846	259204
310071	S-FARM REMOVE INNER CASE THEN GROUT	861461	64121	46760	0	147480	11459	269821
310081	SXFARM REMOVE INNER CASE THEN GROUT	1123496	83631	60983	0	192353	14953	351922
310091	T-FARM REMOVE INNER CASE THEN GROUT	2049201	121234	111230	0	278840	102039	613345
310101	TXFARM REMOVE INNER CASE THEN GROUT	1043548	77403	56643	0	178027	14419	326494
310111	TYFARM REMOVE INNER CASE THEN GROUT	331586	24671	17998	0	56743	4391	103805
310121	U-FARM REMOVE INNER CASE THEN GROUT	781730	56802	42432	0	130644	13057	242936
	SUBTOTAL 31 CONSTRUCTION FORCES	10614035	750090	576129	0	1725208	234266	3285694
500000	OPERATING CONTRACTOR (LMHC)	3184000	0	0	0	0	0	0
PROJECT TOTAL		14,859,423	752,743	576,129	0	1,969,327	234,266	3,532,467

I-E-113

FLUOR DANIEL NORTHWEST, INC.
 LOCHBEE MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL		%	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	123386		0.00	0	123386	30	37015	160402
	SUBTOTAL 11 DEFINITIVE DESIGN	123386		0.00	0	123386	30	37015	160402
121100	ENGINEERING DURING CONSTRUCTION	123386		0.00	0	123386	30	37015	160402
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	123386		0.00	0	123386	30	37015	160402
310011	A-FARM REMOVE INNER CASE THEN GROUT	237069		0.00	0	237069	30	71120	308189
310021	AXFARM REMOVE INNER CASE THEN GROUT	157670		0.00	0	157670	30	47301	204971
310031	B-FARM REMOVE INNER CASE THEN GROUT	193271		0.00	0	193271	30	57981	251253
310041	BXFARM REMOVE INNER CASE THEN GROUT	286340		0.00	0	286340	30	85902	372243
310051	BYFARM REMOVE INNER CASE THEN GROUT	243812		0.00	0	243812	30	73143	316956
310061	C-FARM REMOVE INNER CASE THEN GROUT	259204		0.00	0	259204	30	77761	336966
310071	S-FARM REMOVE INNER CASE THEN GROUT	269821		0.00	0	269821	30	80946	350767
310081	SXFARM REMOVE INNER CASE THEN GROUT	351922		0.00	0	351922	30	105576	457499
310091	T-FARM REMOVE INNER CASE THEN GROUT	613345		0.00	0	613345	30	184003	797349
310101	TXFARM REMOVE INNER CASE THEN GROUT	326494		0.00	0	326494	30	97948	424443
310111	TYPARM REMOVE INNER CASE THEN GROUT	103805		0.00	0	103805	30	31141	134946
310121	U-FARM REMOVE INNER CASE THEN GROUT	242936		0.00	0	242936	30	72880	315816
	SUBTOTAL 31 CONSTRUCTION FORCES	3285694		0.00	0	3285694	30	985708	4271403
500000	OPERATING CONTRACTOR (LMHC)	0		0.00	0	0	0	0	0
PROJECT TOTAL		3,532,467		0.00	0	3,532,467	30	1,059,740	4,592,208

II-E-114

FLUOR DANIEL NORTHWEST, INC.
 LOCHREED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY WBS / COST CODE

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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	6464 MHR	6464	530694	0	0	0	0	0	530694
	5% OF TOTAL CONSTRUCTION COSTS SINCE NO REAL DESIGN BUT DECOMMISSIONING WELLS										

SUBTOTAL	HOME OFFICE LABOR			6,464		0	0	0		0	
					530,694		0		0		530,694

TOTAL	COST CODE 00090			6,464		0	0	0		0	
	WBS 111100				530,694		0		0		530,694
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 111100	DEFINITIVE DESIGN			6,464		0	0	0		0	
					530,694		0		0		530,694

II-E-115

FLUOR DANIEL NORTHWEST, INC.
 LOCHNEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 5% OF TOTAL CONSTRUCTION LABOR COSTS.	000	6464	MHR	6464	530694	0	0	0	0	530694
SUBTOTAL HOME OFFICE LABOR					6,464	530,694	0	0	0	0	530,694
TOTAL COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)					6,464	530,694	0	0	0	0	530,694
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION					6,464	530,694	0	0	0	0	530,694

II-E-116

FLUOR DANIEL NORTHWEST, INC.
 LOCHNER MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 LP	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	9608	12000	120	0	0	6	21734
310011.0700006	3 LABORERS	460	4 EA	256	8059	0	0	0	0	0	8059
310011.0700008	1 TEAMSTER	460	4 EA	96	3614	0	0	0	0	0	3614
310011.0700010	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LP WILL FILL 1/2 BOX BY WEIGHT. *****	460	404 LP	0	0	0	0	0	0	0	0
310011.0700012	\$70/CP DISPOSAL x 64 CP= \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	404 LP	0	0	0	20200	0	0	1010	21210
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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	6873 LP	4949	185736	137460	22681	0	0	1134	347011
310011.0701104	ASSUME SINGLE CASING 3 LABORERS	460	6873 LP	4949	155795	0	0	0	0	0	155795
310011.0701106	1 TEAMSTER	460	6873 LP	1650	62123	0	0	0	0	0	62123
SUBTOTAL SITE IMPROVEMENTS				12,212	426,893	150,460		0		2,150	
CONSUMABLES 3.20 %							43,001		0		622,504
GENERAL FOREMAN 7.00 %				854	29882		13660				13660
											29882

H-E-117

FLUOR DANIEL NORTHWEST, INC.
 LOCHREED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		2613	91355						91355
	SALES TAX	8.00 %					4532		0		4532
	OH&P (ON MARKUPS ONLY)									909	909
TOTAL	COST CODE 46007			15,680		150,460		0		3,059	
	WBS 310011				548,130		61,194		0		762,844
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310011	A-FARM REMOVE INNER CASE THEN GROUT			15,680		150,460		0		3,059	
					548,130		61,194		0		762,844

II-E-118

FLUOR DANIEL NORTHWEST, INC.
 LOCHREED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 LP	0	0	0	0	0	0	0	0
310021.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME \$.3/LP FOR BLADES CUT AND PULL INNER CASING	460	0 LP	0	0	0	0	0	0	0	0
310021.0700006	3 LABORERS	460	0 LP	0	0	0	0	0	0	0	0
310021.0700008	1 TEAMSTER	460	0 LP	0	0	0	0	0	0	0	0
310021.0700010	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LP WILL FILL 1/2 BOX BY WEIGHT.	460	0 LP	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 LP	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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	4936 LP	3554	133382	98720	16289	0	0	814	249205
310021.0701104	ASSUME SINGLE CASING 3 LABORERS	460	4936 LP	3554	111880	0	0	0	0	0	111880
310021.0701106	1 TEAMSTER	460	4936 LP	1185	44615	0	0	0	0	0	44615
SUBTOTAL SITE IMPROVEMENTS				8,349		99,720		0		814	
	CONSUMABLES 3.20 %				291,835		16,289		0		408,658
	GENERAL FOREMAN 7.00 %			584	20428		9338				9338
											20428

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FLUOR DANIEL NORTHWEST, INC.
 LOCHREED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		1786	62452						62452
	SALES TAX	8.00 %					2050		0		2050
	OH&P (ON MARKUPS ONLY)									569	569
TOTAL	COST CODE 46007			10,720		99,720		0		1,383	
	WBS 310021				374,716		27,677		0		503,497
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310021	AXFARM REMOVE INNER CASE THEN GROUT			10,720		99,720		0		1,383	
					374,716		27,677		0		503,497

II-E-120

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY WBS / COST CODE

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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	11	38034
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	875	18375
310031.0701002	***** 241-B FARM- PERP 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	867	265140
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		1,753	
	CONSUMABLES 3.20 %				347,565		35,042		0		511,400
	GENERAL FOREMAN 7.00 %			695	24329		11122				11122
											24329

H-E-121

FLUOR DANIEL NORTHWEST, INC.
 LOCHSEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 †		2127	74378						74378
	SALES TAX	8.00 †					3693		0		3693
	OH&P (ON MARKUPS ONLY)									740	740
TOTAL	COST CODE 46007			12,765		127,040		0		2,493	
	WBS 310031				446,273		49,857		0		625,664
	(ESCALATION 0.00% - CONTINGENCY 30.00 †)										
TOTAL WBS 310031	B-FARM REMOVE INNER CASE THEN GROUT			12,765		127,040		0		2,493	
					446,273		49,857		0		625,664

II-E-122

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310041	BXPARM 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	2	5434
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. \$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	638	13388
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/100LP	460	8772 LF	6316	237039	175440	28948	0	0	1447	442874
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	522,399	179,440	41,728	0	0	2,087	745,654
	CONSUMABLES 3.20 †						16716				16716
	GENERAL FOREMAN 7.00 †			1046	36567						36567

II-E-123

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 †		3198	111793						111793
	SALES TAX	8.00 †					4675		0		4675
	OH&P (ON MARKUPS ONLY)									1069	1069

TOTAL	COST CODE 46007			19,189		179,440		0		3,156	
	WBS 310041				670,760		63,120		0		916,477
	(ESCALATION 0.00% - CONTINGENCY 30.00 †)										

TOTAL	WBS 310041 BXPARM REMOVE INNER CASE THEN GROUT			19,189		179,440		0		3,156	
					670,760		63,120		0		916,477

II-E-124

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERFORM OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY MBS / COST CODE

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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 LP	0	0	0	0	0	0	0	0
310051.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME \$30/LP FOR BLADES CUT AND PULL INNER CASING	460	0 EA	0	0	0	0	0	0	0	0
310051.0700006	3 LABORERS	460	0 LP	0	0	0	0	0	0	0	0
310051.0700008	1 TEAMSTER	460	0 LP	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 LP	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 LP	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/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	7651 LP	5509	206753	153020	25248	0	0	1262	386283
310051.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7651 LP	5509	173423	0	0	0	0	0	173423
310051.0701106	1 TEAMSTER	460	7651 LP	1836	69125	0	0	0	0	0	69125
SUBTOTAL SITE IMPROVEMENTS				12,910	451,259	154,020	25,248	0	0	1,262	631,789
CONSUMABLES 3.20 %							14440				14440
GENERAL FOREMAN 7.00 %				903	31588						31588

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FLUOR DANIEL NORTHWEST, INC.
 LOCHSIED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 †		2762	96569						96569
	SALES TAX	8.00 †					3175		0		3175
	OH&P (ON MARKUPS ONLY)									880	880
TOTAL	COST CODE 46007			16,576		154,020		0		2,142	
	WBS 310051				579,416		42,863		0		778,442
	(ESCALATION 0.00% - CONTINGENCY 30.00 †)										
TOTAL WBS 310051	BYFARM REMOVE INNER CASE THEN GROUT			16,576		154,020		0		2,142	
					579,416		42,863		0		778,442

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** BEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

FLUOR DANIEL NORTHWEST, INC.
 LOCHESD MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

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										
310061.0700002	SITE IMPROVEMENTS	460	350 LF	0	0	0	0	0	0	0	0
310061.0700004	241-C FARM-CUT INNER CASING AND REMOVE INNER CASING	460	7 EA	448	16813	21000	210	0	0	11	38034
310061.0700006	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE	460	7 EA	448	14103	0	0	0	0	0	14103
310061.0700008	CUT AND PULL INNER CASING 3 LABORERS	460	7 EA	168	6325	0	0	0	0	0	6325
310061.0700010	1 TEAMSTER ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LP WILL	460	350 LP	0	0	0	0	0	0	0	0
310061.0700012	FILL 1/2 BOX BY WEIGHT. \$70/CF DISPOSAL X 64 CF= \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING	460	350 LP	0	0	0	17500	0	0	875	18375
310061.0701002	241-C FARM- PERP 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	460	7329 LF	5277	198046	146580	24186	0	0	1209	370021
310061.0701104	ASSUME GROUT 3 CY/100LP 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											
13,433 469,591 168,580 0 2,095											
CONSUMABLES 3.20 \$ 41,896 682,162											
GENERAL FOREMAN 7.00 \$ 15026 15026											
940 32871 32871											

FLUOR DANIEL NORTHWEST, INC.
 LOCHREED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		2874	100492						100492
	SALES TAX	8.00 %					4553		0		4553
	OH&P (ON MARKUPS ONLY)									979	979
TOTAL	COST CODE 46007			17,247		168,580		0		3,074	
	WBS 310061				602,954		61,476		0		836,085
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310061	C-FARM REMOVE INNER CASE THEN GROUT			17,247		168,580		0		3,074	
					602,954		61,476		0		836,085

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR06 - ESTIMATE DETAIL BY WBS / COST CODE

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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 LP	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 LP WILL FILL 1/2 BOX BY WEIGHT.	460	0 LP	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 LP	0	0	0	0	0	0	0	0
310071.0701002	***** 241-S FARM- PERP 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/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	8471 LP	6099	228895	169420	27954	0	0	1398	427667
310071.0701104	ASSUME SINGLE CASING 3 LABORERS	460	8471 LP	6099	191997	0	0	0	0	0	191997
310071.0701106	1 TEAMSTER	460	8471 LP	2033	76542	0	0	0	0	0	76542

SUBTOTAL	SITE IMPROVEMENTS			14,287		170,420		0		1,398	
	CONSUMABLES 3.20 %				499,392		27,954		0		699,164
	GENERAL FOREMAN 7.00 %			1000	34957		15980				15980
											34957

II-E-129

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		3057	106869						106869
	SALES TAX	8.00 %					3514		0		3514
	OH&P (ON MARKUPS ONLY)									974	974
<hr/>											
TOTAL	COST CODE 46007			18,344		170,420		0		2,372	
	WBS 310071				641,219		47,449		0		861,461
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
<hr/>											
TOTAL	WBS 310071 S-PARM REMOVE INNER CASE THEN GROUT			18,344		170,420		0		2,372	861,461
					641,219		47,449		0		

II-E-130

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310081	SXPARM REMOVE INNER CASE THEN GROUT										
310081.07	SITE IMPROVEMENTS										
310081.0700002	***** 241-SX FARM-CUT INNER CASING AND REMOVE INNER CASING *****	460	0 LP	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 LP WILL FILL 1/2 BOX BY WEIGHT. \$70/CF DISPOSAL x 64 CF= \$4480. ASSUME \$520 FOR COST OF BURIAL BOX AND SHIPPING *****	460	0 LP	0	0	0	0	0	0	0	0
310081.0701002	***** 241-SX FARM- PERP 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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	11058 LP	7962	298814	221160	36491	0	0	1825	558290
310081.0701104	ASSUME SINGLE CASING 3 LABORERS	460	11058 LP	7962	250644	0	0	0	0	0	250644
310081.0701106	1 TEAMSTER	460	11058 LP	2654	99923	0	0	0	0	0	99923
SUBTOTAL SITE IMPROVEMENTS				18,634		222,160		0		1,825	
	CONSUMABLES 3.20 %				651,339		36,491		0		911,815
	GENERAL FOREMAN 7.00 %			1304	45593		20842				20842
											45593

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FLUOR DANIEL NORTHWEST, INC.
 LOCHIED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		3987	139386						139386
	SALES TAX	8.00 %					4586		0		4586
	OH&P (ON MARKUPS ONLY)									1271	1271
TOTAL	COST CODE 46007			23,926		222,160		0		3,096	
	WBS 310081				836,319		61,920		0		1,123,496
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310081	SXPARM.REMOVE INNER CASE THEN GROUT			23,926		222,160		0		3,096	
					836,319		61,920		0		1,123,496

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FLUOR DANIEL NORTHWEST, INC.
 LOCHRED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 LP	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	90	326005
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 LP WILL FILL 1/2 BOX BY WEIGHT. *****	460	6484 LP	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 LP	0	0	0	324200	0	0	16210	340410
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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	10610 LP	7639	286692	212200	35013	0	0	1751	535656
310091.0701104	ASSUME SINGLE CASING 3 LABORERS	460	10610 LP	7639	240476	0	0	0	0	0	240476
310091.0701106	1 TEAMSTER	460	10610 LP	2546	95857	0	0	0	0	0	95857
SUBTOTAL SITE IMPROVEMENTS				27,000		393,200		0		18,051	
	CONSUMABLES 3.20 %				944,197		361,013		0		1,716,461
	GENERAL FOREMAN 7.00 %			1890	66093		30214				30214
											66093

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		5778	202058						202058
	SALES TAX	8.00 %					31298		0		31298
	OH&P (ON MARKUPS ONLY)									3075	3075
TOTAL	COST CODE 46007			34,668		393,200		0		21,126	
	WBS 310091				1,212,348		422,525		0		2,049,201
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310091	T-FARM REMOVE INNER CASE THEN GROUT			34,668		393,200		0		21,126	
					1,212,348		422,525		0		2,049,201

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	2	5434
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 WRIGHT.	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	125	2625
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	1673	512002
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		206,820		0		1,800	
CONSUMABLES 3.20 %					602,830		35,995		0		847,445
GENERAL FOREMAN 7.00 %				1207	42198		19290				42198

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FLUOR DANIEL NORTHWEST, INC.
 LOCHNEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 %		3690	129005						129005
	SALES TAX	8.00 %					4422		0		4422
	OH&P (ON MARKUPS ONLY)									1185	1185
TOTAL	COST CODE 46007			22,143		206,820		0		2,985	
	WBS 310101				774,033		59,708		0		1,043,547
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL	WBS 310101 TXFARM REMOVE INNER CASE THEN GROUT			22,143		206,820		0		2,985	
					774,033		59,708		0		1,043,547

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FLUOR DANIEL NORTHWEST, INC.
 LOCHIED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

**** IEST - INTERACTIVE ESTIMATING ****
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
310111	TYPARM REMOVE INNER CASE THEN GROUT										
310111.07	SITE IMPROVEMENTS										
310111.0700002	***** 241-TY FARM-CUT INNER CASING AND REMOVE INNER CASING *****	460	0 LP	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 LP WILL FILL 1/2 BOX BY WEIGHT.	460	0 LP	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 LP	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/LP FOR BLADES ASSUME GROUT 3 CY/100LP	460	3239 LP	2332	87520	64780	10689	0	0	534	163523
310111.0701104	ASSUME SINGLE CASING 3 LABORERS	460	3239 LP	2332	73411	0	0	0	0	0	73411
310111.0701106	1 TEAMSTER	460	3239 LP	777	29254	0	0	0	0	0	29254

SUBTOTAL	SITE IMPROVEMENTS			5,497		65,780		0		534	
	CONSUMABLES 3.20 %				192,143		10,689		0		269,146
	GENERAL FOREMAN 7.00 %			384	13450		6148				6148
											13450

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FLUOR DANIEL NORTHWEST, INC.
 LOCHBED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCRO8 - 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
	GENERAL REQUIREMENTS	20.00 %		1176	41118						41118
	SALES TAX	8.00 %					1347		0		1347
	OH&P (ON MARKUPS ONLY)									374	374
TOTAL	COST CODE 46007			7,058		65,780		0		908	
	WBS 310111				246,711		18,184		0		331,584
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310111	TYFARM REMOVE INNER CASE THEN GROUT			7,058		65,780		0		908	
					246,711		18,184		0		331,584

II-E-138

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - 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
310121	U-FARM REMOVE INNER CASE THEN GROUT										
310121.07	SITE IMPROVEMENTS										
310121.0700002	***** 241-U FARM-CUT INNER CASING AND REMOVE INNER CASING *****	460	250 LF	0	0	0	0	0	0	0	0
310121.0700004	3 OPERATORS, DRILL RIG, CASING JACKS, CRANE ASSUME \$30/LP FOR BLADES CUT AND PULL INNER CASING	460	5 EA	320	12010	15000	150	0	0	8	27168
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	***** ASSUME DISPOSE OF PIPE AS MIXED WASTE. 100 LF WILL FILL 1/2 BOX BY WEIGHT.	460	250 LF	0	0	0	0	0	0	0	0
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	625	13125
310121.0701002	***** 241-U FARM- PERF 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, ASSUME 2 CUTS EVERY 6" ASSUME \$.3/LP FOR BLADES ASSUME GROUT 3 CY/100LF	460	7047 LF	5074	190427	140940	23255	0	0	1163	355785
310121.0701104	ASSUME SINGLE CASING 3 LABORERS	460	7047 LF	5074	159730	0	0	0	0	0	159730
310121.0701106	1 TEAMSTER	460	7047 LF	1691	63666	0	0	0	0	0	63666
SUBTOTAL SITE IMPROVEMENTS				12,655		156,940		0		1,796	
CONSUMABLES 3.20 %					442,383		35,905		0		637,024
GENERAL FOREMAN 7.00 %				885	30966		14156				14156
											30966

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RPP-5002, Rev. 0

FLUOR DANIEL NORTHWEST, INC.
 LOCHNEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCRO8 - 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
	GENERAL REQUIREMENTS	20.00 %		2708	94669						94669
	SALES TAX	8.00 %					4004		0		4004
	OH&P (ON MARKUPS ONLY)									908	908
TOTAL	COST CODE 46007			16,249		156,940		0		2,704	
	WBS 310121				568,019		54,066		0		781,729
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121	U-FARM REMOVE INNER CASE THEN GROUT			16,249		156,940		0		2,704	
					568,019		54,066		0		781,729

FLUOR DANIEL NORTHWEST, INC.
 LOCHNEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS(CUT & REMOVE INNER CASING,
 PERP. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - 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
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION LABOR COSTS.	900	1 LS	0	0	0	0	3184000	0	0	3184000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	3,184,000	0	0	3,184,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 0.00%)			0	0	0	0	3,184,000	0	0	3,184,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	3,184,000	0	0	3,184,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCHKEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAM1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (CUT & REMOVE INNER CASING,
 PERF. OUTER CASING & GROUT) ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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 DATE 08/10/99 07:17:11
 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				227,497	8,562,292	2,094,580	970,044	3,184,000	0	48,504	14,859,421

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

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 DATE 08/09/99 15:35:21
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	1,060,000	30	320,000	1,380,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	170,000	30	50,000	220,000
SUBTOTAL		1,230,000	30	370,000	1,600,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	330,000	30	100,000	430,000
PROJECT TOTAL		1,560,000	30	470,000	2,030,000

II-E-143

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/9/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	
PROJECT MANAGER	<i>[Signature]</i>		
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

FLUOR DANIEL NORTHWEST, INC.
 LOCHKEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 2 OF 8
 DATE 08/09/99 15:35:28
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
111100	DEFINITIVE DESIGN	57470	0.00	0	57470	30	17241	74711	17370	92081
	SUBTOTAL 11	57470	0.00	0	57470	30	17241	74711	17370	92081
121100	ENGINEERING DURING CONSTRUCTION	28735	0.00	0	28735	30	8620	37355	8685	46040
	SUBTOTAL 12	28735	0.00	0	28735	30	8620	37355	8685	46040
310011	A-FARM EXTEND CASING AND GROUT PAD	61630	0.00	0	61630	30	18489	80119	22692	102812
310021	AX-FARM EXTEND CASING AND GROUT PAD	67287	0.00	0	67287	30	20186	87474	25000	112474
310031	B-FARM EXTEND CASING AND GROUT PAD	56043	0.00	0	56043	30	16813	72857	20638	93496
310041	BX-FARM EXTEND CASING AND GROUT PAD	94028	0.00	0	94028	30	28208	122237	34600	156838
310051	BY-FARM EXTEND CASING AND GROUT PAD	81739	0.00	0	81739	30	24521	106260	30083	136344
310061	C-FARM EXTEND CASING AND GROUT PAD	80624	0.00	0	80624	30	24187	104811	29673	134485
310071	S-FARM EXTEND CASING AND GROUT PAD	84651	0.00	0	84651	30	25395	110046	31176	141223
310081	SX-FARM EXTEND CASING AND GROUT PAD	120404	0.00	0	120404	30	36121	156526	44318	200845
310091	T-FARM EXTEND CASING AND GROUT PAD	108554	0.00	0	108554	30	32566	141120	39939	181060
310101	TX-FARM EXTEND CASING AND GROUT PAD	116373	0.00	0	116373	30	34911	151285	42813	194099
310111	TY-FARM EXTEND CASING AND GROUT PAD	37050	0.00	0	37050	30	11115	48165	13657	61822
310121	U-FARM EXTEND CASING AND GROUT PAD	69449	0.00	0	69449	30	20834	90284	25566	115850
	SUBTOTAL 31	977837	0.00	0	977837	30	293351	1271189	360163	1631353
500000	OPERATING CONTRACTOR (LMHC)	172000	0.00	0	172000	30	51600	223600	42707	266307
PROJECT TOTAL		1,236,042	0.00	0	1,236,042	30	370,812	1,606,855	428,926	2,035,782

II-E-144

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. Z696
FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS-EXTEND CASING AND GROUT PAD
ORDER OF MAGNITUDE
PHMCR03 - ESTIMATE BASIS SHEET

PAGE 3 OF 8
DATE 07/22/99 07:34:56
BY KLR/DLG

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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC PROJECT MANAGEMENT.
D. THIS ESTIMATE ALSO UTILIZES A STANDARD FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW 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 23.6% 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 3.2% OF DIRECT CRAFT LABOR COSTS.
(4) SPECIAL WORK PROCEDURES (SWP) FACTORS ARE INCLUDED IN THE PRODUCTION RATES ESTIMATED.
(5) GENERAL FOREMAN FACTOR OF 7% 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 DYNACORP.

C. RATES:

- (1) FOR ESTIMATING PURPOSES, AVERAGE FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.
(2) FLUOR DANIEL NORTHWEST 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.

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D. SITE ALLOCATIONS FACTORS:

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

- (1) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGT. RATE (23.0%) APPLIED TO CONSTRUCTION MANAGEMENT LABOR.
- (3) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENG. AND DIRECT CRAFT LABOR, 23.00%
- (4) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

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 CONSTRUCTION FORCES.

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

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. I696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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 DATE 08/09/99 15:35:35
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
FDNW FLUOR DANIEL NORTHWEST										
111100	DEFINITIVE DESIGN	57470	0.00	0	57470	30	17241	74711	17370	92081
	SUBTOTAL 11	57470	0.00	0	57470	30	17241	74711	17370	92081
121100	ENGINEERING DURING CONSTRUCTION	28735	0.00	0	28735	30	8620	37355	8685	46040
	SUBTOTAL 12	28735	0.00	0	28735	30	8620	37355	8685	46040
310011	A-FARM EXTEND CASING AND GROUT P	61630	0.00	0	61630	30	18489	80119	22692	102812
310021	AX-FARM EXTEND CASING AND GROUT	67287	0.00	0	67287	30	20186	87474	25000	112474
310031	B-FARM EXTEND CASING AND GROUT P	56043	0.00	0	56043	30	16813	72857	20638	93496
310041	BX-FARM EXTEND CASING AND GROUT	94028	0.00	0	94028	30	28208	122237	34600	156838
310051	BY-FARM EXTEND CASING AND GROUT	81739	0.00	0	81739	30	24521	106260	30083	136344
310061	C-FARM EXTEND CASING AND GROUT P	80624	0.00	0	80624	30	24187	104811	29673	134485
310071	S-FARM EXTEND CASING AND GROUT P	84651	0.00	0	84651	30	25395	110046	31176	141223
310081	SX-FARM EXTEND CASING AND GROUT	120404	0.00	0	120404	30	36121	156526	44318	200845
310091	T-FARM EXTEND CASING AND GROUT P	108554	0.00	0	108554	30	32566	141120	39939	181060
310101	TX-FARM EXTEND CASING AND GROUT	116373	0.00	0	116373	30	34911	151285	42813	194099
310111	TY-FARM EXTEND CASING AND GROUT	37050	0.00	0	37050	30	11115	48165	13657	61822
310121	U-FARM EXTEND CASING AND GROUT P	69449	0.00	0	69449	30	20834	90284	25566	115850
	SUBTOTAL 31	977837	0.00	0	977837	30	293351	1271189	360163	1631353
	TOTAL FDNW FLUOR DANIEL NORTHWEST	1064042	0.00	0	1064042	30	319212	1383255	386219	1769475
LMHC LOCHEED MARTIN HANFORD CORP.										
500000	OPERATING CONTRACTOR (LMHC)	172000	0.00	0	172000	30	51600	223600	42707	266307
	TOTAL LMHC LOCHEED MARTIN HANFORD CORP	172000	0.00	0	172000	30	51600	223600	42707	266307
PROJECT TOTAL		1,236,042	0.00	0	1,236,042	30	370,812	1,606,855	428,926	2,035,782

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FLUOR DANIEL NORTHWEST, INC.
 LOCHNERD MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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 DATE 08/09/99 15:35:42
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
111100	DEFINITIVE DESIGN	57470	0.00	0	0	0	57470
	SUBTOTAL 11 DEFINITIVE DESIGN	57470		0	0	0	57470
121100	ENGINEERING DURING CONSTRUCTION	28735	0.00	0	0	0	28735
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	86205		0	0	0	86205
310011	A-FARM EXTEND CASING AND GROUT PAD	49863	23.60	11767	0	11767	61630
310021	AX-FARM EXTEND CASING AND GROUT PAD	54440	23.60	12847	0	12847	67287
310031	B-FARM EXTEND CASING AND GROUT PAD	45343	23.60	10700	0	10700	56043
310041	BX-FARM EXTEND CASING AND GROUT PAD	76075	23.60	17953	0	17953	94028
310051	BY-FARM EXTEND CASING AND GROUT PAD	66132	23.60	15607	0	15607	81739
310061	C-FARM EXTEND CASING AND GROUT PAD	65230	23.60	15394	0	15394	80624
310071	S-FARM EXTEND CASING AND GROUT PAD	68488	23.60	16163	0	16163	84651
310081	SX-FARM EXTEND CASING AND GROUT PAD	97415	23.60	22989	0	22989	120404
310091	T-FARM EXTEND CASING AND GROUT PAD	87827	23.60	20727	0	20727	108554
310101	TX-FARM EXTEND CASING AND GROUT PAD	94153	23.60	22220	0	22220	116373
310111	TY-FARM EXTEND CASING AND GROUT PAD	29976	23.60	7074	0	7074	37050
310121	U-FARM EXTEND CASING AND GROUT PAD	56189	23.60	13260	0	13260	69449
	SUBTOTAL 31 CONSTRUCTION FORCES	791131		186706	0	186706	977837
500000	OPERATING CONTRACTOR (LMHC)	172000	0.00	0	0	0	172000
PROJECT TOTAL		1,049,336		186,706	0	186,706	1,236,042

I-E-148

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

**** IEST - INTERACTIVE ESTIMATING ****
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	PDH GFS/G&A CONST.MGMT	PDH MPR P.P./S.C.	PDH GFS/G&A LABOR	PDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	57470	143	0	0	13218	0	13361
	SUBTOTAL 11 DEFINITIVE DESIGN	57470	143	0	0	13218	0	13361
121100	ENGINEERING DURING CONSTRUCTION	28735	71	0	0	6609	0	6680
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	28735	71	0	0	6609	0	6680
310011	A-FARM EXTEND CASING AND GROUT PAD	49863	3766	2706	0	8663	2318	17455
310021	AX-FARM EXTEND CASING AND GROUT PAD	54440	4232	2955	0	9734	2309	19231
310031	B-FARM EXTEND CASING AND GROUT PAD	45343	3428	2461	0	7885	2100	15876
310041	BX-FARM EXTEND CASING AND GROUT PAD	76075	5729	4129	0	13177	3580	26616
310051	BY-FARM EXTEND CASING AND GROUT PAD	66132	4984	3589	0	11464	3102	23141
310061	C-FARM EXTEND CASING AND GROUT PAD	65230	4917	3540	0	11309	3059	22826
310071	S-FARM EXTEND CASING AND GROUT PAD	68488	5173	3717	0	11899	3192	23982
310081	SX-FARM EXTEND CASING AND GROUT PAD	97415	7339	5287	0	16879	4585	34091
310091	T-FARM EXTEND CASING AND GROUT PAD	87827	6608	4767	0	15200	4146	30723
310101	TX-FARM EXTEND CASING AND GROUT PAD	94153	7082	5110	0	16289	4450	32933
310111	TY-FARM EXTEND CASING AND GROUT PAD	29976	2278	1627	0	5239	1360	10505
310121	U-FARM EXTEND CASING AND GROUT PAD	56189	4240	3049	0	9753	2622	19666
	SUBTOTAL 31 CONSTRUCTION FORCES	791131	59781	42942	0	137497	36827	277049
500000	OPERATING CONTRACTOR (LMHC)	172000	0	0	32852	0	0	32852
PROJECT TOTAL		1,049,336	59,996	42,942	32,852	157,324	36,827	329,943

II-E-149

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB		CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL		%	TOTAL	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	13361		0.00	0	13361		30	4008	17370
	SUBTOTAL 11 DEFINITIVE DESIGN	13361		0.00	0	13361		30	4008	17370
121100	ENGINEERING DURING CONSTRUCTION	6680		0.00	0	6680		30	2004	8685
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	6680		0.00	0	6680		30	2004	8685
310011	A-FARM EXTEND CASING AND GROUT PAD	17455		0.00	0	17455		30	5236	22692
310021	AX-FARM EXTEND CASING AND GROUT PAD	19231		0.00	0	19231		30	5769	25000
J10031	B-FARM EXTEND CASING AND GROUT PAD	15876		0.00	0	15876		30	4762	20638
310041	BX-FARM EXTEND CASING AND GROUT PAD	26616		0.00	0	26616		30	7984	34600
310051	BY-FARM EXTEND CASING AND GROUT PAD	23141		0.00	0	23141		30	6942	30083
310061	C-FARM EXTEND CASING AND GROUT PAD	22826		0.00	0	22826		30	6847	29673
310071	S-FARM EXTEND CASING AND GROUT PAD	23982		0.00	0	23982		30	7194	31176
310081	SX-FARM EXTEND CASING AND GROUT PAD	34091		0.00	0	34091		30	10227	44318
310091	T-FARM EXTEND CASING AND GROUT PAD	30723		0.00	0	30723		30	9216	39939
310101	TX-FARM EXTEND CASING AND GROUT PAD	32933		0.00	0	32933		30	9880	42813
310111	TY-FARM EXTEND CASING AND GROUT PAD	10505		0.00	0	10505		30	3151	13657
310121	U-FARM EXTEND CASING AND GROUT PAD	19666		0.00	0	19666		30	5899	25566
	SUBTOTAL 31 CONSTRUCTION FORCES	277049		0.00	0	277049		30	83114	360163
500000	OPERATING CONTRACTOR (LMHC)	32852		0.00	0	32852		30	9855	42707
PROJECT TOTAL		329,943		0.00	0	329,943		30	98,983	428,926

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - 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	000	700 MHR	700	57470	0	0	0	0	0	57470
	10% OF TOTAL CONSTRUCTION LABOR COSTS										

SUBTOTAL	HOME OFFICE LABOR			700	57,470	0	0	0	0	0	57,470

TOTAL	COST CODE 00090			700	57,470	0	0	0	0	0	57,470
	WBS 111100										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 111100	DEFINITIVE DESIGN			700	57,470	0	0	0	0	0	57,470

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 2
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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
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	E & I DURING CONSTRUCTION 5% OF TOTAL CONSTRUCTION LABOR COSTS	000	350 MHR	350	28735	0	0	0	0	0	28735
SUBTOTAL HOME OFFICE LABOR				350	28,735	0	0	0	0	0	28,735
TOTAL COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)				350	28,735	0	0	0	0	0	28,735
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				350	28,735	0	0	0	0	0	28,735

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PRMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 3
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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	600	100	0	0	0	0	700
310011.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	0	504
310011.0701008	1 TEAMSTER- *****	460	1 LS	8	301	0	0	0	0	0	301
310011.0701102	2 OPERATORS, WELD TRUCK EXTEND CASING 1' AND INSTALL GROUT PAD HIGHER. ASSUME 3 HOURS/WELL	460	53 EA	318	11935	2014	7950	0	0	398	22297
310011.0701104	2 LABORERS	460	53 EA	318	10011	0	0	0	0	0	10011
310011.0701106	1 TEAMSTER	460	53 EA	159	5986	0	0	0	0	0	5986
SUBTOTAL SITE IMPROVEMENTS				835		2,114		0		398	
	CONSUMABLES 3.20 %				29,337		7,950		0		39,799
	GENERAL FOREMAN 7.00 %			58	2053		938				938
	GENERAL REQUIREMENTS 20.00 %			178	6278						2053
	SALES TAX 8.00 %						711		0		6278
	OH&P (ON MARKUPS ONLY)									82	711
											82
TOTAL COST CODE 46007				1,072		2,114		0		480	
WBS 310011					37,668		9,599		0		49,863
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310011 A-FARM EXTEND CASING AND GROUT PAD				1,072		2,114		0		480	
					37,668		9,599		0		49,863

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 4
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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
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	600	100	0	0	0	0	700
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	390	21875
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	7,800	0	0	390	43,228
	CONSUMABLES 3.20 %				32,962		1054				1054
	GENERAL FOREMAN 7.00 %			66	2307						2307
	GENERAL REQUIREMENTS 20.00 %			203	7053						7053
	SALES TAX 8.00 %						708		0		708
	OH&P (ON MARKUPS ONLY)									88	88

TOTAL	COST CODE 46007			1,219		2,076	9,563	0	0	478	54,440
	WBS 310021				42,323		9,563		0		54,440
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 310021	AX-FARM EXTEND CASING AND GROUT PAD			1,219		2,076	9,563	0	0	478	54,440

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ACCOUNT NUMBER	DESCRIPTION	COST	QUANTITY	MANHOURS	LABOR	EQUIP	SUB-	EQUIP-	CHAP	TOTAL
					USAGE	MATERIAL	CONTRACT	RENT	/ B & I	DOLLARS
310031.07	SITE IMPROVEMENTS	460	0	0	0	0	0	0	0	0
310031.0701002	241-B FARM- EXTEND CASING & GROUT PAD	460	48 EA	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	700
310031.0701006	2 LABORER	460	1 LS	16	504	0	0	0	0	504
310031.0701008	1 TEAMSTER	460	1 LS	8	301	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	20193
310031.0701104	2 LABORERS	460	48 EA	288	9066	0	0	0	0	9066
310031.0701106	1 TEAMSTER	460	48 EA	144	5422	0	0	0	0	5422
SUBTOTAL SITE IMPROVEMENTS										
		760			1,924					360
CONSUMABLES 3.20 & GENERAL FOREMAN 7.00 & GENERAL REQUIREMENTS 20.00 & SALES TAX 8.00 & OHP (ON MARKUPS ONLY)										
		53			1869			644		854
		162			5714					1869
										5714
										644
TOTAL COST CODE 46007 MBS 310031 RECALCULATION 0.004 - CONTINGENCY 30.00 %										
		975			1,924					434
										0
										0
										434
TOTAL MBS 310031 B-FARM EXTEND CASING AND GROUT PAD										
		975			1,924					434
										0
										0
										434
TOTAL 45,343										

FLUOR DANIEL NORTHWEST, INC. ** TEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PPHC008 - ESTIMATE DETAIL BY MBS / COST CODE
 FILE NO. Z696SALI
 JOB NO. Z696
 LOCHARD MARTIN
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 BY KLR/DLG

FLUOR DANIEL NORTHWEST, INC.
 LOCHBEE MARTIN
 JOB NO. Z696
 FILE NO. Z696SALI

** IRST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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 BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	HANROURS	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	615	34496
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		615	
					44,620		12,300		0		60,751
CONSUMABLES 3.20 %							1427				1427
GENERAL FOREMAN 7.00 %					88	3123					3123
GENERAL REQUIREMENTS 20.00 %					271	9548					9548
SALES TAX 8.00 %							1098		0		1098
OH&P (ON MARKUPS ONLY)										126	126
TOTAL COST CODE 46007				1,630		3,216		0		741	
WBS 310041						57,292	14,826		0		76,075
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310041 BX-FARM EXTEND CASING AND GROUT PAD				1,630		3,216		0		741	
						57,292	14,826		0		76,075

II-E-156

FLUOR DANIEL NORTHWEST, INC. ** EST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCROS - ESTIMATE DETAIL BY MBS / COST CODE
 FILE NO. Z696SAP1
 JOB NO. Z696
 LOCATED MARTIN
 PAGE 7
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 BY KLR/DLG

ACCOUNT NUMBER DESCRIPTION COST QUANTITY MANHOURS LABOR USAGE EQUIP SUB-EQUIP- OH&P TOTAL
 / B & I DOLLARS

ACCOUNT NUMBER	DESCRIPTION	COST	QUANTITY	MANHOURS	LABOR USAGE	EQUIP	SUB-EQUIP-	OH&P	TOTAL
310051.07	SITE IMPROVEMENTS								
310051.0701002	***** 241-BY FARM-EXTEND CASING & GROUT PAD	460	71 EA	0	0	0	0	0	0
310051.0701004	***** MOBILIZER INTO FARM-2 OPERATORS AND EQUIPMENT	460	1 LS	16	600	100	0	0	700
310051.0701006	***** 2 LABORER	460	1 LS	16	504	0	0	0	504
310051.0701008	***** 1 TRAMSTER	460	1 LS	8	301	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	29869
310051.0701104	***** 2 LABORERS	460	71 EA	426	13410	0	0	0	13410
310051.0701106	***** 1 TRAMSTER	460	71 EA	213	8019	0	0	0	8019

SUBTOTAL SITE IMPROVEMENTS		1,105		2,798	10,650	533			52,803
CONSUMABLES 1.20 %					1242				1242
GENERAL FOREMAN 7.00 %					77				2717
GENERAL REQUIREMENTS 20.00 %					236				8307
SALES TAX 8.00 %									951
OHP (ON MARKUPS ONLY)									109
TOTAL		1,418		2,798	12,843	642			66,131
COST CODE 46007									
MBS 310051									
RESCALATION 0.00% - CONTINGENCY 30.00 %									

TOTAL MBS 310051 BY-FARM EXTEND CASING AND GROUT PAD		1,418		2,798	12,843	642			66,131

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAU1

** IBST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 8
 DATE 08/09/99 15:35:57
 BY KLR/DLG

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 RIGHER. ASSUME 3 HOURS/WELL	460	70 EA	420	15763	2660	10500	0	0	525	29448
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	525	52,082
	CONSUMABLES 3.20 \$						1225				1225
	GENERAL FOREMAN 7.00 \$			76	2680						2680
	GENERAL REQUIREMENTS 20.00 \$			233	8195						8195
	SALES TAX 8.00 \$						938				938
	OH&P (ON MARKUPS ONLY)									108	108
	TOTAL			1,399	49,173	2,760	12,663	0	0	633	65,230
	WBS 310061 (ESCALATION 0.00% - CONTINGENCY 30.00 %)										
	TOTAL WBS 310061 C-FARM EXTEND CASING AND GROUT PAD			1,399	49,173	2,760	12,663	0	0	633	65,230

FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	548	30710
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		548	
	CONSUMABLES 3.20 %				40,292		10,950		0		54,664
	GENERAL FOREMAN 7.00 %			80	2820		1289				1289
	GENERAL REQUIREMENTS 20.00 %			245	8622						8622
	SALES TAX 8.00 %						979		0		979
	OH&P (ON MARKUPS ONLY)									113	113

TOTAL	COST CODE 46007			1,474		2,874		0		661	
	WBS 310071				51,734		13,218		0		68,488
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 310071	S-FARM EXTEND CASING AND GROUT PAD			1,474		2,874		0		661	
					51,734		13,218		0		68,488

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMC08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	***** 241-SX FARM- EXTEND CASING & GROUT PAD *****	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	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	788	44172
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	57,157	4,090	15,750	0	0	788	77,785
	CONSUMABLES 3.20 %						1829				1829
	GENERAL FOREMAN 7.00 %			113	4000						4000
	GENERAL REQUIREMENTS 20.00 %			348	12231						12231
	SALES TAX 8.00 %						1406		0		1406
	OH&P (ON MARKUPS ONLY)									161	161

TOTAL	COST CODE 46007			2,090	73,389	4,090	18,985	0	0	949	97,414
	WBS 310081										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 310081 SX-FARM EXTEND CASING AND GROUT PAD				2,090	73,389	4,090	18,985	0	0	949	97,414

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SALI

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	713	39965
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		713	
	CONSUMABLES 3.20 %				51,471		14,250		0		70,144
	GENERAL FOREMAN 7.00 %			102	3602		1647				1647
	GENERAL REQUIREMENTS 20.00 %			313	11014						3602
	SALES TAX 8.00 %						1271		0		11014
	OH&P (ON MARKUPS ONLY)									145	1271
TOTAL COST CODE 46007				1,881		3,710		0		858	
WBS 310091					66,088		17,168		0		87,826
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310091 T-FARM EXTEND CASING AND GROUT PAD				1,881		3,710		0		858	
					66,088		17,168		0		87,826

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SALL

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	241-TX FARM- EXTEND CASING & GROUT PAD	460	102 EA	0	0	0	0	0	0	0	0
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	765	42909
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		765	
CONSUMABLES 3.20 %					55,160		15,300		0		75,201
GENERAL FOREMAN 7.00 %				109	3861		1765				3861
GENERAL REQUIREMENTS 20.00 %				335	11804						11804
SALES TAX 8.00 %							1365		0		1365
OH&P (ON MARKUPS ONLY)										156	156
TOTAL COST CODE 46007				2,015		3,976		0		921	
WBS 310101					70,825		18,430		0		94,153
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310101 TX-FARM EXTEND CASING AND GROUT PAD				2,015		3,976		0		921	
					70,825		18,430		0		94,153

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FLUOR DANIEL NORTHWEST, INC.
 LOCHNEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	233	13042
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		233	
					17,742		4,650		0		23,903
CONSUMABLES 3.20 %							567				567
GENERAL FOREMAN 7.00 %					39	1241					1241
GENERAL REQUIREMENTS 20.00 %					108	3796					3796
SALES TAX 8.00 %							417		0		417
OH&P (ON MARKUPS ONLY)										49	49
TOTAL COST CODE 46007				648		1,278		0		282	
WBS 310111						22,780	5,635		0		29,976
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 310111 TY-FARM EXTEND CASING AND GROUT PAD				648		1,278		0		282	
					22,780		5,635		0		29,976

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FLUOR DANIEL NORTHWEST, INC.
 LOCHSIED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOOURS	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	450	25241
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		450	
	CONSUMABLES 3.20 %				33,026		9,000		0		44,856
	GENERAL FOREMAN 7.00 %			65	2311		1056				1056
	GENERAL REQUIREMENTS 20.00 %			201	7067						2311
	SALES TAX 8.00 %						804		0		7067
	OH&P (ON MARKUPS ONLY)									93	804
										93	93
TOTAL	COST CODE 46007			1,206		2,380		0		543	
	WBS 310121				42,405		10,861		0		56,189
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 310121 U-FARM EXTEND CASING AND GROUT PAD				1,206		2,380		0		543	
					42,405		10,861		0		56,189

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FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION LABOR COSTS	900	1 LS	0	0	0	0	172000	0	0	172000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	172,000	0	0	172,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	172,000	0	0	172,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	172,000	0	0	172,000

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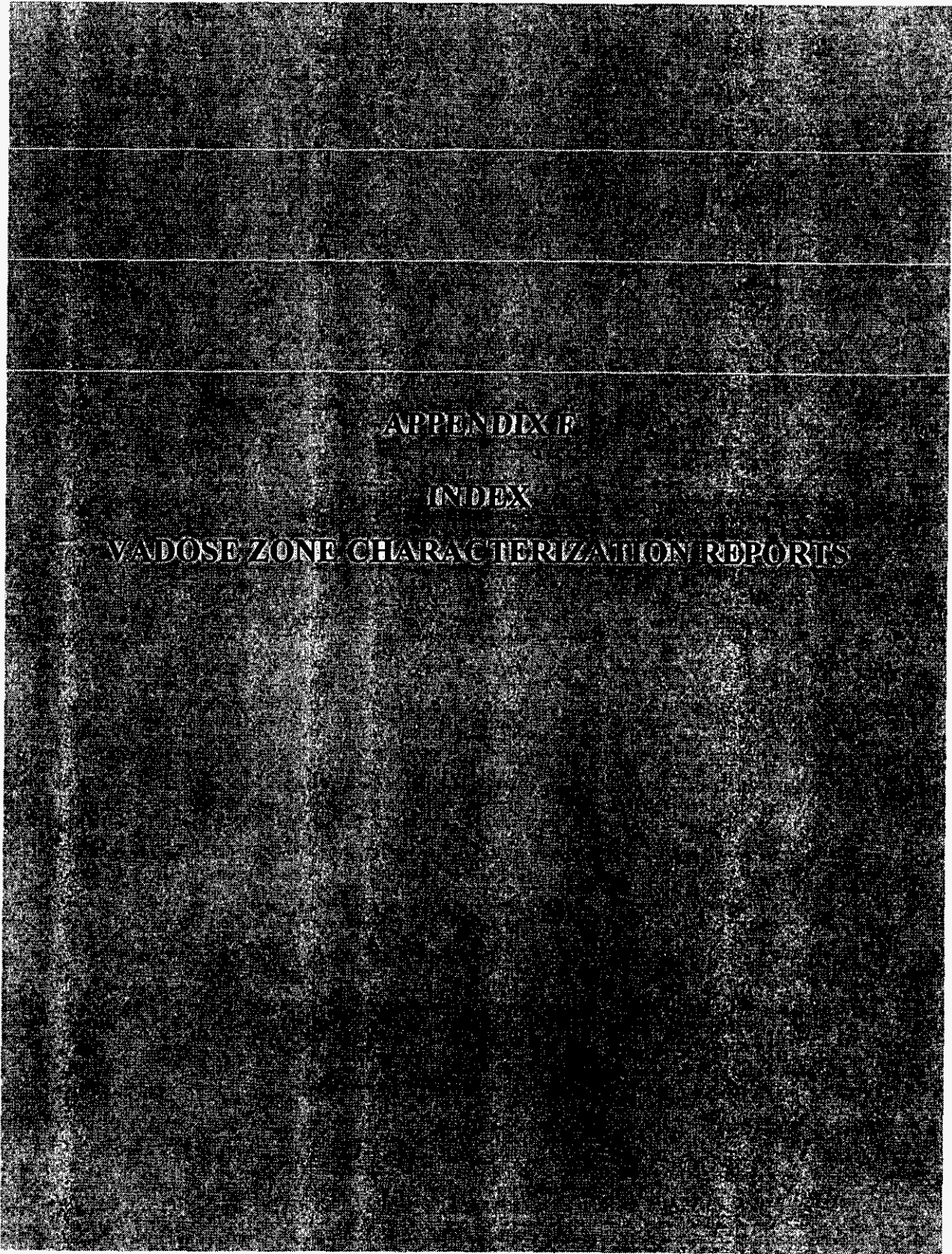
FLUOR DANIEL NORTHWEST, INC.
 LOCHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAL1

** IEST - INTERACTIVE ESTIMATING **
 INTER. REM. ACTIONS-EXTEND CASING AND GROUT PAD
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				18,083	684,019	33,196	152,494	172,000	0	7,627	1,049,338

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APPENDIX B

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-13	GJO-97-13-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			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			SX-107	GJ-HAN-009		
B-108			SX-108	GJ-HAN-010		
B-109	GJ-HAN-130		SX-109	GJ-HAN-011		
B-110			SX-110	GJ-HAN-012		
B-111	GJ-HAN-132		SX-111	GJ-HAN-013		
B-112			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			
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			
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 C
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 #	W. STATE #	HANFORD (R)		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	Casings	Cap	Recon- ced	Report	Drill	Casings	Recon- ced	m																		
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																	
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		JAI-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) / 4.86" Casing - Grouted Between							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	7/23/78																	
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 / 4.86" Casing			XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC			
10-05-02	299-E25-068		A6507											130	122	119.8	122	37.2	7/23/78																	
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	41263	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/ 6.88" 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	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	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 8" for 18", 6" for 130"					XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC
10-06-07	299-E25-077		A6516											130	130	124.0	130	39.6	7/18/78																	
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	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	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/ 4.86" Casing					XX	XX	XX	XX	XX	XXC	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	12/8/32	F1	Log on File, Casing Removed					XXC	XXC	XX	XX	XXC	****	****	****	XXC	XXC	XXC

241 - BX - FARM WELLS

Table with columns: FARM #, SITE #, PREVIOUS #, Wt. STATE #, COORDINATES (HNFORD (R) NORTH, WEST, LAMBERT (M) NORTH, EAST), WELLS/BOREHOLES (Report, Drill, Gamma, Cap, Recor-ded, in), DATE Installed, TYPE, COMMENTS, LOGS, and WELLS IDENTIFIED IN HANFORD WELLS REPORTS (1956-1993).

241 - BY - FARM WELLS

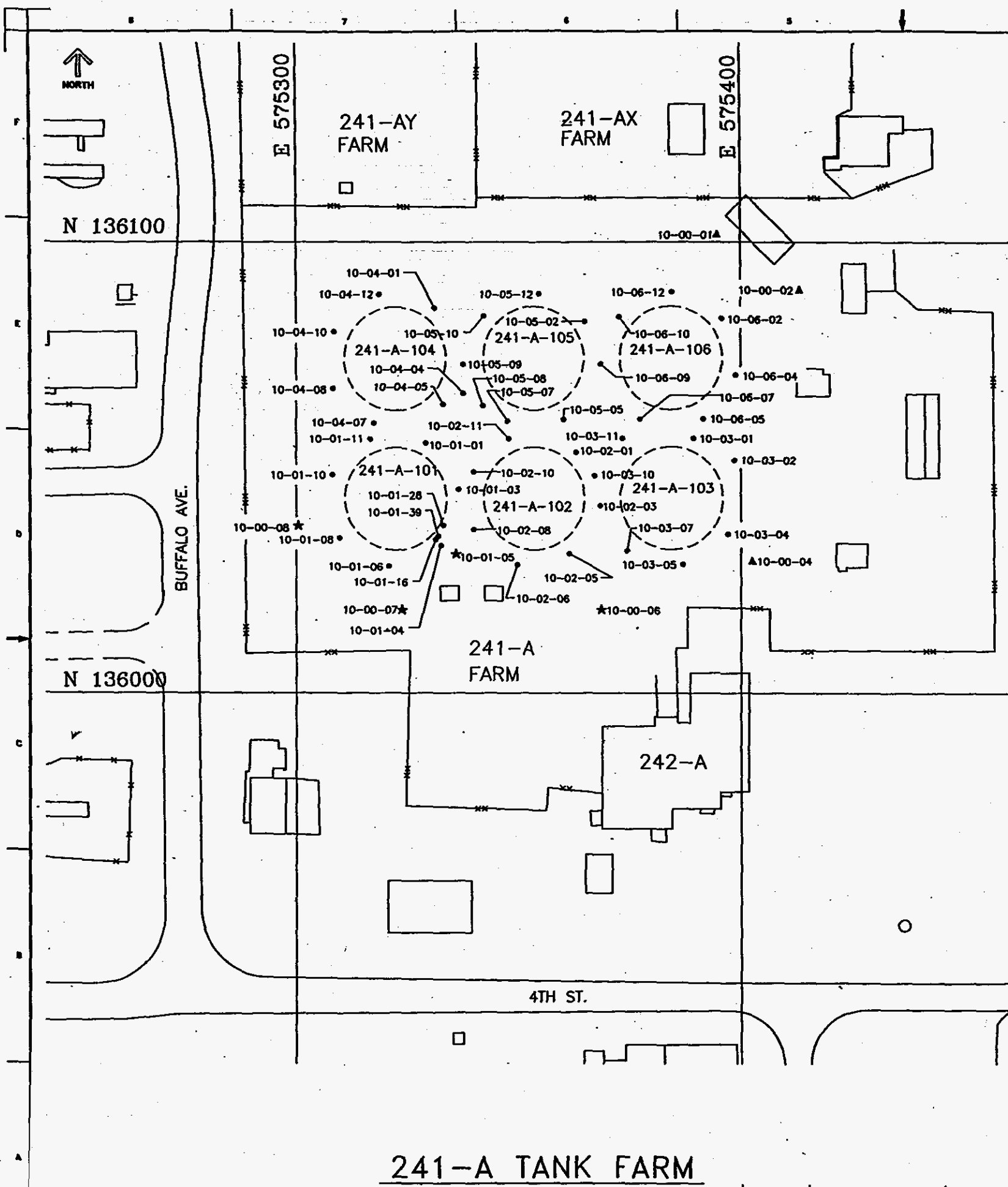
Table with columns: FARM #, WELL NUMBER, COORDINATES (HANFORD (ft), LAMBERT (m)), WELLS/BORHOLES (Dia. (in.), DEPTH (ft)), COMMENTS, LOGS, and WELLS IDENTIFIED IN HANFORD WELLS REPORTS (1956-1993). The table contains detailed data for various wells, including well numbers, coordinates, diameters, depths, and completion status.

241 - SX - FARM WELLS																																											
FARM #	WELL NUMBER			COORDINATES				WELLS/BOREHOLES										DATE INSTALLED	TYPE	COMMENTS	COMMENTS	WELLS IDENTIFIED IN HANFORD WELLS REPORTS																					
	SITE #	PREVIOUS	WL STATE #	HANFORD (ft)		LANBERT (m)		DIA. (in.)					DEPTH (ft)									1956	1958	1963	1968	1973	1976	1977	1979	1985	1989	1993											
				NORTH	WEST	NORTH	EAST	Report	Drill	Well Services	Casing	Cap	Reconn.	Report	Drill	Casing	Reconn.																m	HW-44235.0	HW-44235.1	HW-44235.2	BNWL-928	BNWL-1729	BNWL-1961	BNWL-2294	PWL-2994	PWL-3297	PWL-4897
41-00-02	299-W23-061	241-SX-4	A7897	35520	75600	134287.6	566855.2	6		6	6.125	8		102	102	97.2	102	31.1	09/23/54	E	MIN. & MAX. PERFORATED DEPTH, 10-99 R	E-TAPED, RESOURCE PROTECTION WELL REPORT (DEPTH-98.2 FT)	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC						
41-00-03	299-W23-002	241-SX-4, IBM-2910, EMA-2910	A4985	35425	75605	134258.7	566854.1	4	4"	4	8	4"	4"	236	236	223.1	236	71.9	09/09/54	B1	MIN. & MAX. PERFORATED DEPTH, 184-235 R 4 IN, 0-175 R, PERF 0-20 90-170, GROUTED (PERF 0-209, GROUTED 0-170)	E-TAPED, WL-190 (6/6/75), WELL CONSTR. DETAILS, 4 1/2" CASING (8" WELL), WELL COMPLETION ASBUILT, RESOURCE PROTECTION WELL	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC				
41-00-04	299-W23-005		A4988	35200	75550	134190.2	566870.7	4	4"	4	4/8	4"	4"	250	253	200.1	250	76.2	10/02/69	B1	MIN. & MAX. PERFORATED DEPTH, 170-245 R 4 IN 0-165 R PERF 0-20 90-160, GROUTED (PERF 0-209 GROUTED 0-160)	E-TAPED, WELL COMPLETION ASBUILT, 4 1/2" CASING (8" WELL), RESOURCE PROTECTION WELL				XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC			
41-00-05	299-W23-003	241-SX-12, IBM-2911 EMA-2911	A4986	35110	75615	134162.7	566851.2	4	4"	4	10	4"	4"	232	232	215.0	232	70.7	02/28/56	B1	MIN. & MAX. PERFORATED DEPTH, 176-228 R 4 IN 0-170 R PERF 0-20 90-165, GROUTED (PERF 0-209 GROUTED 0-165)	E-TAPED, WELL COMPLETION ASBUILT, 4 1/2" CASING (8" WELL), RESOURCE PROTECTION WELL	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC		
41-00-06	299-W23-232		NA	34983	75803	134123.8	566793.7				6"12		6"12	5	6"12		68	68	20.7	06/08/96	F		6 1/2" CASING (G) WELL LOCATED APPROX. 21 FT SOUTH OF 299-W23-15																				
41-00-08	299-W23-065	241-SX-8	A7901	35297	75923	134219.4	566756.9	8	8	8	8	8	8	125	125	124.4	125	38.1	03/14/56	F1		E-TAPED	XX	XX	XX	XX	XX	XX	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	F1	DEEPENED 5/73																						
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		(G) CHAIN DEPTH																					
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																					
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 R	E-TAPED, RESOURCE PROTECTION REPORT	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	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																					
41-01-10	299-W23-191		A8027	35567	75711	134301.9	566821.3	6	6"	6	6.125	6	6"	100	100	100.3	100	30.5	11/29/74	F		E-TAPED, 6 1/2" CASING																					
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																					
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																					
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 R, 0-18 R	E-TAPED, GROUTED, WELL COMPLETION REPORT, RESOURCE PROTECTION REPORT																					
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 R	RESOURCE PROTECTION REPORT, DEPTH MEASURED	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	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																					
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																					
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																					
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																					
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																					
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																					
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																					
41-03-12	299-W23-137		A7973	35596	75869	134310.6	566773.2	6	6	6	6	6	6	100	100		100	30.5	01/24/72	F	DEEPENED 5/73	RESOURCE PROTECTION REPORT																					
														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																					
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																					
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																					
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 R	E-TAPED, RESOURCE PROTECTION REPORT	XX	XX	XX	XX	XX	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	XXC	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																					
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																					
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 TAB, WELL COMPLETION REPORT																					
														130	130	130.0	130	39.6	09/20/78																								

241 - TX - FARM WELLS																																	
WELL NUMBER				COORDINATES				WELLS/BOREHOLES										COMMENTS		COMMENTS		WELLS IDENTIFIED IN HANFORD WELLS REPORTS											
FARM #	SITE #	PREVIOUS #	W. STATE #	HANFORD (ft)		LAMBERT (m)		Report	Drill	Well Services	Cannon	Cap	Recon- celled	Report	Drill	Cannon	Recon- celled	m	DATE Installed	TYPE	HANFORD WELL REPORT	LOGS	1956	1958	1963	1968	1972	1976	1977	1979	1985	1989	1993
				HW-44355.0	HW-44355.1	HW-44355.2	HW-44355.3																HW-44355.4	HW-44355.5	HW-44355.6	HW-44355.7	HW-44355.8	HW-44355.9	HW-44355.10	HW-44355.11	HW-44355.12	HW-44355.13	HW-44355.14
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	11/29/73	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	XX	X		
51-17-03	299-W15-068	241-TX-9	A7349	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	XXC	XX	
51-17-10	299-W15-122		A7421	42082	75894	136287.2	566760.6	6		6	6.125	6	6	100	100.0	100.0	100	30.5	10/07/70	F						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	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	XX	X		
51-18-09	299-W15-183		A7481	42054	76001	136278.6	566728.0	6		6	6	6	6	100	100.0	99.1	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	I		CLEANED HOLE, SAMPLED, PULLED CASING											X
NA	299-W15-194		A7492	41709	75958	136173.5	566741.4	6	6"		6	6	6"	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 - U - FARM WELLS																																
WELL NUMBER				COORDINATES				WELLS/BOREROLES										COMMENTS		COMMENTS		WELLS IDENTIFIED IN HANFORD WELLS REPORTS										
FARM #	SITE #	PREVIOUS #	W. 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	Comm.	Cap	Recon- ced	Report	Drill	Comm.	Recon- ced					m	HW-44355.0	HW-44355.1	HW-44255.2	BNWL-228	BNWL-1729	BNWL-1981	BNWL-2296	PNL-2894	PNL-4397	PNL-4897
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	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	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	XX	X	
NA	299-W18-111		A7594	NA	NA									NA				NA	NA	I	CASING REMOVED									XXC	XC	XXC

APPENDIX H
ENGINEERING SKETCHES



241-S FARM WELLS

FARM#	SITE#	STATE#	Dia	Depth	DATE Installed	TYPE
10-04-04	299-E25-056	A6045	6	131	06/02/55	F1
10-04-05	299-E25-063	A6502	6	75	04/18/62	F
	DEEPENED		6	130	11/02/76	F
10-04-07	299-E24-066	A5821	6	75	05/03/62	F
	DEEPENED		6	125	10/28/76	F
10-04-08	299-E24-067	A5822	8	75	06/28/56	F1
	DEEPENED		8	130	10/28/76	F1
10-04-10	299-E24-068	A5823	4*6	75	05/04/62	G
	DEEPENED		4*7	122	11/03/76	G
10-04-12	299-E24-069	A5824	6	75	05/31/62	F
	DEEPENED		6	123	07/25/76	F
10-05-02	299-E25-068	A6507	4*6	75	05/06/62	F
	DEEPENED		4*7	122	07/25/76	F
10-05-05	299-E24-070	A6509	6	75	04/03/62	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	A6503	6	75	04/26/62	F
	DEEPENED		6	130	05/22/76	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	06/02/76	F
10-06-04	299-E25-075	A6514	6	75	05/01/62	F
	DEEPENED		6	130	06/08/76	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	07/18/76	F
10-06-09	299-E25-069	A6508	6	75	04/08/64	F
	DEEPENED		6	130	07/12/76	F
10-06-10	299-E25-072	A6511	6	75	04/10/62	F
	DEEPENED		6	130	07/11/76	F
10-06-12	299-E25-073	A6512	4*6	75	05/06/62	G
	DEEPENED		4*7	110	07/25/76	G
NA	299-E25-051	A6040	6	80	12/08/52	F1

241-S FARM WELLS

FARM#	SITE#	STATE#	Dia	Depth	DATE Installed	TYPE
10-00-01	299-E25-057	A6046	6	150	06/08/55	D
10-00-02	NA	NA	NA	NA	NA	NA
10-00-04	299-E25-058	A6047	6	151	06/30/55	D
10-00-06	299-E25-015	A4783	4*6	343	08/14/60	B1
10-00-07	299-E25-016	A6030	4*6	343	06/30/60	B1
	A4750					
10-00-08	299-E25-013	A4748	4*6	343	08/11/60	B1
					06/19/75	
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	04/08/62	F
10-01-05	299-E25-001	A4756	4/6	322	02/25/55	B1
10-01-06	299-E24-070	A5825	6	125	04/01/62	F
10-01-08	299-E24-071	A5826	6	75	02/13/62	F
	DEEPENED		6	130	08/12/76	F
10-01-09	NA	B6052	6	73	NA	F
10-01-10	299-E24-072	A5827	6	75	05/03/62	F
10-01-11	299-E24-073	A5828	6	75	05/02/62	F
	DEEPENED		6	130	09/01/76	F
10-01-16	299-E25-170	A6585	4*6	50	01/01/66	G
10-01-28	299-E25-204	A6608	6	44	01/13/64	F
10-01-38	299-E25-192	A6596	6	45	03/01/62	F
10-02-01	299-E25-090	A6529	6	75	04/21/62	F
	DEEPENED		6	130	07/11/76	F
10-02-03	299-E25-083	A6522	6	75	04/20/62	F
	DEEPENED		6	130	06/30/76	F
10-02-05	299-E25-085	A6524	6	75	04/18/62	F
	DEEPENED		6	130	06/05/76	F
10-02-06	299-E25-086	A6525	6	75	04/17/62	F
	DEEPENED		6	90	08/01/76	F
10-02-08	299-E25-087	A6526	6	75	04/30/62	F
	DEEPENED		6	130	06/15/76	F
10-02-10	299-E25-088	A6527	6	75	02/09/62	F
	DEEPENED		6	130	06/20/76	F
10-02-11	299-E25-089	A6528	6	75	04/01/62	F
	DEEPENED		6	130	06/29/76	F
10-03-01	299-E25-078	A6517	6	75	05/01/62	F
	DEEPENED		6	130	09/22/76	F
10-03-02	299-E25-079	A6518	6	75	04/30/62	F
	DEEPENED		6	130	04/30/76	F
10-03-04	299-E25-080	A6519	6	75	04/27/62	F
	DEEPENED		6	130	05/05/76	F
10-03-05	299-E25-081	A6520	6	75	04/26/62	F
	DEEPENED		6	130	05/10/76	F
10-03-07	299-E25-082	A6521	6	75	04/24/62	F
	DEEPENED		6	130	05/26/76	F
10-03-10	299-E25-053	A6044	6	151	05/31/55	F
10-03-11	299-E25-064	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

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-A TANK FARM

DWG NO	TITLE	REF NUMBER	TITLE

U.S. DEPARTMENT OF ENERGY
 Civil / ENVIR
 WELLS
 241-A FARM

ES-050051-C3 0

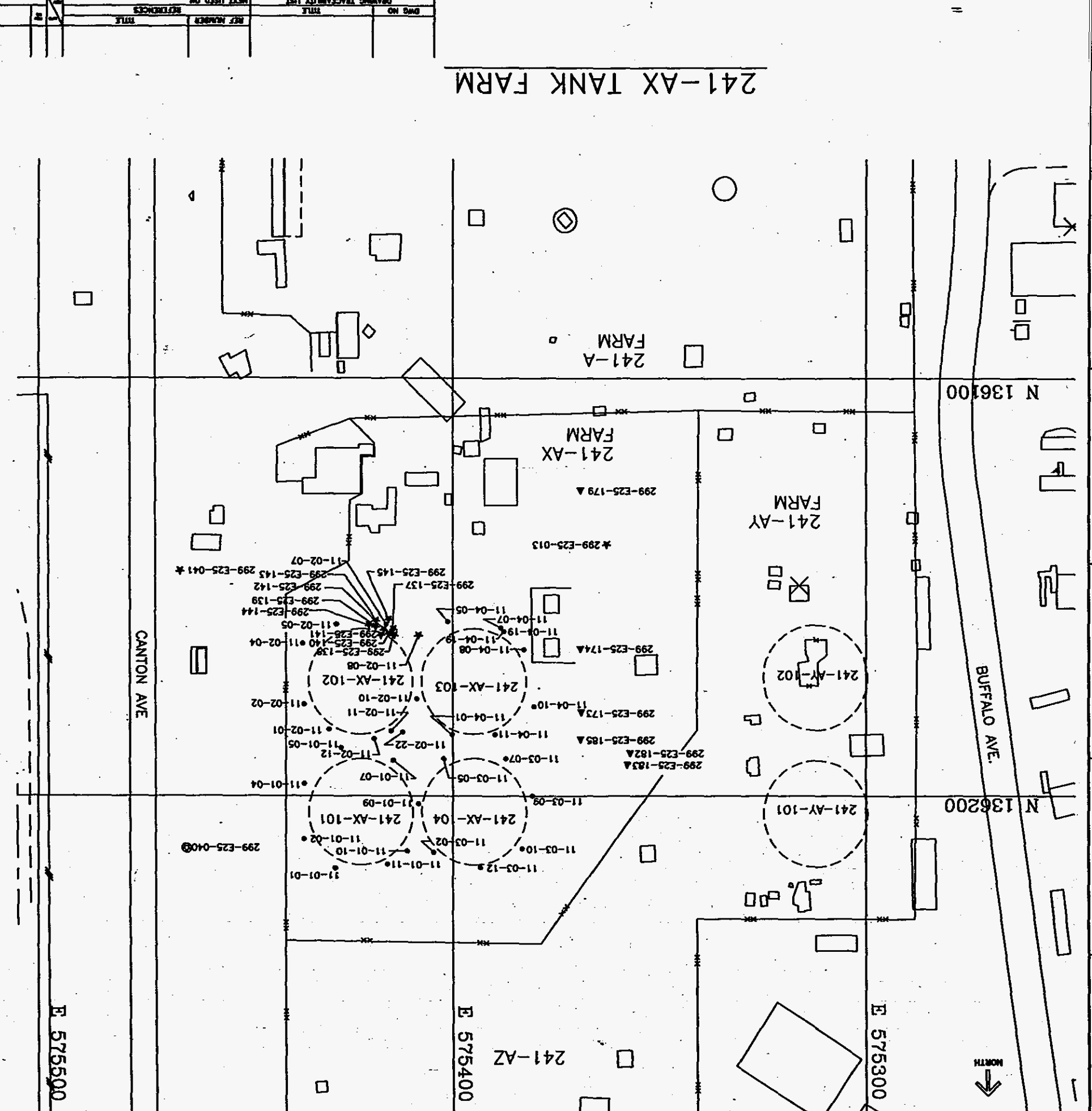
WELL NUMBER	DATE	TYPE
299-E25-098	11/26/74	F
299-E25-100	11-01-02	F
299-E25-101	11-01-04	F
299-E25-102	11-01-05	F
299-E25-103	11-01-07	F
299-E25-104	11-01-08	F
299-E25-105	11-01-11	F
299-E25-106	11-02-02	F
299-E25-107	11-02-04	F
299-E25-108	11-02-05	F
299-E25-109	11-02-07	F
299-E25-110	11-02-08	F
299-E25-111	11-02-10	F
299-E25-112	11-02-11	F
299-E25-113	11-03-02	F
299-E25-114	11-30-02	F
299-E25-115	11-03-07	F
299-E25-116	11-03-08	F
299-E25-117	11-05-10	F
299-E25-118	11-05-12	F
299-E25-119	11-04-01	F
299-E25-120	11-04-05	F
299-E25-121	11-04-07	F
299-E25-122	11-04-08	F
299-E25-123	11-04-10	F
299-E25-124	11-04-11	F
DEPDED	11-02-22	F
DEPDED	11-02-22	F
299-E25-128	11-02-12	F
NA	11-02-23	F
299-E25-131	11-01-10	F
299-E25-132	11-02-01	F
299-E25-133	11-02-03	F
299-E25-137	NA	F
299-E25-138	NA	F
299-E25-139	NA	F
299-E25-140	NA	F
299-E25-141	NA	F
299-E25-142	NA	F
299-E25-143	NA	F
299-E25-144	NA	F
299-E25-145	NA	F
299-E25-147	NA	F
299-E25-013	NA	F
299-E25-040	NA	F
299-E25-041	NA	F
299-E25-173	NA	F
299-E25-174	NA	F
299-E25-179	NA	F
299-E25-182	NA	F
299-E25-183	NA	F
299-E25-185	NA	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

U.S. DEPARTMENT OF ENERGY
 Civil / ENVIR
 WELLS
 241-AX FARM

WELL NUMBER	DATE	TYPE
299-E25-098	11/26/74	F
299-E25-100	11-01-02	F
299-E25-101	11-01-04	F
299-E25-102	11-01-05	F
299-E25-103	11-01-07	F
299-E25-104	11-01-08	F
299-E25-105	11-01-11	F
299-E25-106	11-02-02	F
299-E25-107	11-02-04	F
299-E25-108	11-02-05	F
299-E25-109	11-02-07	F
299-E25-110	11-02-08	F
299-E25-111	11-02-10	F
299-E25-112	11-02-11	F
299-E25-113	11-03-02	F
299-E25-114	11-30-02	F
299-E25-115	11-03-07	F
299-E25-116	11-03-08	F
299-E25-117	11-05-10	F
299-E25-118	11-05-12	F
299-E25-119	11-04-01	F
299-E25-120	11-04-05	F
299-E25-121	11-04-07	F
299-E25-122	11-04-08	F
299-E25-123	11-04-10	F
299-E25-124	11-04-11	F
DEPDED	11-02-22	F
DEPDED	11-02-22	F
299-E25-128	11-02-12	F
NA	11-02-23	F
299-E25-131	11-01-10	F
299-E25-132	11-02-01	F
299-E25-133	11-02-03	F
299-E25-137	NA	F
299-E25-138	NA	F
299-E25-139	NA	F
299-E25-140	NA	F
299-E25-141	NA	F
299-E25-142	NA	F
299-E25-143	NA	F
299-E25-144	NA	F
299-E25-145	NA	F
299-E25-147	NA	F
299-E25-013	NA	F
299-E25-040	NA	F
299-E25-041	NA	F
299-E25-173	NA	F
299-E25-174	NA	F
299-E25-179	NA	F
299-E25-182	NA	F
299-E25-183	NA	F
299-E25-185	NA	F



241-AX TANK FARM

BUFFALO AVE.

CANTON AVE

N 136100

N 136200

E 575400

E 575300



241-B FARM WELLS

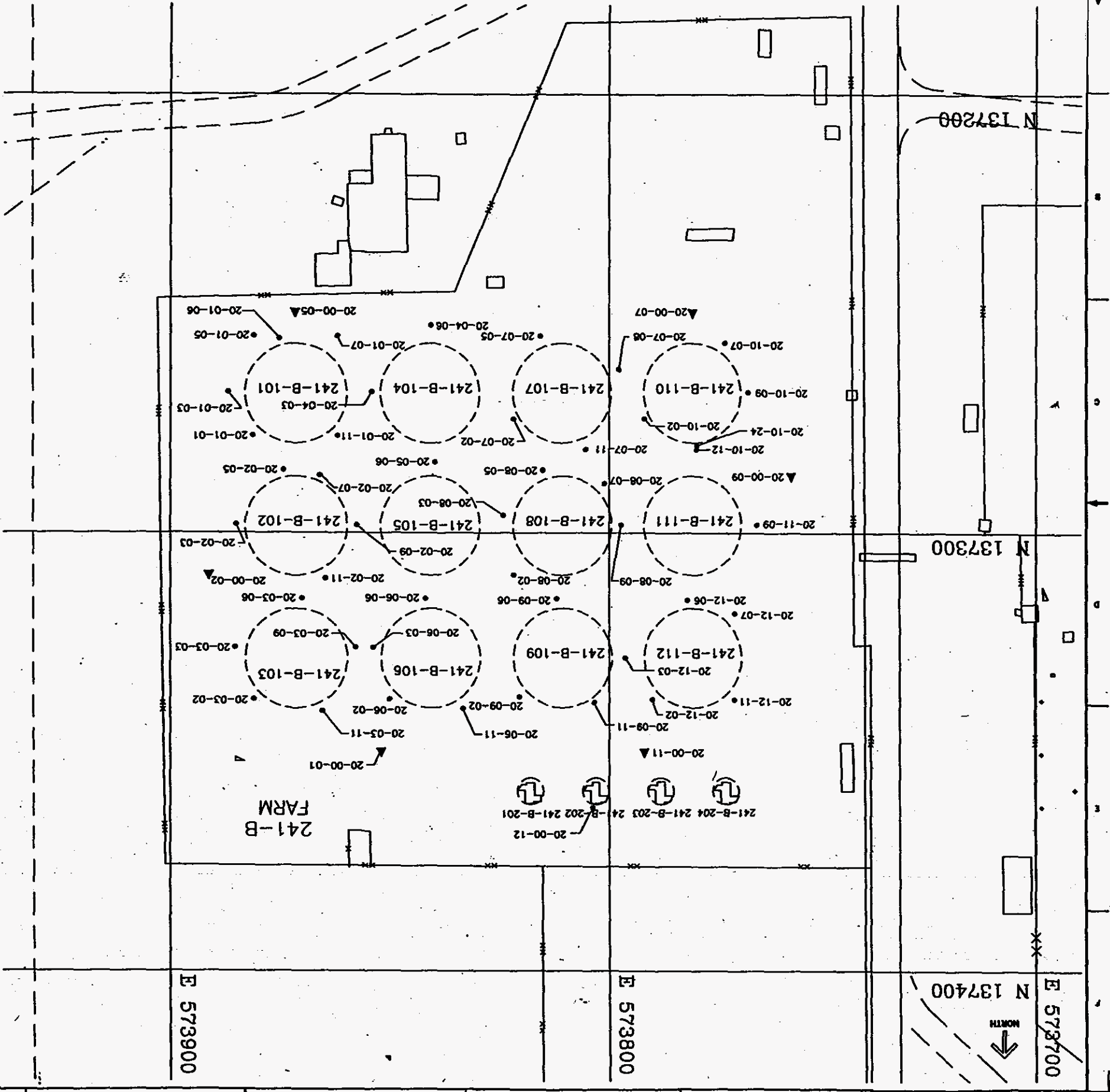
WELL NUMBER	Dkt	Depth	DATE	TYPE
FARM#	h	ft	Month/Day/Year	
SITE#	h	ft	Month/Day/Year	
STATE#	h	ft	Month/Day/Year	

20-00-01	299-E33-053	A8861	12/10	151	12/07/44	C
20-00-02	299-E33-051	A8859	12/10	151	11/30/44	C
20-00-03	299-E33-052	A8860	12/10	154	11/26/44	C
20-00-04	299-E33-056	A8862	12/10	150	12/06/44	C
20-00-05	299-E33-057	A8863	12/10	190	12/07/44	C
20-00-06	299-E33-055	A8863	12/10	159	12/15/44	C
20-00-07	299-E33-058	A8867	02/25/72	100	02/25/72	F
20-00-08	299-E33-179	A8867	02/25/72	100	02/25/72	F
20-00-09	299-E33-180	A8868	02/25/72	100	02/25/72	F
20-00-10	299-E33-181	A8869	02/25/72	100	02/25/72	F
20-00-11	299-E33-182	A8891	02/17/71	100	02/17/71	F
20-00-12	299-E33-183	A8891	02/17/71	100	02/17/71	F
20-00-13	299-E33-184	A8892	02/10/72	100	02/10/72	F
20-00-14	299-E33-185	A8893	02/20/73	100	02/20/73	F
20-00-15	299-E33-186	A8894	02/22/73	100	02/22/73	F
20-00-16	299-E33-187	A8895	01/18/72	100	01/18/72	F
20-00-17	299-E33-188	A8896	02/08/73	100	02/08/73	F
20-00-18	299-E33-219	A7028	06/07/73	100	06/07/73	F
20-00-19	299-E33-221	A7028	06/05/73	135	06/05/73	F
20-00-20	299-E33-218	A7025	05/22/73	120	05/22/73	F
20-00-21	299-E33-189	A8997	02/01/72	100	02/01/72	F
20-00-22	299-E33-191	A8998	03/01/72	100	03/01/72	F
20-00-23	299-E33-192	A8998	03/03/72	140	03/03/72	F
20-00-24	299-E33-193	A8999	03/01/72	100	03/01/72	F
20-00-25	299-E33-194	A7002	03/15/72	100	03/15/72	F
20-00-26	299-E33-195	A7003	03/17/72	100	03/17/72	F
20-00-27	299-E33-196	A7003	02/07/72	103	02/07/72	F
20-00-28	299-E33-197	A7005	01/18/72	100	01/18/72	F
20-00-29	299-E33-198	A7006	02/08/72	100	02/08/72	F
20-00-30	299-E33-201	A7008	01/07/73	100	01/07/73	F
20-00-31	299-E33-202	A7010	01/19/72	100	01/19/72	F
20-00-32	299-E33-203	A7011	01/12/72	100	01/12/72	F
20-00-33	299-E33-204	A7012	01/20/72	100	01/20/72	F

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

- SYMBOL LEGEND**
- ☒ DECOMMISSION WELLS - NO ACTION REQD
 - PRIORITY 3 WELLS
 - ▲ PRIORITY 2 WELLS
 - ★ PRIORITY 1 WELLS



U.S. DEPARTMENT OF ENERGY
 CIVIL / ENVIR WELLS
 241-B FARM

NAME: R. WILLIAMS
 TITLE: District Operations Office

WELL USED ON ES-051301-1

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		

REF NUMBER TITLE

DWG NO. TITLE

ES-050051-C3

241-B TANK FARM

N 137200

N 137300

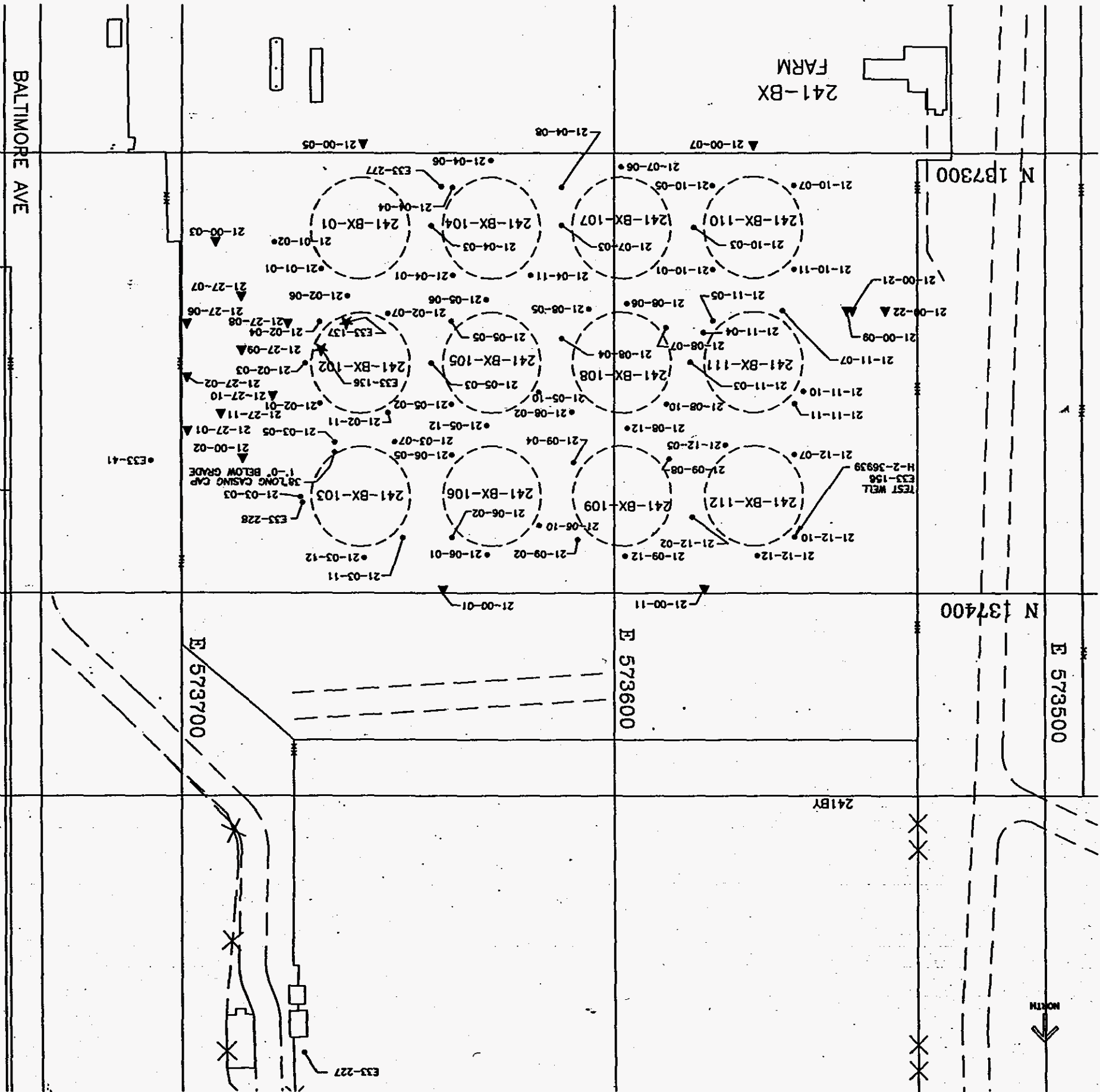
E 573700
 N 137400
 NORTH

E 573900

E 573800

U.S. DEPARTMENT OF ENERGY	U.S. DEPARTMENT OF ENERGY
CIVIL / ENVIR	WELLS
241-BX FARM	241-BX FARM
ES-050051-C3	ES-050051-C3

241-BX TANK FARM

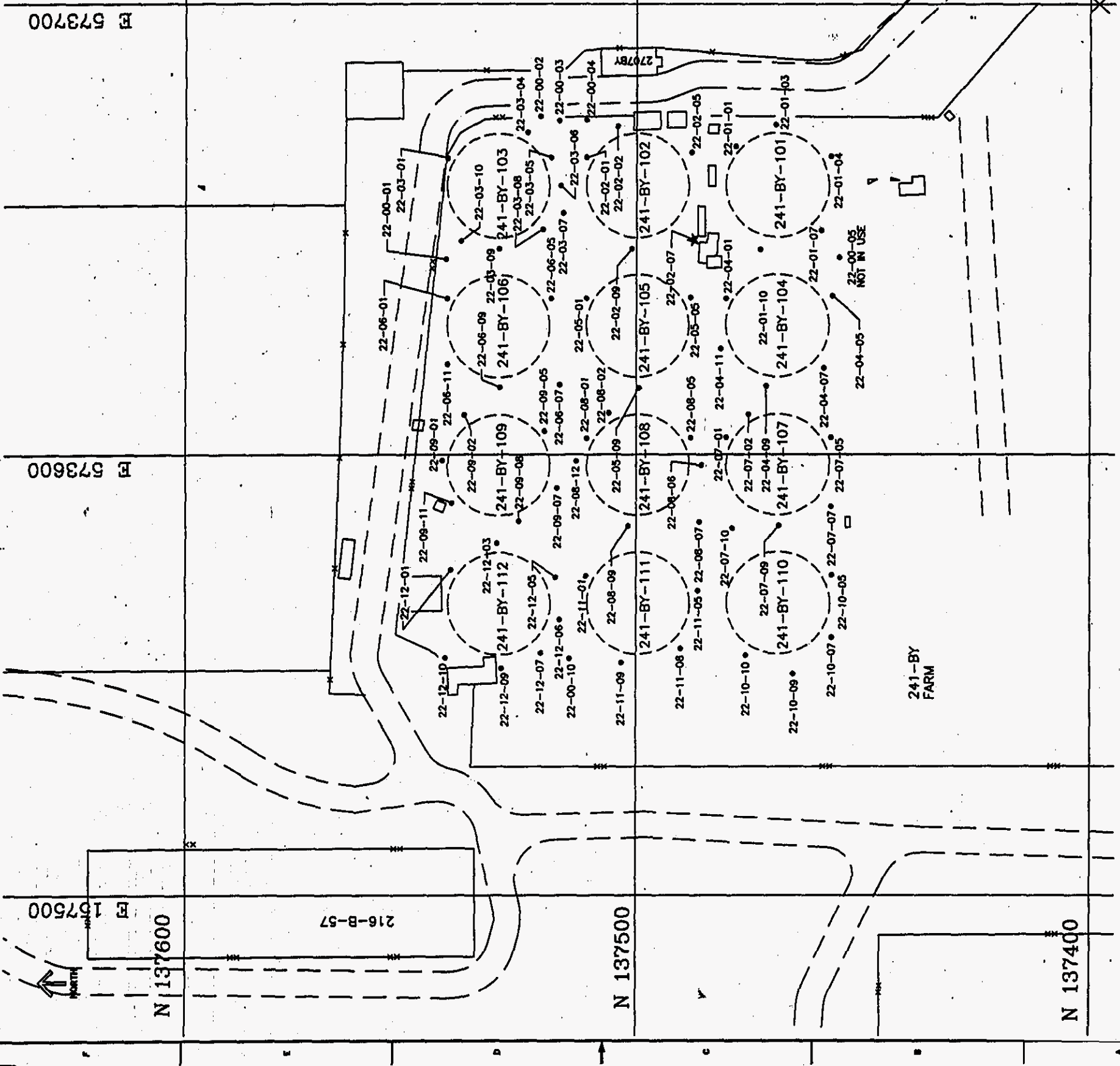


GENERAL NOTES:
 1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

FARM#	SITE#	STATE#	INSTR#	DATE	WELL NUMBER	DOE	DEPTH	TYPE
241-BX	01	WA	11	1/1/78	241-BX-091	150		F
241-BX	01	WA	11	1/1/78	241-BX-092	150		F
241-BX	01	WA	11	1/1/78	241-BX-093	150		F
241-BX	01	WA	11	1/1/78	241-BX-094	150		F
241-BX	01	WA	11	1/1/78	241-BX-095	150		F
241-BX	01	WA	11	1/1/78	241-BX-096	150		F
241-BX	01	WA	11	1/1/78	241-BX-097	150		F
241-BX	01	WA	11	1/1/78	241-BX-098	150		F
241-BX	01	WA	11	1/1/78	241-BX-099	150		F
241-BX	01	WA	11	1/1/78	241-BX-100	150		F
241-BX	01	WA	11	1/1/78	241-BX-101	150		F
241-BX	01	WA	11	1/1/78	241-BX-102	150		F
241-BX	01	WA	11	1/1/78	241-BX-103	150		F
241-BX	01	WA	11	1/1/78	241-BX-104	150		F
241-BX	01	WA	11	1/1/78	241-BX-105	150		F
241-BX	01	WA	11	1/1/78	241-BX-106	150		F
241-BX	01	WA	11	1/1/78	241-BX-107	150		F
241-BX	01	WA	11	1/1/78	241-BX-108	150		F
241-BX	01	WA	11	1/1/78	241-BX-109	150		F
241-BX	01	WA	11	1/1/78	241-BX-110	150		F
241-BX	01	WA	11	1/1/78	241-BX-111	150		F
241-BX	01	WA	11	1/1/78	241-BX-112	150		F
241-BX	01	WA	11	1/1/78	241-BX-113	150		F
241-BX	01	WA	11	1/1/78	241-BX-114	150		F
241-BX	01	WA	11	1/1/78	241-BX-115	150		F
241-BX	01	WA	11	1/1/78	241-BX-116	150		F
241-BX	01	WA	11	1/1/78	241-BX-117	150		F
241-BX	01	WA	11	1/1/78	241-BX-118	150		F
241-BX	01	WA	11	1/1/78	241-BX-119	150		F
241-BX	01	WA	11	1/1/78	241-BX-120	150		F
241-BX	01	WA	11	1/1/78	241-BX-121	150		F
241-BX	01	WA	11	1/1/78	241-BX-122	150		F
241-BX	01	WA	11	1/1/78	241-BX-123	150		F
241-BX	01	WA	11	1/1/78	241-BX-124	150		F
241-BX	01	WA	11	1/1/78	241-BX-125	150		F
241-BX	01	WA	11	1/1/78	241-BX-126	150		F
241-BX	01	WA	11	1/1/78	241-BX-127	150		F
241-BX	01	WA	11	1/1/78	241-BX-128	150		F
241-BX	01	WA	11	1/1/78	241-BX-129	150		F
241-BX	01	WA	11	1/1/78	241-BX-130	150		F
241-BX	01	WA	11	1/1/78	241-BX-131	150		F
241-BX	01	WA	11	1/1/78	241-BX-132	150		F
241-BX	01	WA	11	1/1/78	241-BX-133	150		F
241-BX	01	WA	11	1/1/78	241-BX-134	150		F
241-BX	01	WA	11	1/1/78	241-BX-135	150		F
241-BX	01	WA	11	1/1/78	241-BX-136	150		F
241-BX	01	WA	11	1/1/78	241-BX-137	150		F
241-BX	01	WA	11	1/1/78	241-BX-138	150		F
241-BX	01	WA	11	1/1/78	241-BX-139	150		F
241-BX	01	WA	11	1/1/78	241-BX-140	150		F
241-BX	01	WA	11	1/1/78	241-BX-141	150		F
241-BX	01	WA	11	1/1/78	241-BX-142	150		F
241-BX	01	WA	11	1/1/78	241-BX-143	150		F
241-BX	01	WA	11	1/1/78	241-BX-144	150		F
241-BX	01	WA	11	1/1/78	241-BX-145	150		F
241-BX	01	WA	11	1/1/78	241-BX-146	150		F
241-BX	01	WA	11	1/1/78	241-BX-147	150		F
241-BX	01	WA	11	1/1/78	241-BX-148	150		F
241-BX	01	WA	11	1/1/78	241-BX-149	150		F
241-BX	01	WA	11	1/1/78	241-BX-150	150		F

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- PRIORITY 3 WELLS
- ☒ DECOMMISSION WELLS - NO ACTION REQD.



241-BY FARM WELLS

FARM#	WELL NUMBER	SITE#	STATE#	Dia	Depth	DATE	TYPE
				In	ft	Installed	
22-08-05	299-E33-122	A6850	6	100	02/20/70	F	F
22-08-07	299-E33-260	A7067	6	100	06/06/74	F	F
22-08-08	299-E33-121	A6829	6	100	02/17/70	F	F
22-08-11	299-E33-253	A7060	6	100	05/02/74	F	F
22-10-05	299-E33-124	A6832	6	100	08/21/70	F	F
22-10-07	299-E33-254	A7061	6	100	05/07/74	F	F
22-10-09	299-E33-255	A7062	6	100	05/03/74	F	F
22-10-10	299-E33-125	A6833	6	100	06/19/70	F	F
22-11-01	299-E33-126	A6834	6	100	06/20/70	F	F
22-11-05	299-E33-127	A6835	6	100	06/17/70	F	F
22-11-08	299-E33-256	A6844	6	151	12/31/44	C	C
22-11-09	299-E33-128	A6836	6	100	06/13/70	F	F
22-12-01	299-E33-100	A6808	6	100	11/30/67	F	F
22-12-03	299-E33-094	A6802	6	100	11/15/67	F	F
22-12-05	299-E33-095	A6803	6	100	11/22/67	F	F
22-12-06	299-E33-096	A6804	6	100	12/01/67	F	F
22-12-07	299-E33-097	A6805	6	100	11/29/67	F	F
22-12-08	299-E33-098	A6806	6	100	12/06/67	F	F
22-12-09	299-E33-099	O6807	6	100	12/06/67	F	F

241-BY FARM WELLS

FARM#	WELL NUMBER	SITE#	STATE#	Dia	Depth	DATE	TYPE
				In	ft	Installed	
22-00-01	299-E33-085	A7047	6	150	08/02/68	D	D
22-00-02	299-E33-240	A7047	6	100	12/07/73	F	F
22-00-03	299-E33-084	A6862	6	150	07/21/68	D	D
22-00-04	299-E33-241	A7048	6	100	12/12/73	F	F
22-00-05	299-E33-083	A6861	6	150	07/11/68	D	D
22-01-01	299-E33-086	A6866	6	100	12/23/71	D	D
22-01-01	299-E33-176	A6864	6	100	08/17/68	D	D
22-01-03	299-E33-245	A7052	6	100	05/16/74	F	F
22-01-04	299-E33-177	A6865	6	100	12/24/71	F	F
22-01-07	299-E33-178	A6866	6	100	12/16/71	F	F
22-01-10	299-E33-246	A7053	6	100	05/07/74	F	F
22-02-01	299-E33-101	A6908	6	100	07/16/70	F	F
22-02-02	200-E33-227	A7034	6	100	07/21/73	F	F
22-02-05	299-E33-228	A7035	6	100	10/16/73	F	F
22-02-07	299-E33-099	A6873	6	275	07/21/68	D	D
22-02-09	299-E33-102	A6810	6	100	09/02/70	F	F
22-03-01	299-E33-104	A6812	6	100	06/07/70	F	F
22-03-04	299-E33-211	A7018	6	100	12/05/72	F	F
22-03-05	299-E33-103	A6811	6	100	08/12/70	F	F
22-03-06	299-E33-210	A7017	6	100	12/22/72	F	F
22-03-07	299-E33-242	A7049	6	100	12/14/73	F	F
22-03-08	299-E33-244	A7051	6	100	12/06/73	F	F
22-03-09	299-E33-105	A6813	6	100	08/06/70	F	F
22-03-10	299-E33-243	A7050	6	100	12/07/73	F	F
22-04-01	299-E33-106	A6814	6	100	09/02/70	F	F
22-04-05	299-E33-107	A6815	6	100	07/21/70	F	F
22-04-07	299-E33-248	A7055	6	100	05/13/74	F	F
22-04-08	299-E33-108	A6816	6	100	09/26/70	F	F
DELETED							
22-04-11	299-E33-249	A7056	6	125	07/12/83	F	F
22-05-01	299-E33-109	A6817	6	100	05/01/74	F	F
22-05-02	299-E33-110	A6818	6	100	07/08/70	F	F
22-05-06	299-E33-111	A6819	6	100	07/14/70	F	F
22-06-01	299-E33-112	A6820	6	100	07/23/70	F	F
22-06-05	299-E33-113	A6821	6	100	06/03/70	F	F
22-06-07	299-E33-086	A6844	6	150	08/04/68	D	D
22-06-08	299-E33-114	A6822	6	100	07/20/70	F	F
22-06-11	299-E33-250	A7057	6	100	05/03/74	F	F
22-07-01	299-E33-115	A6823	6	100	08/25/70	F	F
22-07-02	299-E33-206	A7013	6	100	01/04/73	F	F
22-07-05	299-E33-116	A6824	6	100	07/23/70	F	F
22-07-07	228-E33-251	A7058	6	100	05/08/74	F	F
22-07-09	299-E33-117	A6825	6	100	08/26/70	F	F
22-07-10	299-E33-252	A7059	6	100	05/09/74	F	F
22-08-01	299-E33-118	A6826	6	100	07/22/70	F	F
22-08-02	299-E33-206	A7015	6	100	01/18/73	F	F
22-08-05	299-E33-119	A6827	6	100	07/26/70	F	F
22-08-06	299-E33-207	A7014	6	100	01/02/73	F	F
22-08-07	299-E33-087	A6865	6	150	08/15/68	D	D
22-08-09	299-E33-120	A6828	6	100	08/04/70	F	F
22-08-12	299-E33-208	A7016	6	100	01/26/73	F	F
22-09-01	299-E33-123	A6831	6	100	02/24/70	F	F
22-09-02	299-E33-258	A7068	6	100	08/10/74	F	F

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- PRIORITY 3 WELLS
- ☒ DECOMMISSION WELLS- NO ACTION RECORD

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

241-BY TANK FARM

U.S. DEPARTMENT OF ENERGY			
CIVIL / ENVIR			
WELLS			
241-BY FARM			
NAME	ES-050051-C3	DATE	0
BY		SCALE	
DATE		PROJECT	ES-050051-C3
NO.		ISSUE	0

E 573700

E 573600

E 137500

N 137600

216-B-97

N 137500

N 137400

OVER NO		TITLE	
DRAWING TRACKABILITY LIST		REFERENCES	
REV NUMBER		BY	
DATE		REVISIONS	
REV		DATE	

241-C FARM WELLS						
WELL NUMBER			Di	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	08/20/74	F
30-08-03	299-E27-051	A6676	12/8	150	12/28/44	C1
30-08-12	299-E27-085	A6720	6	100	09/13/74	F
30-09-01	299-E27-096	A6721	6	100	07/28/74	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	08/30/74	F
30-10-11	299-E27-104	A6729	6	100	04/24/75	F
30-11-01	299-E27-063	A6688	6	100	02/09/74	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			Di	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	135	01/04/45	C1
30-00-06	299-E27-055	A6680	12/10	154	12/30/44	C
30-00-08	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	80	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	58	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
30-01-08	299-E27-058	A6683	6	100	01/08/70	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
	DEEPEMED			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
30-03-08	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-E27-068	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	08/18/74	F
30-05-10	299-E27-066	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	06/05/74	F
30-07-01	299-E27-067	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

N 136700

E 575000



E 575100

E 575200

N 136600

N 136500

241-C FARM

241-C FM

DWG NO	TITLE	REF NUMBER	TITLE

SYMBOL LEGEND

- ★] PRIORITY 1 WELLS
- ▲] PRIORITY 2 WELLS
-] PRIORITY 3 WELLS
- ☒] DECOMMISSION WELLS- NO ACTION REQ

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

NAME EJ WILLIAMS	U.S. DEPARTMENT OF ENERGY National Operations Office
CAD	CIVIL / ENVIR WELLS 241-C FARM
ES-050051-C3	0

241-S FARM WELLS

FARM/	WELL NUMBER	DEPTH	DATE	TYPE
	SITE#	ft	Installed	
40-10-01	299-W23-012	4+8	10/01/70	B2
40-10-03	299-W23-168	6	11/16/71	F
40-10-05	299-W23-204	6	03/18/78	F
40-10-06	299-W23-189	6	11/10/71	F
40-10-08	299-W23-205	140	05/22/73	F
40-10-09	299-W23-170	6	03/23/78	F
40-10-13	299-W23-218	6	11/11/71	F
40-11-01	299-W23-171	6	07/01/78	F
40-11-05	299-W23-208	6	11/09/71	F
40-11-07	299-W23-172	6	06/19/73	F
40-11-08	299-W23-207	6	02/21/74	F
40-11-09	299-W23-173	6	03/18/78	F
40-12-02	299-W23-174	6	10/29/71	F
40-12-04	299-W23-220	6	06/29/78	F
40-12-06	299-W23-175	6	11/03/71	F
40-12-07	299-W23-206	145	06/19/73	F
40-12-09	299-W23-176	6	03/06/76	F
40-12-09	299-W23-176	6	11/29/71	F

241-S FARM WELLS

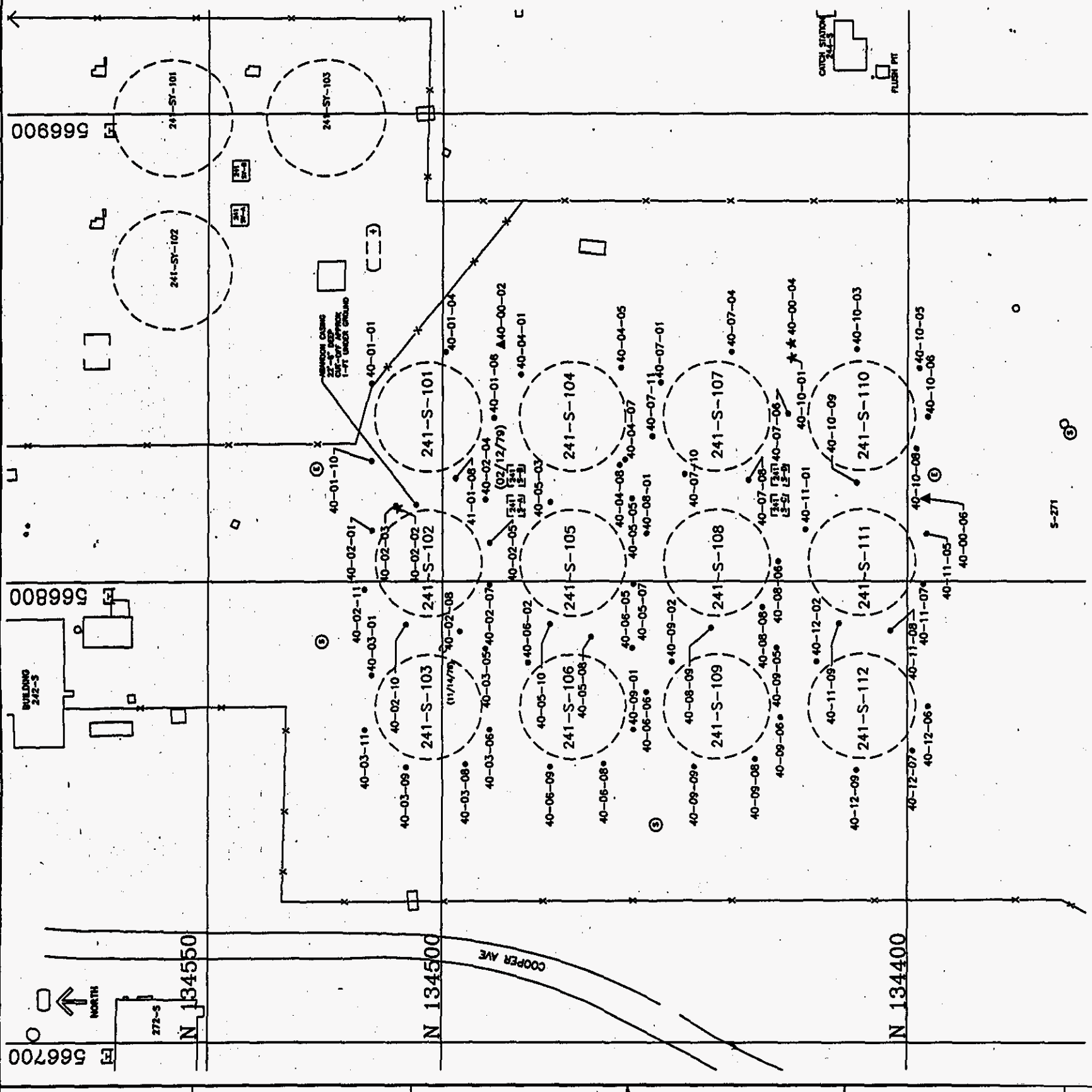
FARM/	WELL NUMBER	DEPTH	DATE	TYPE
	SITE#	ft	Installed	
40-10-02	299-W23-051	150	03/07/52	D
40-10-04	299-W23-001	4+8	06/04/52	B2
40-10-06	299-W23-056	150	04/23/52	D
40-01-01	299-W23-145	6	09/29/71	F
40-01-04	299-W23-179	6	05/28/73	F
40-01-06	299-W23-146	6	03/05/76	F
40-01-08	299-W23-147	6	09/28/71	F
40-01-10	299-W23-180	6	10/01/71	F
40-02-01	299-W23-148	6	03/21/74	F
40-02-01	299-W23-148	6	09/01/71	F
40-02-02	NA	130	05/28/73	F
40-02-03	299-W23-188	6	10/02/74	H
40-02-04	299-W23-052	144	03/01/52	D
40-02-05	299-W23-181	6	03/21/74	F
40-02-07	299-W23-149	6	09/28/71	F
40-02-08	299-W23-189	6	02/18/74	F
40-02-10	299-W23-150	6	10/04/71	F
40-02-11	299-W23-182	6	03/21/74	F
40-03-01	299-W23-212	6	10/06/71	F
40-03-03	299-W23-053	6	06/06/78	F
40-03-05	299-W23-152	6	03/01/52	D
40-03-08	299-W23-183	6	10/04/71	F
40-03-09	299-W23-153	6	03/18/78	F
40-03-09	DEPENDED	135	05/24/73	F
40-03-11	299-W23-184	6	05/18/73	F
40-04-01	299-W23-123	6	03/25/74	F
40-04-05	299-W23-124	6	06/05/70	F
40-04-07	DEPENDED	135	05/24/73	F
40-04-08	299-W23-122	6	06/10/70	F
40-04-08	299-W23-171	6	NA	
40-05-03	299-W23-154	6	10/14/71	F
40-05-05	299-W23-064	6	04/17/52	D
40-05-07	299-W23-155	6	10/22/71	F
40-05-08	299-W23-189	6	03/11/76	F
40-05-10	299-W23-156	6	04/13/71	F
40-06-02	299-W23-157	6	10/22/71	F
40-06-04	299-W23-213	6	06/01/78	F
40-06-05	299-W23-055	6	04/01/52	D
40-06-06	299-W23-201	6	11/25/71	F
40-06-08	299-W23-159	6	05/01/76	F
40-06-09	299-W23-160	6	10/25/71	F
40-07-01	299-W23-185	6	10/14/71	F
40-07-04	299-W23-185	6	03/25/74	F
40-07-06	299-W23-181	6	10/08/71	F
40-07-08	299-W23-186	6	03/27/74	F
40-07-10	299-W23-182	6	10/08/71	F
40-07-11	299-W23-187	6	04/03/74	F
40-08-01	299-W23-178	6	03/06/78	F
40-08-06	299-W23-163	6	11/04/71	F
40-08-08	299-W23-202	6	02/28/78	F
40-08-09	299-W23-164	6	10/18/71	F
40-09-01	299-W23-216	6	04/28/71	F
40-09-02	299-W23-185	6	03/15/76	F
40-09-05	299-W23-057	6	10/20/71	F
40-09-06	299-W23-166	6	04/09/52	D
40-09-08	299-W23-203	6	10/26/71	F
40-09-08	299-W23-203	6	03/11/78	F
40-09-09	299-W23-187	6	10/27/71	F
40-09-09	DEPENDED	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.

NAME	U.S. DEPARTMENT OF ENERGY
BY	CIVIL/ENVIOR
DATE	241-S FARM
	WELLS
	ES-050051-C3

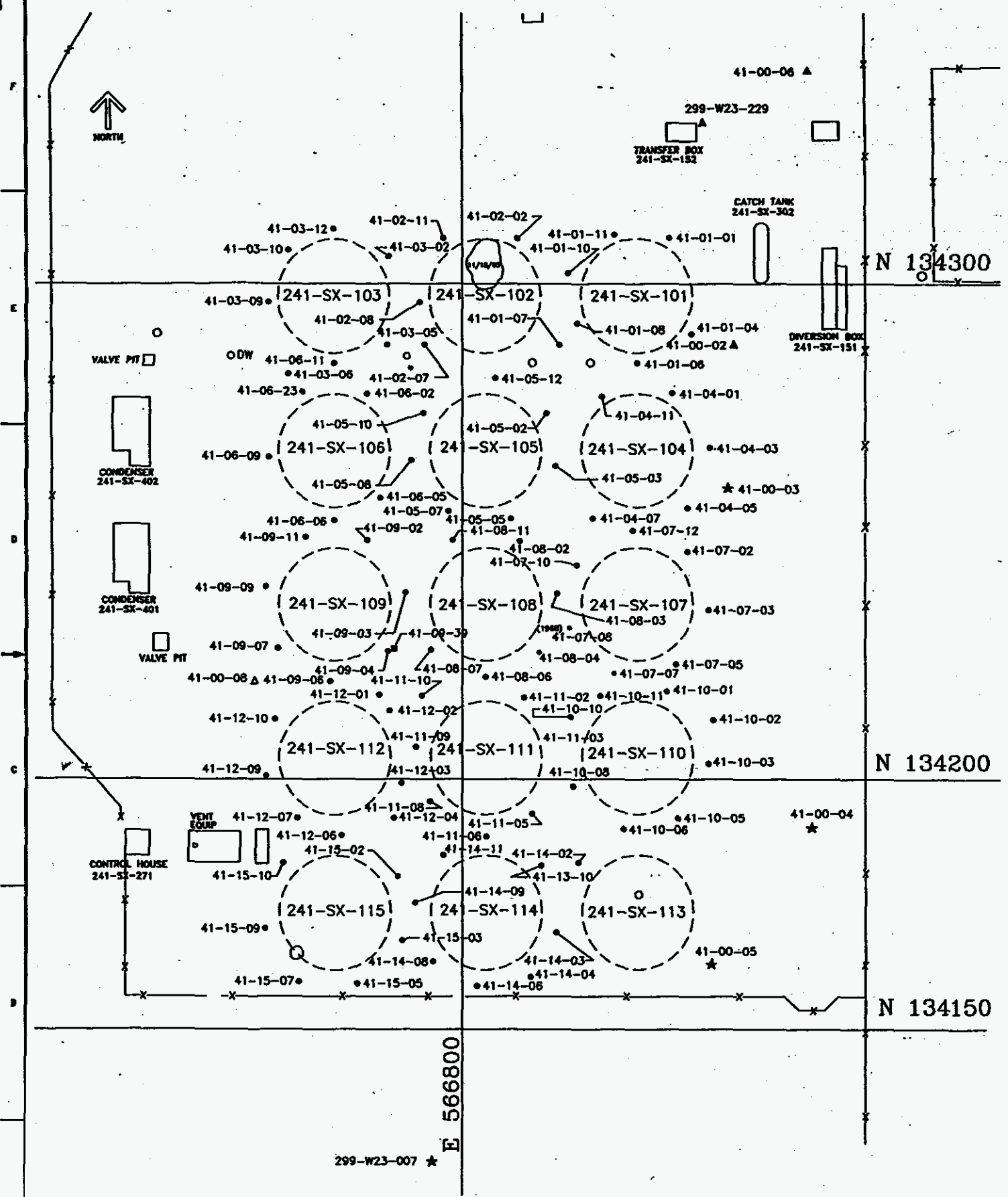


241-S TANK FARM

NO.	DATE	TITLE	BY	CHKD	REV
1	FEBRUARY 1985	WELLS			
2	MAY 1979	WELLS			
3	JUNE 1977	WELLS			
4	MARCH 1978	WELLS			
5	JUNE 1973	WELLS			
6	OCTOBER 1988	WELLS			
7	JANUARY 1985	WELLS			

241-SX FARM WELLS						
FARM#	WELL NUMBER	STATE#	Di	Depth	DATE	TYPE
41-00-04	299-W23-098	A7834	7	75	03/14/82	F
41-00-06	299-W23-099	A7835	6	75	03/12/82	F
	DEEPEMED			135	04/01/73	F
41-00-07	299-W23-100		6	75	03/18/82	F
41-00-11	299-W23-101	A7837	6	75	03/15/82	F
41-00-02	299-W23-110	A7946	6	75	03/23/82	F
41-00-03	299-W23-104	A7940	6	75	03/19/82	F
41-00-04	299-W23-105	A7941	6	75	03/21/82	F
	DEEPEMED			105	02/01/73	F
41-00-06	299-W23-106	A7942	6	75	03/20/82	F
41-00-07	299-W23-107	A7943	6	75	03/22/82	F
41-00-09	299-W23-108	A7944	6	75	03/22/82	F
	DEEPEMED			130	03/27/73	F
41-00-11	299-W23-109	A7945	6	75	03/23/82	F
41-00-30	299-W23-234	B2828	12	225	02/01/82	I
41-10-01	299-W23-080	A7916	6	75	02/23/82	F
	DEEPEMED			135	04/25/73	F
41-10-02	299-W23-086	A7902	8	128	03/01/82	F1
41-10-03	299-W23-081	A7917	6	75	02/22/82	F
41-10-05	299-W23-082	A7918	6	75	02/22/82	F
41-10-08	299-W23-083	A7919	6	75	02/27/82	F
41-10-08	299-W23-084	A7920	6	75	02/27/82	F
41-10-10	299-W23-067	A7903	8	128	03/18/82	F1
41-10-11	299-W23-085	A7921	6	75	03/01/82	F
41-11-02	299-W23-096	A7932	6	75	03/14/82	F
41-11-03	299-W23-097	A7933	6	75	03/15/82	F
41-11-05	299-W23-092	A7928	6	75	03/08/82	F
	DEEPEMED			135	04/19/73	F
41-11-06	299-W23-093	A7929	6	75	03/08/82	F
41-11-08	299-W23-094	A7930	8	75	03/08/82	F1
	DEEPEMED			135	04/11/73	F1
41-11-09	299-W23-095	A7931	6	75	03/12/82	F
41-11-10	299-W23-084	A7900	8	125	03/07/82	F1
41-12-01	299-W23-233	B2827	7*12	128	08/12/86	F
41-12-02	299-W23-111	A7947	6	75	03/28/72	F
	DEEPEMED			125	01/25/72	F
41-12-03	299-W23-112	A7948	6	75	03/28/82	F
41-12-04	299-W23-068	A7904	8	125	03/10/82	F1
41-12-06	299-W23-113	A7949	6	75	03/27/82	F
41-12-07	299-W23-114	A7950	6	75	04/04/82	F
41-12-09	299-W23-115	A7951	6	75	03/27/82	F
41-12-10	299-W23-116	A7952	6	75	03/29/82	F
41-12-1A	NA	NA	6	20.3	NA	H
41-13-10	299-W23-072	A7908	6	100	10/06/82	F
41-14-02	299-W23-091	A7927	6	75	03/09/82	F
41-14-03	299-W23-086	A7922	6	75	03/01/82	F
41-14-04	299-W23-089	A7905	8	125	03/20/82	F1
41-14-06	299-W23-087	A7923	6	75	03/02/82	F
41-14-08	299-W23-088	A7924	6	80	03/02/82	F
41-14-09	299-W23-089	A7925	6	75	03/06/82	F
41-14-11	299-W23-090	A7926	6	75	03/06/82	F
41-15-02	299-W23-117	A7953	6	75	03/29/82	F
41-15-03	299-W23-118	A7954	6	75	04/02/82	F
41-15-05	299-W23-119	A7955	6	75	03/30/82	F
41-15-07	299-W23-070	A7906	8	125	03/27/82	F1
41-15-09	299-W23-120	A7956	6	75	04/03/82	F
41-15-10	299-W23-121	A7957	6	75	04/03/82	F
	DEEPEMED			125	04/30/73	F
W23-7	299-W23-007	A4990	4*6	250	11/01/89	B
	NA	B8809	NA	225	NA	B

241-SX FARM WELLS						
FARM#	WELL NUMBER	STATE#	Di	Depth	DATE	TYPE
41-00-02	299-W23-061	A7897	8	102	08/23/84	E
41-00-03	299-W23-002	A7885	4*8	236	09/09/84	B2
41-00-04	299-W23-005	A7888	4*8	250	10/02/86	B2
41-00-05	299-W23-003	A7886	4*8	232	02/28/86	B2
41-00-06	299-W23-232	NA	5*12	88	08/08/86	F
41-00-08	299-W23-045	A7901	8	125	03/14/86	F1
41-01-01	299-W23-132	A7968	6	100	03/21/72	F1
	DEEPEMED			140	05/03/73	F1
41-01-04	299-W23-190	A8028	6	100	11/01/74	F
41-01-06	299-W23-133	A7988	6	100	12/27/71	F
41-01-07	299-W23-080	Q7896	8	101	09/21/84	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
	DEEPEMED			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	09/16/84	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
	DEEPEMED			140	05/07/73	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	08/28/84	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	02/01/82	F
	DEEPEMED			130	09/20/78	F
41-05-03	299-W23-131	A7967	6	75	02/01/82	F
	DEEPEMED			130	09/18/78	F
41-05-05	299-W23-125	A7961	6	75	03/30/70	F
	DEEPEMED			135	04/03/73	F
41-05-07	299-W23-126	A7962	6	75	02/01/82	F
	DEEPEMED			130	08/03/78	F
41-05-08	299-W23-127	A7963	6	75	02/01/82	F
	DEEPEMED			130	09/30/78	F
41-05-10	299-W23-128	A7964	6	75	02/01/82	F
	DEEPEMED			130	09/01/78	F
41-05-12	299-W23-129	A7965	6	75	02/01/82	F
	DEEPEMED			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
	DEEPEMED			140	03/25/73	F
41-06-08	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	09/13/84	E
41-06-23	299-W23-227	A8054	6	130	05/02/78	F
41-07-02	299-W23-074	A7910	6	75	02/19/82	F
41-07-03	299-W23-075	A7911	6	75	02/20/82	F
41-07-05	299-W23-076	A7912	6	83	02/19/82	F
41-07-07	299-W23-077	A7913	6	75	02/20/82	F
41-07-08	299-W23-078	A7914	6	75	02/22/82	F
41-07-10	299-W23-079	A7915	6	75	02/23/82	F
41-07-12	299-W23-073	A7909	4*6	75	02/15/82	B2
	DEEPEMED			80	09/23/78	B2
41-08-02	299-W23-102	A7938	8	75	03/16/82	F1
41-08-03	299-W23-103	A7939	6	75	03/16/82	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.

DATE	BY	TITLE
APR 63	W	WELLS FARM
MAY 64	W	WELLS FARM
JUNE 67	W	WELLS FARM
MARCH 69	W	WELLS FARM
JUNE 73	W	WELLS FARM
OCTOBER 1988	W	WELLS FARM
JANUARY 1993	W	WELLS FARM

U.S. DEPARTMENT OF ENERGY
 CIVIL / ENVIR
 WELLS
 241-SX FARM
 ES-050051-C3

241-T-FARM WELLS

FARM #	WELL NUMBER	STATE #	DATE Installed	DEPTH	TYPE
241-01	241-T-101	01	01/01/01	100	F
241-02	241-T-102	02	02/02/02	100	F
241-03	241-T-103	03	03/03/03	100	F
241-04	241-T-104	04	04/04/04	100	F
241-05	241-T-105	05	05/05/05	100	F
241-06	241-T-106	06	06/06/06	100	F
241-07	241-T-107	07	07/07/07	100	F
241-08	241-T-108	08	08/08/08	100	F
241-09	241-T-109	09	09/09/09	100	F
241-10	241-T-110	10	10/10/10	100	F
241-11	241-T-111	11	11/11/11	100	F
241-12	241-T-112	12	12/12/12	100	F
241-13	241-T-113	13	13/13/13	100	F
241-14	241-T-114	14	14/14/14	100	F
241-15	241-T-115	15	15/15/15	100	F
241-16	241-T-116	16	16/16/16	100	F
241-17	241-T-117	17	17/17/17	100	F
241-18	241-T-118	18	18/18/18	100	F
241-19	241-T-119	19	19/19/19	100	F
241-20	241-T-120	20	20/20/20	100	F
241-21	241-T-121	21	21/21/21	100	F
241-22	241-T-122	22	22/22/22	100	F
241-23	241-T-123	23	23/23/23	100	F
241-24	241-T-124	24	24/24/24	100	F
241-25	241-T-125	25	25/25/25	100	F
241-26	241-T-126	26	26/26/26	100	F
241-27	241-T-127	27	27/27/27	100	F
241-28	241-T-128	28	28/28/28	100	F
241-29	241-T-129	29	29/29/29	100	F
241-30	241-T-130	30	30/30/30	100	F
241-31	241-T-131	31	31/31/31	100	F
241-32	241-T-132	32	32/32/32	100	F
241-33	241-T-133	33	33/33/33	100	F
241-34	241-T-134	34	34/34/34	100	F
241-35	241-T-135	35	35/35/35	100	F
241-36	241-T-136	36	36/36/36	100	F
241-37	241-T-137	37	37/37/37	100	F
241-38	241-T-138	38	38/38/38	100	F
241-39	241-T-139	39	39/39/39	100	F
241-40	241-T-140	40	40/40/40	100	F
241-41	241-T-141	41	41/41/41	100	F
241-42	241-T-142	42	42/42/42	100	F
241-43	241-T-143	43	43/43/43	100	F
241-44	241-T-144	44	44/44/44	100	F
241-45	241-T-145	45	45/45/45	100	F
241-46	241-T-146	46	46/46/46	100	F
241-47	241-T-147	47	47/47/47	100	F
241-48	241-T-148	48	48/48/48	100	F
241-49	241-T-149	49	49/49/49	100	F
241-50	241-T-150	50	50/50/50	100	F
241-51	241-T-151	51	51/51/51	100	F
241-52	241-T-152	52	52/52/52	100	F
241-53	241-T-153	53	53/53/53	100	F
241-54	241-T-154	54	54/54/54	100	F
241-55	241-T-155	55	55/55/55	100	F
241-56	241-T-156	56	56/56/56	100	F
241-57	241-T-157	57	57/57/57	100	F
241-58	241-T-158	58	58/58/58	100	F
241-59	241-T-159	59	59/59/59	100	F
241-60	241-T-160	60	60/60/60	100	F
241-61	241-T-161	61	61/61/61	100	F
241-62	241-T-162	62	62/62/62	100	F
241-63	241-T-163	63	63/63/63	100	F
241-64	241-T-164	64	64/64/64	100	F
241-65	241-T-165	65	65/65/65	100	F
241-66	241-T-166	66	66/66/66	100	F
241-67	241-T-167	67	67/67/67	100	F
241-68	241-T-168	68	68/68/68	100	F
241-69	241-T-169	69	69/69/69	100	F
241-70	241-T-170	70	70/70/70	100	F
241-71	241-T-171	71	71/71/71	100	F
241-72	241-T-172	72	72/72/72	100	F
241-73	241-T-173	73	73/73/73	100	F
241-74	241-T-174	74	74/74/74	100	F
241-75	241-T-175	75	75/75/75	100	F
241-76	241-T-176	76	76/76/76	100	F
241-77	241-T-177	77	77/77/77	100	F
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241-84	241-T-184	84	84/84/84	100	F
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241-86	241-T-186	86	86/86/86	100	F
241-87	241-T-187	87	87/87/87	100	F
241-88	241-T-188	88	88/88/88	100	F
241-89	241-T-189	89	89/89/89	100	F
241-90	241-T-190	90	90/90/90	100	F
241-91	241-T-191	91	91/91/91	100	F
241-92	241-T-192	92	92/92/92	100	F
241-93	241-T-193	93	93/93/93	100	F
241-94	241-T-194	94	94/94/94	100	F
241-95	241-T-195	95	95/95/95	100	F
241-96	241-T-196	96	96/96/96	100	F
241-97	241-T-197	97	97/97/97	100	F
241-98	241-T-198	98	98/98/98	100	F
241-99	241-T-199	99	99/99/99	100	F
241-100	241-T-200	100	100/100/100	100	F

241-T-FARM WELLS

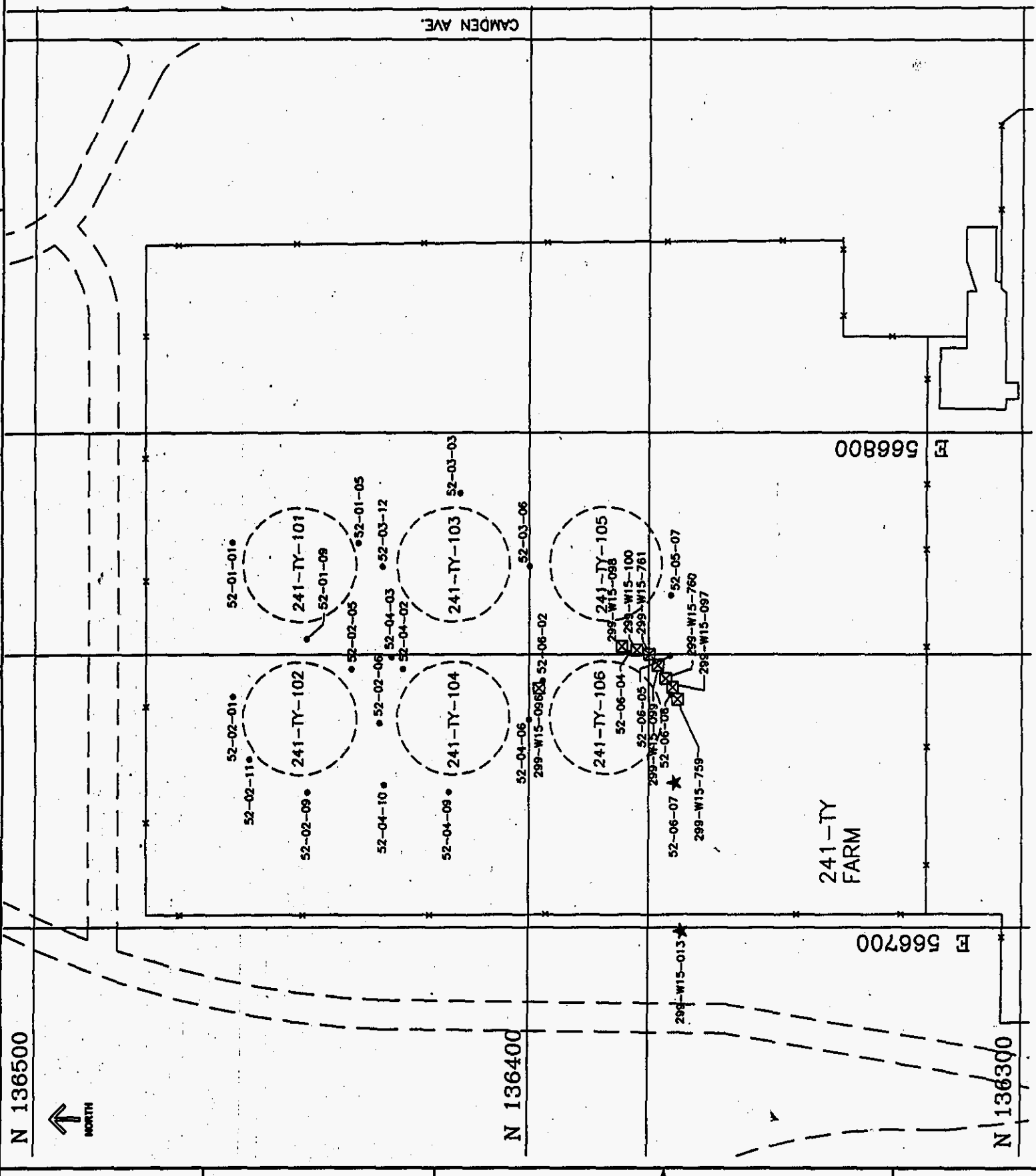
FARM #	WELL NUMBER	STATE #	DATE Installed	DEPTH	TYPE
241-101	241-T-101	01	01/01/01	100	F
241-102	241-T-102	02	02/02/02	100	F
241-103	241-T-103	03	03/03/03	100	F
241-104	241-T-104	04	04/04/04	100	F
241-105	241-T-105	05	05/05/05	100	F
241-106	241-T-106	06	06/06/06	100	F
241-107	241-T-107	07	07/07/07	100	F
241-108	241-T-108	08	08/08/08	100	F
241-109	241-T-109	09	09/09/09	100	F
241-110	241-T-110	10	10/10/10	100	F
241-111	241-T-111	11	11/11/11	100	F
241-112	241-T-112	12	12/12/12	100	F
241-113	241-T-113	13	13/13/13	100	F
241-114	241-T-114	14	14/14/14	100	F
241-115	241-T-115	15	15/15/15	100	F
241-116	241-T-116	16	16/16/16	100	F
241-117	241-T-117	17	17/17/17	100	F
241-118	241-T-118	18	18/18/18	100	F
241-119	241-T-119	19	19/19/19	100	F
241-120	241-T-120	20	20/20/20	100	F
241-121	241-T-121	21	21/21/21	100	F
241-122	241-T-122	22	22/22/22	100	F
241-123	241-T-123	23	23/23/23	100	F
241-124	241-T-124	24	24/24/24	100	F
241-125	241-T-125	25	25/25/25	100	F
241-126	241-T-126	26	26/26/26	100	F
241-127	241-T-127	27	27/27/27	100	F
241-128	241-T-128	28	28/28/28	100	F
241-129	241-T-129	29	29/29/29	100	F
241-130	241-T-130	30	30/30/30	100	F
241-131	241-T-131	31	31/31/31	100	F
241-132	241-T-132	32	32/32/32	100	F
241-133	241-T-133	33	33/33/33	100	F
241-134	241-T-134	34	34/34/34	100	F
241-135	241-T-135	35	35/35/35	100	F
241-136	241-T-136	36	36/36/36	100	F
241-137	241-T-137	37	37/37/37	100	F
241-138	241-T-138	38	38/38/38	100	F
241-139	241-T-139	39	39/39/39	100	F
241-140	241-T-140	40	40/40/40	100	F
241-141	241-T-141	41	41/41/41	100	F
241-142	241-T-142	42	42/42/42	100	F
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241-144	241-T-144	44	44/44/44	100	F
241-145	241-T-145	45	45/45/45	100	F
241-146	241-T-146	46	46/46/46	100	F
241-147	241-T-147	47	47/47/47	100	F
241-148	241-T-148	48	48/48/48	100	F
241-149	241-T-149	49	49/49/49	100	F
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241-152	241-T-152	52	52/52/52	100	F
241-153	241-T-153	53	53/53/53	100	F
241-154	241-T-154	54	54/54/54	100	F
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241-156	241-T-156	56	56/56/56	100	F
241-157	241-T-157	57	57/57/57	100	F
241-158	241-T-158	58	58/58/58	100	F
241-159	241-T-159	59	59/59/59	100	F
241-160	241-T-160	60	60/60/60	100	F
241-161	241-T-161	61	61/61/61	100	F
241-162	241-T-162	62	62/62/62	100	F
241-163	241-T-163	63	63/63/63	100	F
241-164	241-T-164	64	64/64/64	100	F
241-165	241-T-165	65	65/65/65	100	F
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241-171	241-T-171	71	71/71/71	100	F
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241-180	241-T-180	80	80/80/80	100	F
241-181	241-T-181	81	81/81/81	100	F
241-182	241-T-182	82	82/82/82	100	F
241-183	241-T-183	83	83/83/83	100	F
241-184	241-T-184	84	84/84/84	100	F
241-185	241-T-185	85	85/85/85	100	F
241-186	241-T-186	86	86/86/86	100	F
241-187	241-T-187	87	87/87/87	100	F
241-188	241-T-188	88	88/88/88	100	F
241-189	241-T-189	89	89/89/89	100	F
241-190	241-T-190	90	90/90/90	100	F
241-191	241-T-191	91	91/91/91	100	F
241-192	241-T-192	92	92/92/92	100	F
241-193	241-T-193	93	93/93/93	100	F
241-194	241-T-194	94			

241-TY FARM WELLS						
FARM#	WELL NUMBER	STATE#	DATE Installed	Diag	Depth	TYPE
				In	ft	
52-01-01	299-W10-088	A7178	12/10/71	6	100	F
52-01-05	299-W10-089	A7179	12/08/71	6	100	F
52-01-08	299-W10-090	A7180	12/17/71	6	100	F
52-02-01	299-W10-091	A7181	11/23/71	6	100	F
52-02-03	299-W10-092	A7182	12/17/71	6	100	F
52-02-06	299-W10-171	A7254	08/31/47	6	100	F
52-02-08	299-W10-093	A7183	12/14/71	6	100	F
52-02-11	299-W10-161	A7245	05/15/75	6	100	F
52-03-03	299-W10-095	A7185	07/09/77	6	100	F
52-03-08	299-W10-096	A7186	12/09/71	6	100	F
52-03-12	299-W10-094	A7184	11/21/78	6	100	F
52-04-02	299-W10-097	A7187	12/14/71	6	100	F
52-04-03	299-W10-083	A7173	08/19/52	6	150	D
52-04-06	299-W10-098	A7188	12/07/71	6	100	F
52-04-08	299-W10-099	A7189	12/10/71	6	100	F
52-04-10	299-W10-082	A7172	08/15/52	6	150	D
52-05-07	299-W15-186	A7484	08/08/74	6	100	F
52-06-02	299-W10-106	A7180	NA	6	66	F
52-06-04	299-W15-185	A7483	08/12/74	6	100	F
52-06-05	299-W15-079	A7380	09/25/52	6	150	D
52-06-06	299-W15-184	A7482	08/14/74	6	100	F
52-06-07	299-W15-103	A4828	08/10/73	6	238	B2
NA	299-W15-013	A4918	08/05/73	6	225	B2
NA	299-W15-096	A7385	01/01/81	6	72	I
NA	299-W15-097	A7386	01/01/81	2	70	I
NA	299-W15-098	A7387	01/01/81	2	70	I
NA	299-W15-099	A7388	01/01/81	2	70	I
NA	299-W15-100	A7389	01/01/81	2	70	I
NA	299-W15-759	E2758	01/01/81	2	70	I
NA	299-W15-760	E2760	01/01/81	2	70	I
NA	299-W15-761	E2761	01/01/81	2	70	I

SYMBOL LEGEND

- ★ PRIORITY 1 WELLS
- ▲ PRIORITY 2 WELLS
- PRIORITY 3 WELLS
- ☒ DECOMMISSION WELLS- NO ACTION REQD

GENERAL NOTES:
 COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.



241-TY TANK FARM

NAME	U.S. DEPARTMENT OF ENERGY
ADDRESS	CIVIL / ENVIR WELLS
	241-TY FARM
	ES-050051-C3 D

REV. NO.	DATE	DESCRIPTION

241-U FARM WELLS

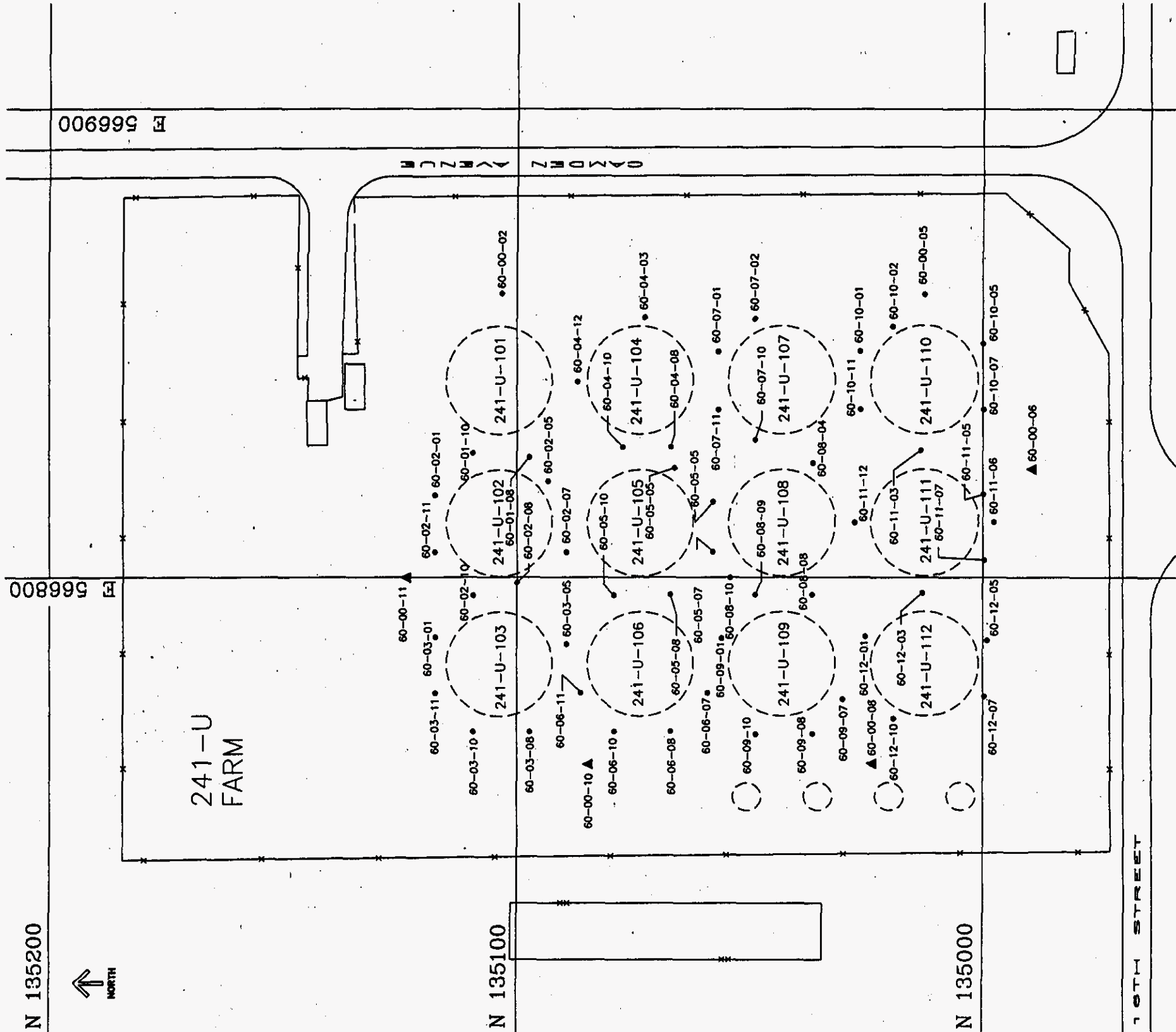
Table with columns: WELL NUMBER, SITE#, STATE#, DATE Installed, Dwg Depth, DATE, TYPE. Lists well identifiers like 60-00-02, 60-00-05, etc., and their details.

GENERAL NOTES:

1. COORDINATES ARE REFERENCED TO WASHINGTON STATE GRID SYSTEM.

SYMBOL LEGEND

- Priority 1 Wells (star symbol)
Priority 2 Wells (triangle symbol)
Priority 3 Wells (circle symbol)
Decommission Well - No Action Req'd (square symbol)



241-U TANK FARM

U.S. DEPARTMENT OF ENERGY
CIVIL / ENVIR WELLS
241-U FARM
ES-050051-C3.0

Table with columns: Dwg No, Title, References, Next Used On, Revisions.

ATTACHMENT III
SURFACE WATER ASSESSMENT

ENGINEERING STUDY

**SURFACE WATER CONTROL
FOR
SINGLE-SHELL TANK FARMS
INTERIM MEASURES TO LIMIT
INFILTRATION THROUGH THE VADOSE ZONE**

October 1999

Subcontract LMHC 96WO-0006

Prepared by

**Fluor Daniel Northwest
Richland, Washington**

Prepared for

Lockheed Martin Hanford Corporation

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APPENDICES

- Appendix A. Decision Matrix
- Appendix B. Cost Estimates
- Appendix C. Photos
- Appendix D. Sketches

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 any water added to the soil column contributes to the continued migration of this 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, water line ruptures, 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 essentially 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 substantially 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: surface water run-on occurring from adjacent areas; variations in the tank farm surface contours, including obstructions on and adjacent to the tank farms; and 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 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 runoff. The building, with the appropriate options, may 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 assessment. Combined with the recommendations contained in the water line assessment study and the well assessment study, Alternative 5 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 \$231 million. Proposing an alternative that costs over \$200 million may not be practical at Hanford considering the potential reductions in funding and the many high priority projects required across the site. Alternatives 3 and 4 (geo-fabric liner and asphalt pavement, respectively) provide a substantial reduction in infiltration into the vadose zone. 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 increase in cost (approximately \$176 million), the cost-to-benefit ratio is so high that it is evident that Alternative 5 is not a practical recommendation.

Following installation of run-on control barriers (Alternative 6), as part of a RCRA CMS, a risk analysis should be performed of which 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) 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 farm 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.

This study presents methods to reduce or eliminate ponding and infiltration of surface water into the various tank farms.

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 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 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.

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 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 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 of 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 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 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 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 tanks 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 farm will be routed toward existing discharge points within the tank farm boundaries. Collection basins/settling ponds will not be required.
- 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. Following are guidelines and specifications that set forth engineering requirements deemed necessary for safe design, construction, and operation of the surface water control facilities.

- DOE Order 5480.28 *Natural Phenomena Hazards Mitigation*
- DOE Order 5420.2A *Radioactive Waste Management*
- HNF-PRO-097 *Engineering Design and Evaluation*
- WAC 173-303-640 *Dangerous Waste Regulations, Tank Systems*
- WHC-IP-1043 *WHC Occupational ALARA Program*
- WHC-SD-GN-DGS-30011 *Radiological Design Guide*
- WHC-CM-4-46 *Safety Classification of Structures, Systems, and Components*
- HNF-SD-WM-BIO-001 *Basis for Interim Operations*

5.1.3 REQUIREMENTS

The requirements herein 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 specified in OSD-T-151-00013 (WHC 1996a) and HNF-IP-1266, chapter 5-16.
- Maintenance activities associated with any of the alternatives should be minimized or eliminated.

5.2 ALTERNATIVES CONSIDERED

A wide range of acceptable alternatives has been considered to ensure that the chosen alternative is 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) and act somewhat like a sponge, 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 of the existing soil has to be removed and then reinstalled 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 6 in. 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 provided. 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 6 in. 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 however tend 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, 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 tanks, plus 10 m 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 and prevents surface water from flowing onto the tank farm from adjacent areas and would be implemented on all farms. The barrier primarily consists 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 away from the surface water control area. In two cases, adjacent to B and U Tank Farms, catch basins and piping would be utilized to divert water flow around and under existing process pipe berms, see Appendix D, sheet 19.

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 III-6.1-1 for a comparison of the advantages and disadvantages for the surface water assessment alternatives.

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 III-6.4-1 provides a summary of the cost information for each alternative and the cost estimate is included in Appendix B.

Table III-6.1-1

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: \$1M	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: \$55.8M	Substantial reduction in infiltration	Hand excavation required for installation
	Objectives of engineering study achieved	Excavated soil may be contaminated and require removal.
	Proven technology	Costs assume 50% removal.
4. Asphalt Concrete Paving	Semi-impervious surface barrier is proven technology	Heat retention in summer.
Estimated cost: \$22.7M		All paving placed 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% removal.
5. Building Enclosure with Asphalt Apron	Eliminates infiltration	Foundation may affect underground utilities
Estimated cost: \$231M	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	Eliminate run-on to SST farms	Objectives of engineering study not fully achieved
Estimated cost: \$300K	Does not disturb contaminated soil, or farm activities	
	Installation may use motorized equipment	

Table III-6.4-1

SURFACE WATER CONTROL COST INFORMATION SUMMARY

TANK FARM	Alt 2: SITE GRADING	Alt 3: GEO FABRIC LINER	Alt 4: ASPHALT CONCRETE PAVING	Alt 5: BUILDING ENCLOSURE WITH ASPHALT APRON	Alt 6: RUN-ON CONTROL
A	\$57,300	\$3,990,000	\$1,530,000	\$11,870,000	\$18,700
AX	\$41,500	\$2,890,000	\$1,110,000	\$7,500,000	\$3,900
B	\$91,200	\$4,260,000	\$1,780,000	\$21,200,000	\$42,300
BX	\$94,100	\$4,450,000	\$1,860,000	\$20,210,000	\$36,300
BY	\$94,100	\$6,530,000	\$2,510,000	\$20,300,000	\$0
C	\$79,600	\$3,760,000	\$1,580,000	\$19,800,000	\$41,300
S	\$94,100	\$4,410,000	\$1,840,000	\$20,210,000	\$33,400
SX	\$106,800	\$5,070,000	\$2,120,000	\$23,030,000	\$30,100
T	\$96,100	\$4,500,000	\$1,880,000	\$20,720,000	\$20,600
TX	\$140,800	\$6,600,000	\$2,760,000	\$31,260,000	\$30,000
TY	\$58,300	\$2,730,000	\$1,140,000	\$11,920,000	\$5,700
U	\$96,100	\$6,640,000	\$2,560,000	\$23,400,000	\$37,700
TOTAL	\$1,050,000	\$55,830,000	\$22,670,000	\$231,420,000	\$300,000

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 the first priority. The low cost of this alternative (\$300,000 for all farms) also makes this 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 farm is accomplished with a building. (Note: a building is not the preferred alternative.) Alternative 5, the building enclosure, appears to provide the safest option, whereby 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 \$231 million. The other two feasible alternatives are a liner (Alternative 3) and asphalt paving (Alternative 4). Their ROM costs are \$56 million and \$22 million, respectively. There is a difference between the alternatives of \$176 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).

Proposing an alternative that costs over \$200 million may not be practical at Hanford considering the potential reductions in funding and the many high priority projects required across the site. 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 increase in cost (approximately \$176 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 (\$56 million versus \$22.5 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 CMS, 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 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 CMS, 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 CHANGES 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 are 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 from the ditch lines. The magnitude of the costs for this activity would be minimal.

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9.2 Contacts

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9.3 Reference Sketches

See the reference block on the engineering sketches.

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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						
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	4/20	3/15	2/10	1/5
	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						
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	4/20	3/15	2/10	2/10
	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							
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						
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	4/20	3/15	2/10	1/5
	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							
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						
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	4/20	3/15	2/10	1/5
	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							
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
	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)							
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-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
	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-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						
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1) CHEMICAL EXPOSURE (4.1.2.2) INDUSTRIAL SAFETY (4.1.2.3)	5	N/A	5/25	4/20	3/15	2/10	1/5
	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							
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)	SCORE/WEIGHTED SCORE						
		NON-RADIATION RELEASES (4.1.1.2)							
	Worker (4.1.2)	RADIATION EXPOSURE (4.1.2.1)	5	N/A	5/25	4/20	3/15	2/10	1/5
		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

SEE GRADING	III-B-1
LINER OPTION	III-B-14
ASPHALT OPTION	III-B-32
BUILDING OPTION	III-B-50
RUN-ON CONTROL	III-B-74

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAE1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHMCRO1 - PROJECT COST SUMMARY

PAGE 1 OF 8
 DATE 08/06/99 13:25:12
 BY XLR/DLG

SORT	DESCRIPTION	ESCALATED	CONTINGENCY		TOTAL
		TOTAL COST	%	TOTAL	DOLLARS
PDNW	FLUOR DANIEL NORTHWEST	665,000	30	200,000	865,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	161,000	30	48,000	209,000
SUBTOTAL		826,000	30	248,000	1,074,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	167,000	30	50,000	217,000
PROJECT TOTAL		993,000	30	298,000	1,291,000

III-B-1

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/6/99	REMARKS:
PDNW LEAD ESTIMATOR	<i>DLML</i>	ESTIMATING MANAGER	<i>[Signature]</i>
PROJECT MANAGER			
CLIENT			

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

FLUOR DANIEL NORTHWEST, INC.
 LOCKISED MARTIN
 JOB NO. 2696
 FILE NO. 2636SAB1

PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

EST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE

PAGE 2 OF 8
 DATE 08/06/99 13:25:19
 BY KLR/DLG

WBS DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION	SUB TOTAL	CONTINGENCY	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
11100 DEFINITIVE DESIGN	53365	0.00	53365	30	69374	16129	85504
SUBTOTAL 11 DEFINITIVE DESIGN	53365	0.00	53365	30	69374	16129	85504
12100 ENGINEERING DURING CONSTRUCTION	26683	0.00	26683	30	34687	8064	42752
SUBTOTAL 12 ENGINEERING DURING CONSTRUCTION	26683	0.00	26683	30	34687	8064	42752
32000 SITE GRADING	585064	0.00	585064	30	760583	152994	913578
SUBTOTAL 32 FIXED PRICE CONSTRUCTION	585064	0.00	585064	30	760583	152994	913578
50000 OPERATING CONTRACTOR (LMHC)	160500	0.00	160500	30	208650	39852	248502
PROJECT TOTAL	825,612	0.00	825,612	30	1,073,296	217,041	1,290,337

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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC 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 FDNW 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 FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 35.2% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT

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 FDNW 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 (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.0%
(3) FDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.0%
(5) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

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DATE 07/07/99 08:33:57
BY KLR/DLG

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
PHMCR03 - ESTIMATE BASIS SHEET

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED-MARTIN
JOB NO. Z696
FILE NO. Z696SAE1

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

5. CONTINGENCY

A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORSEEN 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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAE1

** IRST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

PAGE 5 OF 8
 DATE 08/06/99 13:25:26
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS	
PDNW	FLUOR DANIEL NORTHWEST								
111100	DEFINITIVE DESIGN	53365	0.00	0	30	16009	69374	16129	85504
	SUBTOTAL 11 DEFINITIVE DESIGN	53365	0.00	0	30	16009	69374	16129	85504
121100	ENGINEERING DURING CONSTRUCTION	26683	0.00	0	30	8004	34687	8064	42752
	SUBTOTAL 12 ENGINEERING DURING CONS	26683	0.00	0	30	8004	34687	8064	42752
320002	SITE GRADING	585064	0.00	0	30	175519	760583	152994	913578
	SUBTOTAL 32 FIXED PRICE CONSTRUCTIO	585064	0.00	0	30	175519	760583	152994	913578
	TOTAL PDNW FLUOR DANIEL NORTHWEST	665112	0.00	0	30	199533	864646	177188	1041835
LMHC	LOCKHEED MARTIN HANFORD CORP.								
500000	OPERATING CONTRACTOR (LMHC)	160500	0.00	0	30	48150	208650	39852	248502
	TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	160500	0.00	0	30	48150	208650	39852	248502
PROJECT TOTAL		825,612	0.00	0	30	247,683	1,073,296	217,041	1,290,337

III-B-5

FLUGR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAE1

** 1EST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 6 OF 8
 DATE 08/06/99 13:25:35
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION &	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
-----	-----	-----	-----	-----	-----	-----	-----
111100	DEFINITIVE DESIGN	53365	0.00	0	0	0	53365
	SUBTOTAL 11	53365		0	0	0	53365
121100	ENGINEERING DURING CONSTRUCTION	26683	0.00	0	0	0	26683
	SUBTOTAL 12	80048		0	0	0	80048
320002	SITE GRADING	432740	35.20	152324	0	152324	585064
	SUBTOTAL 32	432740		152324	0	152324	585064
500000	OPERATING CONTRACTOR (LMHC)	160500	0.00	0	0	0	160500

	PROJECT TOTAL	673,288		152,324	0	152,324	825,612

III-B-6

FLUOR DANIEL NORTHWEST, INC.
 LOCKNEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAR1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 DATE 08/06/99 13:26:08
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GPS/G&A CONST.MGMT	FDH MPR F.P./S.C.	FDH GPS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	53365	133	0	0	12273	0	12407
	SUBTOTAL 11 DEFINITIVE DESIGN	53365	133	0	0	12273	0	12407
121100	ENGINEERING DURING CONSTRUCTION	26683	66	0	0	6137	0	6203
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	26683	66	0	0	6137	0	6203
320002	SITE GRADING	432740	0	35034	82653	0	0	117687
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	432740	0	35034	82653	0	0	117687
500000	OPERATING CONTRACTOR (LMHC)	160500	0	0	30655	0	0	30655
PROJECT TOTAL		673,288	200	35,034	113,308	18,411	0	166,954

III-B-7

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAE1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHNCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 8 OF 8
 DATE 08/06/99 13:25:42
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
			%	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	12407	0.00	0	12407	30	3722	16129
	SUBTOTAL 11 DEFINITIVE DESIGN	12407	0.00	0	12407	30	3722	16129
121100	ENGINEERING DURING CONSTRUCTION	6203	0.00	0	6203	30	1861	8064
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	6203	0.00	0	6203	30	1861	8064
320002	SITE GRADING	117687	0.00	0	117687	30	35306	152994
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	117687	0.00	0	117687	30	35306	152994
500000	OPERATING CONTRACTOR (LMHC)	30655	0.00	0	30655	30	9196	39852
PROJECT TOTAL		166,954	0.00	0	166,954	30	50,086	217,041

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAE1

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
 DATE 08/06/99 13:25:57
 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	650 MHR	650	53365	0	0	0	0	0	53365
	10% OF TOTAL CONSTRUCTION COST OF APPROX \$535,000										

SUBTOTAL	HOME OFFICE LABOR			650	53,365	0	0	0	0	0	53,365

TOTAL	COST CODE 00090			650	53,365	0	0	0	0	0	53,365
	WBS 111100										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 111100	DEFINITIVE DESIGN			650	53,365	0	0	0	0	0	53,365

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAE1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 2
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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 5% OF TOTAL CONSTRUCTION COST OF APPROX \$535,000	000	325 MHR	325	26683	0	0	0	0	0	26683

SUBTOTAL	HOME OFFICE LABOR			325	26,683	0	0	0	0	0	26,683

TOTAL	COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			325	26,683	0	0	0	0	0	26,683

TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				325	26,683	0	0	0	0	0	26,683

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAE1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PNMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 3
 DATE 08/06/99 13:25:57
 BY KLR/DLG

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	***** GRADING WITHIN TANK FARMS TO DRAIN WATER OUT OF THE FARM AND STOP WATER FROM POOLING	460	0 SF	0	0	0	0	0	0	0	0
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											432,740
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL NBS 320002 SITE GRADING				0	0	0	0	432,740	0	0	432,740

III-B-11

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAE1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (SITE GRADING)
 ORDER OF MAGNITUDE
 PRMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 4
 DATE 08/06/99 13:25:57
 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 (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX \$535,000	900	1 LS	0	0	0	0	160500	0	0	160500

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	160,500	0	0	160,500

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	160,500	0	0	160,500

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	160,500	0	0	160,500

III-B-12

FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. 2696SAE1

** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (SITE GRADING)
ORDER OF MAGNITUDE
PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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DATE 08/06/99 13:25:57
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				975	80,048	0	0	593,240	0	0	673,288

III-B-13

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 8
 DATE 08/05/99 11:01:56
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED	CONTINGENCY		TOTAL
		TOTAL COST	%	TOTAL	DOLLARS
FDNM	FLUOR DANIEL NORTHWEST	35,730,000	30	10,720,000	46,450,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	9,650,000	30	2,900,000	12,550,000
SUBTOTAL		45,380,000	30	13,620,000	59,000,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE \$100.4)	9,060,000	30	2,720,000	11,780,000
PROJECT TOTAL		54,440,000	30	16,340,000	70,780,000

III-B-14

TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/6/99	REMARKS:	
FDNM LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER		<i>[Signature]</i>
PROJECT MANAGER				
CLIENT				

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

RPP-5002, Rev. 0

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 2 OF 8
 DATE 08/05/99 11:02:03
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS	
111100	DEFINITIVE DESIGN	3218320	0.00	0	30	965496	4183816	972737	5156553
	SUBTOTAL 11 DEFINITIVE DESIGN	3218320	0.00	0	30	965496	4183816	972737	5156553
121100	ENGINEERING DURING CONSTRUCTION	1609160	0.00	0	30	482748	2091908	486368	2578276
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	1609160	0.00	0	30	482748	2091908	486368	2578276
320002	LINER COVER	18834147	0.00	0	30	5650244	24484392	4827291	29311683
320003	INSULATION CUT AND REPAIR	89062	0.00	0	30	26718	115781	22827	138608
320004	WASTE DISPOSAL	11980598	0.00	0	30	3594179	15574777	3070690	18645468
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	30903808	0.00	0	30	9271142	40174951	7920808	48095760
500000	OPERATING CONTRACTOR (LNHC)	9652500	0.00	0	30	2895750	12548250	2396715	14944965
PROJECT TOTAL		45,383,788	0.00	0	30	13,615,136	58,998,925	11,776,630	70,775,555

III-B-15

1. ESTIMATE PURPOSE

=====

PLANNING/FERASIBILITY 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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC 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 FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 18.75% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT

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 FDNW 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
 - (2) FDH GFS/G&A CONST. MGMT: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.0%
 - (3) FDH SUBCONTRACT - G&A/PER RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
 - (4) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.00%
 - (5) FDH G&A OF 19.1% APPLIED TO LHMC PROJECT COSTS.

III-B-16

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

III-B-17

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

PAGE 5 OF 8
 DATE 08/05/99 11:02:11
 BY KLR/DLG

SORT CODE/WBS	DESCRIPTION	ESTIMATE	ESCALATION		SUB	CONTINGENCY		SUB	SITE	TOTAL
		SUBTOTAL	%	TOTAL	TOTAL	%	TOTAL	TOTAL	ALLOCAT'N	DOLLARS

FDNW	FLUOR DANIEL NORTHWEST									
111100	DEFINITIVE DESIGN	3218320	0.00	0	3218320	30	965496	4183816	972737	5156553
	SUBTOTAL 11	3218320	0.00	0	3218320	30	965496	4183816	972737	5156553
121100	ENGINEERING DURING CONSTRUCTION	1609160	0.00	0	1609160	30	482748	2091908	486368	2578276
	SUBTOTAL 12	1609160	0.00	0	1609160	30	482748	2091908	486368	2578276
320002	LINER COVER	18834147	0.00	0	18834147	30	5650244	24484392	4827291	29311683
320003	INSULATION CUT AND REPAIR	89062	0.00	0	89062	30	26718	115781	22827	138608
320004	WASTE DISPOSAL	11980598	0.00	0	11980598	30	3594179	15574777	3070690	18645468
	SUBTOTAL 32	30903808	0.00	0	30903808	30	9271142	40174951	7920808	48095760
	TOTAL FDNW FLUOR DANIEL NORTHWEST	35731288	0.00	0	35731288	30	10719386	46450675	9379914	55830590
LMHC	LOCKHEED MARTIN HANFORD CORP.									
500000	OPERATING CONTRACTOR (LMHC)	9652500	0.00	0	9652500	30	2895750	12548250	2396715	14944965
	TOTAL LMHC LOCKHEED MARTIN HANFORD CORP	9652500	0.00	0	9652500	30	2895750	12548250	2396715	14944965

PROJECT TOTAL		45,383,788	0.00	0	45,383,788	30	13,615,136	58,998,925	11,776,630	70,775,555

III-B-18

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IRST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 6 OF 8
 DATE 08/05/99 11:02:18
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
111100	DEFINITIVE DESIGN	3218320	0.00	0	0	0	3218320
	SUBTOTAL 11	3218320		0	0	0	3218320
121100	ENGINEERING DURING CONSTRUCTION	1609160	0.00	0	0	0	1609160
	SUBTOTAL 12	4827480		0	0	0	4827480
320002	LINER COVER	15860335	18.75	2973812	0	2973812	18834147
320003	INSULATION CUT AND REPAIR	75000	18.75	14062	0	14062	89062
320004	WASTE DISPOSAL	10088925	18.75	1891673	0	1891673	11980598
	SUBTOTAL 32	26024260		4879548	0	4879548	30903808
500000	OPERATING CONTRACTOR (LMHC)	9652500	0.00	0	0	0	9652500
PROJECT TOTAL		40,504,240		4,879,548	0	4,879,548	45,383,788

III-B-19

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

PAGE 7 OF 8
 DATE 08/05/99 11:02:45
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	PDH GFS/G&A CONST.MGMT	PDH MPR P.P./S.C.	PDH GFS/G&A LABOR	PDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	3218320	8045	0	0	740213	0	748259
	SUBTOTAL 11 DEFINITIVE DESIGN	3218320	8045	0	0	740213	0	748259
121100	ENGINEERING DURING CONSTRUCTION	1609160	4022	0	0	370106	0	374129
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	1609160	4022	0	0	370106	0	374129
320002	LINER COVER	15860335	0	683976	3029323	0	0	3713300
320003	INSULATION CUT AND REPAIR	75000	0	3234	14325	0	0	17559
320004	WASTE DISPOSAL	10088925	0	435084	1926984	0	0	2362069
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	26024260	0	1122296	4970633	0	0	6092929
500000	OPERATING CONTRACTOR (LMHC)	9652500	0	0	1843627	0	0	1843627
PROJECT TOTAL		40,504,240	12,068	1,122,296	6,814,261	1,110,320	0	9,058,946

III-B-20

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 8 OF 8
 DATE 08/05/99 11:02:25
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB		CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL		%	TOTAL	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	748259		0.00	0	748259		30	224477	972737
	SUBTOTAL 11 DEFINITIVE DESIGN	748259		0.00	0	748259		30	224477	972737
121100	ENGINEERING DURING CONSTRUCTION	374129		0.00	0	374129		30	112238	486368
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	374129		0.00	0	374129		30	112238	486368
320002	LINER COVER	3713300		0.00	0	3713300		30	1113990	4827291
320003	INSULATION CUT AND REPAIR	17559		0.00	0	17559		30	5267	22827
320004	WASTE DISPOSAL	2362069		0.00	0	2362069		30	708620	3070690
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	6092929		0.00	0	6092929		30	1827878	7920808
500000	OPERATING CONTRACTOR (LMHC)	1843627		0.00	0	1843627		30	553088	2396715
PROJECT TOTAL		9,058,946		0.00	0	9,058,946		30	2,717,683	11,776,630

III-B-21

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
 DATE 08/05/99 11:02:33
 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	39200 MHR	39200	3218320	0	0	0	0	0	3218320
	10% OF TOTAL CONSTRUCTION COST OF APPROX \$32,175,000										
SUBTOTAL	HOME OFFICE LABOR			39,200		0	0	0	0	0	
					3,218,320						3,218,320
TOTAL	COST CODE 00090			39,200		0	0	0	0	0	
	WBS 111100				3,218,320		0		0		3,218,320
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 111100	DEFINITIVE DESIGN			39,200		0	0	0	0	0	
					3,218,320						3,218,320

III-B-22

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 2
 DATE 08/05/99 11:02:33
 BY KLR/DLG

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 5% OF TOTAL CONSTRUCTION COST OF APPROX \$32,175,000	000	19600	MHR	19600	1609160	0	0	0	0	1609160	
SUBTOTAL HOME OFFICE LABOR					19,600		0	0	0	0		
						1,609,160	0	0	0	0	1,609,160	
TOTAL COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)					19,600		0	0	0	0	0	1,609,160
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION					19,600		0	0	0	0	0	1,609,160
						1,609,160	0	0	0	0	1,609,160	

III-B-23

FLUGR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 3
 DATE 08/05/99 11:02:33
 BY KLR/DLG

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
320002.0700005	***** WORK STEPS INCLUDED IN UNIT PRICE: 1. EXCAVATION @ \$95/CY (1') 2. ADD'L COST TO EXCAVATE AROUND CONDUITS- \$10/CY	460	0	0	0	0	0	0	0	0	0
320002.0700006	3. GRADING FOR DRAINAGE @ \$3.00/SY	460	0	0	0	0	0	0	0	0	0
320002.0700008	4. SURVEY/STAKING @ \$10,000	460	0	0	0	0	0	0	0	0	0
320002.0700010	5. LINER TYPE TBD @ \$2.00/SF 6. MOB/DEMO@ \$7500 7. TRAINING/BADGING @ \$1000 8. RADIATION PROTECTION ALLOWANCE @ \$40,000	460	0	0	0	0	0	0	0	0	0
320002.0700012	9. ADDITIONAL CRUSHED GRAVEL \$25/TON 10. COLLECTION/DRAINAGE PIPING @ \$40/LF TOTAL UNIT PRICE- \$7.27/SF *****	460	0	0	0	0	0	0	0	0	0
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

III-B-24

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 4
 DATE 08/05/99 11:02:33
 BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002.0700114	241-S FARM- LINER *****	460	194000 SF	0	0	0	0	1410380	0	0	1410380
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		15,860,335		0	
					0			0			15,860,335

TOTAL	COST CODE 46007			0		0		15,860,335		0	
	WBS 320002				0			0			15,860,335
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										

TOTAL WBS 320002	LINER COVER			0		0		15,860,335		0	
					0			0			15,860,335

III-B-25

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAB1

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 5
 DATE 08/05/99 11:02:33
 BY KLR/DLG

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

III-B-26

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMC08 - 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
320003.0700122	241-TX FARM***** REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER LINER IS INSTALLED	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700124	241-TY FARM***** 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	75,000	0	0	75,000
TOTAL COST CODE 46007					0	0	0	75,000	0	0	75,000
WBS 320003											
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 320003 INSULATION CUT AND REPAIR					0	0	0	75,000	0	0	75,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 7
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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
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
	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	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	0	10,088,925	0	0	10,088,925

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 8
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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
TOTAL	COST CODE 46007			0		0	10,088,925			0	
	WBS 320004				0		0		0		10,088,925
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 320004 WASTE DISPOSAL				0		0	10,088,925			0	10,088,925

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAB1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (LINER OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 9
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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
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX \$32,175,000	900	1 LS	0	0	0	0	9652500	0	0	9652500
SUBTOTAL OTHER COST AND FEES				0	0	0	0	9,652,500	0	0	9,652,500
TOTAL COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)				0	0	0	0	9,652,500	0	0	9,652,500
TOTAL WBS 500000 OPERATING CONTRACTOR (LMHC)				0	0	0	0	9,652,500	0	0	9,652,500

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FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. Z696
FILE NO. Z696SAB1

** IBST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (LINER OPTION)
ORDER OF MAGNITUDE
PHMCR08 - ESTIMATE DETAIL BY MBS / 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
REPORT TOTAL				58,800		0	35,676,760		0		40,504,240

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

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 DATE 08/05/99 10:07:05
 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED	CONTINGENCY		TOTAL
		TOTAL COST	%	TOTAL	DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	14,510,000	30	4,350,000	18,860,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	3,900,000	30	1,170,000	5,070,000
SUBTOTAL		18,410,000	30	5,520,000	23,930,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	3,670,000	30	1,100,000	4,770,000
PROJECT TOTAL		22,080,000	30	6,620,000	28,700,000

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TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/5/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	
PROJECT MANAGER	<i>[Signature]</i>		
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING).

PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SAA1

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 DATE 08/05/99 10:07:12
 BY KLR/DLG

** TEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE

WBS DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
111100 DEFINITIVE DESIGN	1297180	0.00	0	1297180	30	389154	1686334	392072	2078406
SUBTOTAL 11 DEFINITIVE DESIGN	1297180	0.00	0	1297180	30	389154	1686334	392072	2078406
121100 ENGINEERING DURING CONSTRUCTION	648590	0.00	0	648590	30	194577	843167	196036	1039203
SUBTOTAL 12 ENGINEERING DURING CONSTRUC	648590	0.00	0	648590	30	194577	843167	196036	1039203
320002 ASPHALT SURFACING	8834172	0.00	0	8834172	30	2650251	11484424	2264244	13748668
320003 INSULATION CUT & REPAIR	89062	0.00	0	89062	30	26718	115781	22827	138608
320004 WASTE DISPOSAL	3642478	0.00	0	3642478	30	1092743	4735221	933586	5668807
SUBTOTAL 32 FIXED PRICE CONSTRUCTION	12565712	0.00	0	12565712	30	3769713	16335426	3220658	195556085
500000 OPERATING CONTRACTOR (LMHC)	3900000	0.00	0	3900000	30	1170000	5070000	968370	6038370
PROJECT TOTAL	18,411,482	0.00	0	18,411,482	30	5,523,444	23,934,927	4,777,137	28,712,065

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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC 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 FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 18.75% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT

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 FDNW 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGMT: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.00%
- (3) FDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
- (4) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.00%
- (5) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS

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FILE NO. Z696SAA1

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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 REQUIRING 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 BOUNDARY.
- F.) ALL EXCAVATION BY HAND. COMPACTION OF ASPHALT BY SMALL WALK-BEHIND ROLLERS AND PLATE COMPACTORS.
- G.) ESTIMATE BASIS FOR THE LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SA1

.. TEST - INTERACTIVE ESTIMATING ..
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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 DATE 08/05/99 10:07:19
 BY KLR/DLG

CODE/WBS	DESCRIPTION	ESTIMATE	ESCALATION	SUB	CONTINGENCY	SUB	SITE	TOTAL
		TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	ALLOCAT.	DOLLARS
FLUOR DANIEL NORTHWEST	11100 DEFINITIVE DESIGN	1297180	0	1297180	389154	1686334	392072	2078406
	SUBTOTAL 11 DEFINITIVE DESIGN	1297180	0	1297180	389154	1686334	392072	2078406
121100 ENGINEERING DURING CONSTRUCTION		648590	0	648590	194577	843167	196036	1039203
	SUBTOTAL 12 ENGINEERING DURING CONS	648590	0	648590	194577	843167	196036	1039203
320002 ASPHALT SURFACING		8834172	0	8834172	2650251	11484424	2264244	13748668
320003 INSULATION CUT & REPAIR		89062	0	89062	26718	115781	22827	138608
320004 WASTE DISPOSAL		3642478	0	3642478	1092743	4735221	933586	5668807
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	12565712	0	12565712	3769713	16335426	3220658	19556085
TOTAL PDW FLUOR DANIEL NORTHWEST		14511482	0	14511482	4353444	18864927	3808767	22673695
LOCKHEED MARTIN HANFORD CORP.								
500000 OPERATING CONTRACTOR (LMHC)		3900000	0	3900000	1170000	5070000	968370	6038370
TOTAL LMHC LOCKHEED MARTIN HANFORD CORP		3900000	0	3900000	1170000	5070000	968370	6038370
PROJECT TOTAL		18,411,482	0	18,411,482	5,523,444	23,934,927	4,777,137	28,712,065

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION MANAGEMENT		OTHER COSTS	SUB TOTAL	TOTAL
			%	TOTAL			
111100	DEFINITIVE DESIGN	1297180	0.00	0	0	0	1297180
	SUBTOTAL 11 DEFINITIVE DESIGN	1297180		0	0	0	1297180
121100	ENGINEERING DURING CONSTRUCTION	648590	0.00	0	0	0	648590
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	1945770		0	0	0	1945770
320002	ASPHALT SURFACING	7439303	18.75	1394869	0	1394869	8834172
320003	INSULATION CUT & REPAIR	75000	18.75	14062	0	14062	89062
320004	WASTE DISPOSAL	3067350	18.75	575128	0	575128	3642478
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	10581653		1984059	0	1984059	12565712
500000	OPERATING CONTRACTOR (LMHC)	3900000	0.00	0	0	0	3900000
PROJECT TOTAL		16,427,423		1,984,059	0	1,984,059	18,411,482

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. 2696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ. USAGE	FDH GPS/G&A CONST. MGMT	FDH MPR P.P./S.C.	FDH GPS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	1297180	3242	0	0	298351	0	301594
	SUBTOTAL 11 DEFINITIVE DESIGN	1297180	3242	0	0	298351	0	301594
121100	ENGINEERING DURING CONSTRUCTION	648590	1621	0	0	149175	0	150797
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	648590	1621	0	0	149175	0	150797
320002	ASPHALT SURFACING	7439303	0	320819	1420906	0	0	1741726
320003	INSULATION CUT & REPAIR	75000	0	3234	14325	0	0	17559
320004	WASTE DISPOSAL	3067350	0	132279	585863	0	0	718143
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	10581653	0	456333	2021095	0	0	2477429
500000	OPERATING CONTRACTOR (LMHC)	3900000	0	0	744900	0	0	744900
PROJECT TOTAL		16,427,423	4,864	456,333	2,765,995	447,527	0	3,674,721

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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 DATE 08/05/99 10:07:33
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB		CONTINGENCY		TOTAL
		SUBTOTAL		%	TOTAL	TOTAL		%	TOTAL	DOLLARS
111100	DEFINITIVE DESIGN	301594		0.00	0	301594		30	90478	392072
	SUBTOTAL 11 DEFINITIVE DESIGN	301594		0.00	0	301594		30	90478	392072
121100	ENGINEERING DURING CONSTRUCTION	150797		0.00	0	150797		30	45239	196036
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	150797		0.00	0	150797		30	45239	196036
320002	ASPHALT SURFACING	1741726		0.00	0	1741726		30	522518	2264244
320003	INSULATION CUT & REPAIR	17559		0.00	0	17559		30	5267	22827
320004	WASTE DISPOSAL	718143		0.00	0	718143		30	215443	933586
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	2477429		0.00	0	2477429		30	743228	3220658
500000	OPERATING CONTRACTOR (LMHC)	744900		0.00	0	744900		30	223470	968370
PROJECT TOTAL		3,674,721		0.00	0	3,674,721		30	1,102,416	4,777,137

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 10% OF TOTAL CONSTRUCTION COST OF APPROX \$13,000,000	000	15800	MHR	15800	1297180	0	0	0	0	1297180
SUBTOTAL HOME OFFICE LABOR					15,800		0	0	0	0	1,297,180
TOTAL COST CODE 00090 WBS 111100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)					15,800		0	0	0	0	1,297,180
TOTAL WBS 111100 DEFINITIVE DESIGN					15,800		0	0	0	0	1,297,180

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 5% OF TOTAL CONSTRUCTION COST OF APPROX \$13,000,000	000	7900 MHR	7900	648590	0	0	0	0	0	648590
SUBTOTAL HOME OFFICE LABOR				7,900	648,590	0	0	0	0	0	648,590
TOTAL COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)				7,900	648,590	0	0	0	0	0	648,590
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				7,900	648,590	0	0	0	0	0	648,590

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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: *****	460	0	0	0	0	0	0	0	0	0
320002.0700006	1. EXCAVATION @ \$90/CY (.3') 2. GRADING FOR DRAINAGE @ \$3.00/SY	460	0	0	0	0	0	0	0	0	0
320002.0700008	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
320002.0700010	6. TRAINING/BADGING @ \$1000 7. RADIATION PROTECTION ALLOWANCE @ \$20,000 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	SP	0	0	0	988900	0	0	988900
320002.0700122	241-TY FARM- ASPHALT *****	460	120000	SP	0	0	0	409200	0	0	409200
320002.0700124	241-U FARM- ASPHALT *****	460	198000	SP	0	0	0	681932	0	0	681932
SUBTOTAL SITE IMPROVEMENTS					0	0	0	7,439,303	0	0	7,439,303
TOTAL COST CODE 46-007 WBS 320002 (ESCALATION 0.00% - CONTINGENCY 30.00 %)					0	0	0	7,439,303	0	0	7,439,303
TOTAL WBS 320002 ASPHALT SURFACING					0	0	0	7,439,303	0	0	7,439,303

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FLUOR DANIEL NORTHWEST, INC.
 LOCKNEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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-S 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-SX 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 241-T FARM*****	460	40 EA	0	0	0	0	10000	0	0	10000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR06 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003.0700122	241-TX FARM***** REMOVE INSULATION @ PIT FOR TIE-IN AND REPLACE AFTER ASPHALT IS INSTALLED	460	15 EA	0	0	0	0	3750	0	0	3750
320003.0700124	241-TY FARM***** 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 (ESCALATION 0.00% - CONTINGENCY 30.00 %)				0	0	0	0	75,000	0	0	75,000
TOTAL WBS 320003 INSULATION CUT & REPAIR				0	0	0	0	75,000	0	0	75,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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. DISPOSE OF 20% OF EXCAVATION AS LLW FOR REMAINING FARMS. *****	460	0	0	0	0	0	0	0	0	0
320004.0700004	***** 1. DISPOSAL COST - \$15/CF 2. HAUL COST- \$ 1/CF *****	460	0	0	0	0	0	0	0	0	0
320004.0700006	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	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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 WBS 320004 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	3,067,350	0	0	3,067,350
TOTAL WBS 320004	WASTE DISPOSAL			0	0	0	0	3,067,350	0	0	3,067,350

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. Z696
 FILE NO. Z696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX \$13,000,000	900	1 LS	0	0	0	0	3900000	0	0	3900000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	3,900,000	0	0	3,900,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	3,900,000	0	0	3,900,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	3,900,000	0	0	3,900,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SAA1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (ASPHALT OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				23,700		0	14,481,653		0		16,427,423
					1,945,770		0				

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCRO1 - PROJECT COST SUMMARY

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 BY KLR/DLG

SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	TOTAL TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	98,770,000	30	29,630,000	128,400,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	6,600,000	30	1,980,000	8,580,000
SUBTOTAL		105,370,000	30	31,610,000	136,980,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	37,100,000	30	11,130,000	48,230,000
PROJECT TOTAL		142,470,000	30	42,740,000	185,210,000

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TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/6/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>[Signature]</i>	ESTIMATING MANAGER	<i>[Signature]</i>
PROJECT MANAGER			
CLIENT			

(ROUNDED/ADJUSTED TO THE NEAREST * 10,000 / 100,000 * - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

RPP-5002, Rev. 0

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS		
111100	DEFINITIVE DESIGN	7126280	0.00	0	7126280	30	2137884	9264164	2153918	11418082
	SUBTOTAL 11	7126280	0.00	0	7126280	30	2137884	9264164	2153918	11418082
121100	ENGINEERING DURING CONSTRUCTION	3563140	0.00	0	3563140	30	1068942	4632082	1076959	5709041
	SUBTOTAL 12	3563140	0.00	0	3563140	30	1068942	4632082	1076959	5709041
320002	BUILDINGS	85659721	0.00	0	85659721	30	25697916	111357638	42736892	154094531
320003	ASPHALT APRON	1914997	0.00	0	1914997	30	574499	2489497	492674	2982171
320004	WASTE DISPOSAL	504395	0.00	0	504395	30	151318	655713	129766	785480
	SUBTOTAL 32	88079114	0.00	0	88079114	30	26423734	114502849	43359333	157862183
500000	OPERATING CONTRACTOR (LMHC)	6600000	0.00	0	6600000	30	1980000	8580000	1638780	10218780
PROJECT TOTAL		105,368,534	0.00	0	105,368,534	30	31,610,560	136,979,095	48,228,991	185,208,086

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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 FDNW 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: LOCKHEED-MARTIN PROJECT COSTS INCLUDING RPT'S, LHMC 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 FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 21.50% 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 23.6% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR CONSTRUCTION MANAGEMENT. A FACTOR OF 20% HAS BEEN APPLIED TO DIRECT CRAFT LABOR FOR GENERAL REQUIREMENTS.
(4) CONSUMABLES ARE ESTIMATED AT 3.4% 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 7% HAS BEEN APPLIED TO DIRECT CRAFT LABOR CREWS.

C. INDIRECT COSTS:

FIXED PRICE CONTRACT 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 FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

(2) FLUOR DANIEL NORTHWEST 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
- (2) FDH GFS/G&A CONST. MGMT: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.0%
- (3) FDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
- (4) FDH GFS/G&A - LABOR: GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR, AND TO FDHWS CONSTRUCTION LABOR.
- (5) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS.

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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 FDH 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.

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FLUOR DANIEL NORTHWEST, INC.
 LOCKNEED-MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** INERT - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR03 - ESTIMATE BASIS SHEET

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- 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 BOUNDARY.
- 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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.
- H.) FOLLOWING ARE ROUGH TOTAL PROJECT COSTS INCLUDING CONSTRUCTION MGT, LMHC SUPPORT, PDH ADDERS & CONTINGENCY FOR EACH FARM TO ADD LIGHTING, VENTILATION AND OVERHEAD BRIDGE CRANE:

FARM	LIGHTING(\$6.00/SP)	VENTILATION(\$0.60/SP)	BRIDGE CRANE
A- FARM	\$ 570,000	\$ 57,000	\$ 900,000
AX-FARM	\$ 360,000	\$ 36,000	\$ 900,000
B- FARM	\$1,050,000	\$105,000	\$1,250,000
BX-FARM	\$ 985,000	\$100,000	\$1,250,000
BY-FARM	\$ 985,000	\$100,000	\$1,250,000
C- FARM	\$ 985,000	\$100,000	\$1,250,000
S- FARM	\$ 985,000	\$100,000	\$1,250,000
SX-FARM	\$1,120,000	\$112,000	\$1,250,000
T- FARM	\$1,010,000	\$100,000	\$1,250,000
TX-FARM	\$1,530,000	\$153,000	\$1,750,000
UY-FARM	\$ 580,000	\$ 58,000	\$ 900,000
V- FARM	\$1,150,000	\$115,000	\$1,750,000
TOTAL	\$11,310,000	\$1,136,000	\$14,950,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR04 - COMPANY/WBS SUMMARY

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SORT CODE/WBS	DESCRIPTION	ESTIMATE		ESCALATION		SUB		CONTINGENCY		SUB		SITE		TOTAL DOLLARS
		SUBTOTAL	%	TOTAL	%	TOTAL	%	TOTAL	%	TOTAL	%	ALLOCAT'N		
FDNW	FLUOR DANIEL NORTHWEST													
111100	DEFINITIVE DESIGN	7126280	0.00	0	7126280	30	2137884	9264164	2153918	11418082				
	SUBTOTAL 11 DEFINITIVE DESIGN	7126280	0.00	0	7126280	30	2137884	9264164	2153918	11418082				
121100	ENGINEERING DURING CONSTRUCTION	3563140	0.00	0	3563140	30	1068942	4632082	1076959	5709041				
	SUBTOTAL 12 ENGINEERING DURING CONS	3563140	0.00	0	3563140	30	1068942	4632082	1076959	5709041				
320002	BUILDINGS	85659721	0.00	0	85659721	30	25697916	111357638	42736892	154094531				
320003	ASPHALT APRON	1914997	0.00	0	1914997	30	574499	2489497	492674	2982171				
320004	WASTE DISPOSAL	504395	0.00	0	504395	30	151318	655713	129766	785480				
	SUBTOTAL 32 FIXED PRICE CONSTRUCTIO	88079114	0.00	0	88079114	30	26423734	114502849	43359333	157862183				
	TOTAL FDNW FLUOR DANIEL NORTHWEST	98768534	0.00	0	98768534	30	29630560	128399095	46590211	174989306				
LMHC	LOCHEED MARTIN HANFORD CORP.													
500000	OPERATING CONTRACTOR (LMHC)	6600000	0.00	0	6600000	30	1980000	8580000	1638780	10218780				
	TOTAL LMHC LOCHEED MARTIN HANFORD CORP	6600000	0.00	0	6600000	30	1980000	8580000	1638780	10218780				
PROJECT TOTAL		105,368,534	0.00	0	105,368,534	30	31,610,560	136,979,095	48,228,991	185,208,086				

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

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WBS	DESCRIPTION	ESTIMATE	CONSTRUCTION MANAGEMENT		OTHER	SUB	TOTAL
		SUBTOTAL	%	TOTAL	COSTS	TOTAL	TOTAL
111100	DEFINITIVE DESIGN	7126280	0.00	0	0	0	7126280
	SUBTOTAL 11 DEFINITIVE DESIGN	7126280		0	0	0	7126280
121100	ENGINEERING DURING CONSTRUCTION	3563140	0.00	0	0	0	3563140
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	10689420		0	0	0	10689420
320002	BUILDINGS	69303982	23.60	16355739	0	16355739	85659721
320003	ASPHALT APRON	1576130	21.50	338867	0	338867	1914997
320004	WASTE DISPOSAL	415140	21.50	89255	0	89255	504395
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	71295252		16783862	0	16783862	88079114
500000	OPERATING CONTRACTOR (LMHC)	6600000	0.00	0	0	0	6600000
PROJECT TOTAL		88,584,672		16,783,862	0	16,783,862	105,368,534

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

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WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GFS/G&A CONST.MGMT	FDH MPR P.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	7126280	17815	0	0	1639044	0	1656860
	SUBTOTAL 11 DEFINITIVE DESIGN	7126280	17815	0	0	1639044	0	1656860
121100	ENGINEERING DURING CONSTRUCTION	3563140	8907	0	0	819522	0	828430
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	3563140	8907	0	0	819522	0	828430
320002	BUILDINGS	69303982	209633	3761820	13237060	2073320	13592698	32874532
320003	ASPHALT APRON	1576130	0	77939	301040	0	0	378980
320004	WASTE DISPOSAL	415140	0	20528	79291	0	0	99820
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	71295252	209633	3860288	13617393	2073320	13592698	33353333
500000	OPERATING CONTRACTOR (LMHC)	6600000	0	0	1260600	0	0	1260600
PROJECT TOTAL		88,584,672	236,356	3,860,288	14,877,993	4,531,886	13,592,698	37,099,223

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PNMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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WBS	DESCRIPTION	SITE ALLOC		ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
		SUBTOTAL		%	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	1656860		0.00	0	1656860	30	497058	2153918
	SUBTOTAL 11 DEFINITIVE DESIGN	1656860		0.00	0	1656860	30	497058	2153918
121100	ENGINEERING DURING CONSTRUCTION	828430		0.00	0	828430	30	248529	1076959
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	828430		0.00	0	828430	30	248529	1076959
320002	BUILDINGS	32874532		0.00	0	32874532	30	9862359	42736892
320003	ASPHALT APRON	378980		0.00	0	378980	30	113694	492674
320004	WASTE DISPOSAL	99820		0.00	0	99820	30	29946	129766
	SUBTOTAL 32 PIXED PRICE CONSTRUCTION	33353333		0.00	0	33353333	30	10006000	43359333
500000	OPERATING CONTRACTOR (LMHC)	1260600		0.00	0	1260600	30	378180	1638780
PROJECT TOTAL		37,099,223		0.00	0	37,099,223	30	11,129,767	48,228,991

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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	86800	MHR	86800	7126280	0	0	0	0	7126280
	10% OF TOTAL CONSTRUCTION COST OF APPROX \$71,300,000										
SUBTOTAL HOME OFFICE LABOR					86,800		0	0	0	0	
						7,126,280	0	0	0	0	7,126,280
TOTAL COST CODE 0Q090					86,800		0	0	0	0	
WBS 111100						7,126,280	0	0	0	0	7,126,280
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 111100 DEFINITIVE DESIGN					86,800		0	0	0	0	
						7,126,280	0	0	0	0	7,126,280

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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 5% OF TOTAL CONSTRUCTION COST OF APPROX \$71,300,000	000	43400	MHR 43400	3563140	0	0	0	0	0	3563140
SUBTOTAL HOME OFFICE LABOR				43,400		0		0		0	
					3,563,140		0		0		3,563,140
TOTAL COST CODE 00090				43,400		0		0		0	
WBS 121100					3,563,140		0		0		3,563,140
(ESCALATION 0.00% - CONTINGENCY 30.00 %)											
TOTAL WBS 121100 ENGINEERING DURING CONSTRUCTION				43,400		0		0		0	
					3,563,140		0		0		3,563,140

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FLOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** BEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MBENT	OH&P / B & I	TOTAL DOLLARS
320002	BUILDINGS										
320002.07	SITE IMPROVEMENTS	460	0	0	0	0	0	0	0	0	0
320002.0700002	BUILDING OPTION										
320002.0700004	UNIT PRICE BASED ON	460	0	0	0	0	0	0	0	0	0
320002.0700006	CLAMSHELL'S STRUCTURES UNIT PRICE RANGE OF \$18-28/SF FOR MATERIAL USE \$28/SF FOR SERIES J BUILDINGS AND \$18/SF FOR SERIES H BUILDINGS	460	0	0	0	0	0	0	0	0	0
320002.0700202	241-A FARM- BUILDING	460	95000 SF	0	0	0	1710000	0	0	85500	1795500
320002.0700204	PURCHASE TYPE H BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	14 LDS	140	5959	1890	19600	0	0	980	28329
320002.0700206	INSTALL BUILDING ON GRADE BEAM. ASSUME 26 BAYS 30 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	30 SH	3360	140616	54000	0	0	0	0	194616
320002.0700208	CLAMSHELL REP DURING INSTALL	460	30 SH	240	18000	0	0	0	0	0	18000
320002.0700211	INSTALL 1280 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	132000 LBS	317	13266	4224	0	0	0	0	17490
320002.0700402	241-AX FARM- BUILDING	460	60000 SF	0	0	0	1080000	0	0	54000	1134000
320002.0700404	PURCHASE TYPE H BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	10 LDS	100	4185	1350	14000	0	0	700	20235
320002.0700406	INSTALL BUILDING ON GRADE BEAM. ASSUME 16 BAYS 18 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	18 SH	2016	84370	12400	0	0	0	0	116770
320002.0700408	CLAMSHELL REP DURING INSTALL	460	18 SH	144	10800	0	0	0	0	0	10800
320002.0700411	INSTALL 980 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	100940 LBS	242	10128	3830	0	0	0	0	13358

FLUOR DANIEL NORTHWEST, INC. ** BEST - INTERACTIVE ESTIMATING **
 LOCKREED MARTIN
 JOB NO. 2696
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 PHMCR08 - ESTIMATE DETAIL BY MBS / COST CODE
 ORDER OF MAGNITUDE
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	USAGE	EQUIP	SUB-	EQUIP-	ORHP	TOTAL
320002.0700412	USE GUEZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15. 4 PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-B PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	64 EA	512	19215	4800	19200	0	0	960	44175
320002.0700602	241-B PARM- BUILDING PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-B PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	174000 SF	0	0	0	4872000	0	0	243600	5115600
320002.0700604	AND OFFLOAD SHIP BUILDING TO SITE	460	26 LDS	260	10881	3510	36400	0	0	1820	52611
320002.0700606	INSTALL BUILDING ON GRADE BEAM. ASSUME 32 BAYS 48 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS CLAMSHELL REP DURING INSTALL 48 SH	460	48 SH	5376	224986	86400	0	0	0	0	311386
320002.0700611	INSTALL 1704 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM USE GUEZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15. 4 PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-BX PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	48 SH	384	28800	0	0	0	0	0	28800
320002.0700612	USE GUEZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15. 4 PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-BX PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	192 EA	1536	57646	14400	57600	0	0	2880	132526
320002.0700802	241-BX PARM- BUILDING PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-BY PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	164000 SF	0	0	0	4592000	0	0	229600	4821600
320002.0700804	SHIP BUILDING TO SITE	460	24 LDS	240	10044	3240	33600	0	0	1680	48564
320002.0700806	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS 45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS CLAMSHELL REP DURING INSTALL 45 SH	460	45 SH	5040	210924	81000	0	0	0	0	291924
320002.0700811	INSTALL 1644 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM USE GUEZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15. 4 PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-BY PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	45 SH	360	27000	0	0	0	0	0	27000
320002.0700812	USE GUEZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15. 4 PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-BY PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	180 EA	1440	54043	13500	54000	0	0	2700	124243
320002.0701002	241-BY PARM- BUILDING PLATES 12. HOLES) 4 BA/SHIFT GROUT IN CABLES WITH ANCHOR 241-BY PARM- BUILDING TYPE J BUILDING AND OFFLOAD SHIP BUILDING TO SITE	460	164000 SF	0	0	0	4592000	0	0	229600	4821600
320002.0701004	SHIP BUILDING TO SITE	460	24 LDS	240	10044	3240	33600	0	0	1680	48564
320002.0701006	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS	460	45 SH	5040	210924	81000	0	0	0	0	291924

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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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										
320002.0701008	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
320002.0701011	INSTALL 1644 LP OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	16991	5419	0	0	0	0	22410
320002.0701012	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	54043	13500	54000	0	0	2700	124243
320002.0701202	241-C FARM- BUILDING *****	460	164000 SF	0	0	0	4592000	0	0	229600	4821600
320002.0701204	TYPE J BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	24 LDS	240	10044	3240	33600	0	0	1680	48564
320002.0701206	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS	460	45 SH	5040	210924	81000	0	0	0	0	291924
	45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS										
320002.0701208	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
320002.0701211	INSTALL 1644 LP OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	16991	5419	0	0	0	0	22410
320002.0701212	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	54043	13500	54000	0	0	2700	124243
320002.0701402	241-S FARM- BUILDING *****	460	164000 SF	0	0	0	4592000	0	0	229600	4821600
320002.0701404	TYPE J BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	24 LDS	240	10044	3240	33600	0	0	1680	48564
320002.0701406	INSTALL BUILDING ON GRADE BEAM. ASSUME 30 BAYS	460	45 SH	5040	210924	81000	0	0	0	0	291924
	45 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS										
320002.0701408	CLAMSHELL REP DURING INSTALL	460	45 SH	360	27000	0	0	0	0	0	27000
320002.0701411	INSTALL 1644 LP OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	169332 LBS	406	16991	5419	0	0	0	0	22410
320002.0701412	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	180 EA	1440	54043	13500	54000	0	0	2700	124243
320002.0701602	241-SX FARM- BUILDING *****	460	187000 SF	0	0	0	5236000	0	0	261800	5497800

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IBST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002.0701604	TYPE J BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	29 LDS	290	12137	3915	40600	0	0	2030	58682
320002.0701606	INSTALL BUILDING ON GRADE BEAM. ASSUME 36 BAYS 54 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	54 SH	6048	253109	97200	0	0	0	0	350309
320002.0701608	CLAMSHELL REP DURING INSTALL	460	54 SH	432	32400	0	0	0	0	0	32400
320002.0701611	INSTALL 1780 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	183340 LBS	440	18414	5867	0	0	0	0	24281
320002.0701612	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	216 EA	1728	64852	16200	64800	0	0	3240	149092
320002.0701802	241-T FARM- BUILDING *****	460	168300 SF	0	0	0	4712400	0	0	235620	4948020
320002.0701804	TYPE J BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	26 LDS	260	10881	3510	36400	0	0	1820	52611
320002.0701806	INSTALL BUILDING ON GRADE BEAM. ASSUME 32 BAYS 48 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	48 SH	5376	224986	86400	0	0	0	0	311386
320002.0701808	CLAMSHELL REP DURING INSTALL	460	48 SH	384	28800	0	0	0	0	0	28800
320002.0701811	INSTALL 1670 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	172010 LBS	413	17284	5504	0	0	0	0	22788
320002.0701812	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	192 EA	1536	57646	14400	57600	0	0	2880	132526
320002.0702002	241-TX FARM- BUILDING *****	460	255000 SF	0	0	0	7140000	0	0	357000	7497000
320002.0702004	TYPE J BUILDING SHIP BUILDING TO SITE AND OFFLOAD	460	38 LDS	380	15903	5130	53200	0	0	2660	76893
320002.0702006	INSTALL BUILDING ON GRADE BEAM. ASSUME 48 BAYS 72 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	72 SH	8064	337478	129600	0	0	0	0	467078
320002.0702008	CLAMSHELL REP DURING INSTALL	460	72 SH	576	43200	0	0	0	0	0	43200
320002.0702011	INSTALL 2180 LF OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	224540 LBS	539	22557	7385	0	0	0	0	29742

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002.0702012	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	288 EA	2304	86469	21600	86400	0	0	4320	198789
320002.0702202	241-TY FARM- BUILDING ***** TYPE H BUILDING	460	96000 SF	0	0	0	1728000	0	0	86400	1814400
320002.0702204	SHIP BUILDING TO SITE AND OFFLOAD	460	14 LDS	140	5859	1890	19600	0	0	980	28329
320002.0702206	INSTALL BUILDING ON GRADE BEAM. ASSUME 25 BAYS 14 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	14 SH	1568	65621	25200	0	0	0	0	90821
320002.0702208	CLAMSHELL REP DURING INSTALL	460	14 SH	112	8400	0	0	0	0	0	8400
320002.0702211	INSTALL 1280 LP OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	131840 LBS	316	13225	4219	0	0	0	0	17444
320002.0702212	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	100 EA	800	30024	7500	30000	0	0	1500	69024
320002.0702402	241-U FARM- BUILDING ***** TYPE J BUILDING	460	192000 SF	0	0	0	5376000	0	0	268800	5644800
320002.0702404	SHIP BUILDING TO SITE AND OFFLOAD	460	29 LDS	290	12137	3915	40600	0	0	2030	58682
320002.0702406	INSTALL BUILDING ON GRADE BEAM. ASSUME 36 BAYS 54 SHIFTS X 14 MEN, 2 CRANES 2 JLG'S, 2 FORKLIFTS	460	54 SH	6048	253109	97200	0	0	0	0	350309
320002.0702408	CLAMSHELL REP DURING INSTALL	460	54 SH	432	32400	0	0	0	0	0	32400
320002.0702411	INSTALL 1810 LP OF GRADE BEAM. ASSUME 14 X 103 BEAM	460	186430 LBS	447	18707	5966	0	0	0	0	24673
320002.0702412	USE GUZZLER AND INSTALL TIEDOWNS (ASSUME AUGER 15' & GROUT IN CABLES WITH ANCHOR PLATES 12" HOLES) 4 EA/SHIFT	460	216 EA	1728	64852	16200	64800	0	0	3240	149092
SUBTOTAL SITE IMPROVEMENTS				86,475		1,190,857		0		2,562,240	
CONSUMABLES 3.40 %					3,684,054		51,244,800		0		58,681,951
SWP 50.00%				43237	1842027		125257				125257
GENERAL FOREMAN 7.00 %				9079	386825						1842027
											386825

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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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 %		27758	1182581						1182581
	SALES TAX	8.00 %					4109604		0		4109604
	OH&P (ON MARKUPS ONLY)									211743	211743
TOTAL	COST CODE 46007			166,550	1,190,857			0		2,773,983	
	WBS 320002				7,095,488		55,479,662		0		66,539,990
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
320002.07	SITE IMPROVEMENTS										
320002.0700210	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1280 LP A-FARM	460 S	132000 LBS	2376	99436	0	46200	0	0	2310	147946
320002.0700410	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 980 LP AX FARM	460 S	100940 LBS	1817	76041	0	35329	0	0	1766	113136
320002.0700610	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1704 LP B FARM	460 S	175512 LBS	3159	132204	0	61429	0	0	3071	196704
320002.0700810	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LP BX FARM	460 S	169332 LBS	3048	127559	0	59266	0	0	2963	189788
320002.0701010	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LP BY FARM	460 S	169332 LBS	3048	127559	0	59266	0	0	2963	189788
320002.0701210	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LP C FARM	460 S	169332 LBS	3048	127559	0	59266	0	0	2963	189788
320002.0701410	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1644 LP S FARM	460 S	169332 LBS	3048	127559	0	59266	0	0	2963	189788
320002.0701610	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1780 LP SX FARM	460 S	183340 LBS	3300	138105	0	64169	0	0	3208	205482
320002.0701810	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM	460 S	172010 LBS	3096	129568	0	60204	0	0	3010	192782

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	1670 LP T FARM										
320002.0702010	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 2180 LP TX FARM	460 S	224540 LBS	4042	169158	0	78589	0	0	3929	251676
320002.0702210	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1280 LP TY FARM	460 S	131840 LBS	2373	99310	0	46144	0	0	2307	147761
320002.0702410	FURNISH AND FABRICATE GRADE BEAM. ASSUME 14 X 103 BEAM 1810 LP U FARM	460 S	186430 LBS	3356	140449	0	65251	0	0	3263	208963
SUBTOTAL SITE IMPROVEMENTS (SHOP)				35,711		0		0		34,716	
	CONSUMABLES 3.40 %				1,494,507		694,379		0		2,223,602
	GENERAL FOREMAN 7.00 %			2499	104615		50813				104615
	GENERAL REQUIREMENTS 20.00 %			7642	319824						319824
	SALES TAX 8.00 %						59615		0		59615
	OH&P (ON MARKUPS ONLY)									5521	5521
TOTAL COST CODE 46007				45,852		0		0		40,237	
WBS 320002 (ESCALATION 0.00% - CONTINGENCY 30.00 %)					1,918,946		804,807		0		2,763,992
TOTAL WBS 320002 BUILDINGS				212,403	1,190,857			0		2,814,220	69,303,982
					9,014,434		56,284,470		0		

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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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	***** ASPHALT PERIMETER AROUND OUTSIDE OF BUILDINGS *****	460	0 SF	0	0	0	0	0	0	0	0
320003.0700004	1. EXCAVATION @ \$90/CY (.3') 2. GRADING FOR DRAINAGE @ \$3.00/SY 3. SURVEY AND STAKING @ \$5000	460	0 SF	0	0	0	0	0	0	0	0
320003.0700006	4. 2 1/2" ASPHALT @ \$100/TON 5. MOB & DEMOB @ \$3500 6. TRAINING/BADGING @ \$1000	460	0 SF	0	0	0	0	0	0	0	0
320003.0700008	7. RADIATION PROTECTION ALLOWANCE @ \$10000 8. WATER COLLECTION/DRAINAGE @ \$15000	460	0 SF	0	0	0	0	0	0	0	0
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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
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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 (ESCALATION 0.00% - 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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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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
	1. DISPOSAL COST - \$15/CF										
	2. HAUL COST - \$1/CF										
320004.0700006	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	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

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
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** IEST - INTERACTIVE ESTIMATING **
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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				0		0		0		415,140
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 320004 WASTE DISPOSAL				0		0		415,140		0	415,140

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FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
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** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (BUILDING OPTION)
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 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.990102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTR. COST (NOT INCLUDING PURCHASE OF THE STRUCTURES) OF \$22000000	900	1 LS	0	0	0	0	6600000	0	0	6600000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	6,600,000	0	0	6,600,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	6,600,000	0	0	6,600,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	6,600,000	0	0	6,600,000

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FLUOR DANIEL NORTHWEST, INC.
 LOCKEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAC1

** IEST - INTERACTIVE ESTIMATING **
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ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
				342,603		1,190,857	8,591,270		2,814,220	
					19,703,854	56,284,470			0	88,584,672

REPORT TOTAL

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR01 - PROJECT COST SUMMARY

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SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	193,000	30	58,000	251,000
LMHC	LOCKHEED MARTIN HANFORD CORP.	48,000	30	14,000	62,000
SUBTOTAL		241,000	30	72,000	313,000
SITE	SITE ALLOCATIONS (ADJUSTED TO MEET DOE 5100.4)	49,000	30	15,000	64,000
PROJECT TOTAL		290,000	30	87,000	377,000

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TYPE OF ESTIMATE	ORDER OF MAGNITUDE	8/6/99	REMARKS:
FDNW LEAD ESTIMATOR	<i>DPK</i>	ESTIMATING MANAGER	<i>[Signature]</i>
PROJECT MANAGER			
CLIENT			

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

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

PAGE 2 OF 8
 DATE 08/05/99 12:47:31
 BY XLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION % TOTAL	SUB TOTAL	CONTINGENCY % TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
111100	DEFINITIVE DESIGN	33579	0.00	0	30	10073	10149	53801
	SUBTOTAL 11 DEFINITIVE DESIGN	33579	0.00	0	30	10073	10149	53801
121100	ENGINEERING DURING CONSTRUCTION	14368	0.00	0	30	4310	4342	23021
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	14368	0.00	0	30	4310	4342	23021
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	144616	0.00	0	30	43384	37205	225207
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	144616	0.00	0	30	43384	37205	225207
500000	OPERATING CONTRACTOR (LMHC)	48000	0.00	0	30	14400	11918	74318
PROJECT TOTAL		240,563	0.00	0	30	72,169	63,616	376,348

III-B-75

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 FDNW 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: LOCKHEED MARTIN COSTS INCLUDING RPT'S, LHMC 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 FDNW 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 DYNACORP HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:

- (1) CONTRACT ADMINISTRATION FACTOR OF 21.5% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING SUPPORT

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 FDNW 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) DYNACORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR;
(2) FDH GFS/G&A CONST. MGMT; GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 23.0%
(3) FDH SUBCONTRACT - G&A/FEE RATE (19.1%) APPLIED TO FIXED PRICE SUBCONTRACTS.
(4) FDH GFS/G&A - LABOR; GFS (3%) AND G&A (19.1%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, 23.00%
(5) FDH G&A OF 19.1% APPLIED TO LMHC PROJECT COSTS

4. ESCALATION

NO ESCALATION WAS INCLUDED BECAUSE PROJECT START DATES ARE NOT KNOWN.

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 LMHC TANK FARM OPERATIONS SUPPORT COSTS ARE DERIVED FROM FISCAL YEAR 2000 ESTIMATES FOR SIMILAR TYPE WORK INSIDE THE TANK FARMS. SUPPLIED BY LMHC.

III-B-77

CODE/MBS	DESCRIPTION	ESTIMATE	ESCALATION	SUB TOTAL	CONTINGENCY	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
11100	DEFINITIVE DESIGN	33579	0.00	33579	10073	43652	10149	53801
12100	ENGINEERING DURING CONSTRUCTION	14368	0.00	14368	4310	18678	4342	23021
12	ENGINEERING DURING CONS	14368	0.00	14368	4310	18678	4342	23021
120001	OUTSIDE FARMS BERM/ASPHALT/DRAIN	144616	0.00	144616	43384	188001	37205	225207
32	FIXED PRICE CONSTRUCTION	144616	0.00	144616	43384	188001	37205	225207
TOTAL PDMM FLOOR DANIEL NORTHWEST		192563	0.00	192563	57769	250332	51697	302030
500000	OPERATING CONTRACTOR (LMHC)	48000	0.00	48000	14400	62400	11918	74318
TOTAL LMHC OPERATING CONTRACTOR (LMHC)		48000	0.00	48000	14400	62400	11918	74318
PROJECT TOTAL		240,563	0.00	240,563	72,169	312,732	63,616	376,348

FLOOR DANIEL NORTHWEST, INC. ** FIRST - INTERACTIVE ESTIMATING **
 LOCKHEED MARTIN INTERIM REMEDIAL ACTIONS (RUM-ON CONTROL)
 JOB NO. 2696 ORDER OF MAGNITUDE
 FILE NO. 2696SADI PHMCR04 - COMPANY/MBS SUMMARY
 PAGE 5 OF 8 DATE 08/05/99 12:47:38
 BY KLR/DLG

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

PAGE 6 OF 8
 DATE 08/05/99 12:47:45
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION % MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
111100	DEFINITIVE DESIGN	33579	0.00	0	0	33579
SUBTOTAL 11 DEFINITIVE DESIGN		33579		0	0	33579
121100	ENGINEERING DURING CONSTRUCTION	14368	0.00	0	0	14368
SUBTOTAL 12 ENGINEERING DURING CONSTRUC		47947		0	0	47947
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	21.50	25590	0	144616
SUBTOTAL 32 FIXED PRICE CONSTRUCTION		119026		25590	0	144616
500000	OPERATING CONTRACTOR (LMHC)	48000	0.00	0	0	48000
PROJECT TOTAL		214,973		25,590	0	240,563

III-B-79

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR06 - SITE ALLOCATIONS BY WBS

PAGE 7 OF 8
 DATE 08/05/99 12:48:10
 BY KLR/DLG

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ. USAGE	PDH GPS/G&A CONST. MGMT	PDH MPR P.P./S.C.	PDH GPS/G&A LABOR	PDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
111100	DEFINITIVE DESIGN	33579	83	0	0	7723	0	7807
	SUBTOTAL 11 DEFINITIVE DESIGN	33579	83	0	0	7723	0	7807
121100	ENGINEERING DURING CONSTRUCTION	14368	35	0	0	3304	0	3340
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	14368	35	0	0	3304	0	3340
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	119026	0	5885	22733	0	0	28619
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	119026	0	5885	22733	0	0	28619
500000	OPERATING CONTRACTOR (LMHC)	48000	0	0	9168	0	0	9168
PROJECT TOTAL		214,973	119	5,885	31,901	11,027	0	48,935

III-B-80

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

PAGE 8 OF 8
 DATE 08/05/99 12:47:52
 BY KLR/DLG

WBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION		SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
			%	TOTAL		%	TOTAL	
111100	DEFINITIVE DESIGN	7807	0.00	0	7807	30	2342	10149
	SUBTOTAL 11 DEFINITIVE DESIGN	7807	0.00	0	7807	30	2342	10149
121100	ENGINEERING DURING CONSTRUCTION	3340	0.00	0	3340	30	1002	4342
	SUBTOTAL 12 ENGINEERING DURING CONSTRUC	3340	0.00	0	3340	30	1002	4342
320001	OUTSIDE FARMS BERM/ASPHALT/DRAINAGE	28619	0.00	0	28619	30	8585	37205
	SUBTOTAL 32 FIXED PRICE CONSTRUCTION	28619	0.00	0	28619	30	8585	37205
500000	OPERATING CONTRACTOR (LMHC)	9168	0.00	0	9168	30	2750	11918
PROJECT TOTAL		48,935	0.00	0	48,935	30	14,680	63,616

III-B-81

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. Z696
 FILE NO. Z696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUM-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCRO8 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 1
 DATE 08/05/99 12:48:00
 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	000	409 MHR	409	33579	0	0	0	0	0	33579
	21% OF TOTAL CONSTRUCTION COST OF APPROX \$160,000										
SUBTOTAL HOME OFFICE LABOR				409		0	0	0	0	0	33,579
TOTAL COST CODE 00090				409		0	0	0	0	0	33,579
	WBS 111100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)										
TOTAL WBS 111100 DEFINITIVE DESIGN				409		0	0	0	0	0	33,579

III-B-82

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. Z696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 2
 DATE 08/05/99 12:48:00
 BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
121100	ENGINEERING DURING CONSTRUCTION										
121100.90	HOME OFFICE LABOR										
121100.9000102	ENGINEERING DURING CONSTRUCTION 9% OF TOTAL CONSTRUCTION COST OF APPORX \$160,000	000	175 MHR	175	14368	0	0	0	0	0	14368
SUBTOTAL	HOME OFFICE LABOR			175	14,368	0	0	0	0	0	14,368
TOTAL	COST CODE 00090 WBS 121100 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			175	14,368	0	0	0	0	0	14,368
TOTAL WBS 121100	ENGINEERING DURING CONSTRUCTION			175	14,368	0	0	0	0	0	14,368

DL-B-83

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAD1

** TEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 3
 DATE 08/05/99 12:48:00
 BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIPMENT	OH&P / B & I	TOTAL DOLLARS
320001	OUTSIDE FARMS BERM/ASPALT/DRAINAGE										
320001.02	SITE PREPARATION	460	0	0	0	0	0	0	0	0	0
320001.0200002	BERMS										
320001.0200004	CONSTRUCT BERM & STABILIZE	460	5246 LP	0	0	0	0	73969	0	0	73969
320001.0200006	ASPHALT CURBING	460	0	0	0	0	0	0	0	0	0
320001.0200008	PLACE GRAVEL & ASPHALT	460	4390 SF	0	0	0	0	13170	0	0	13170
320001.0200010	DRAINAGE SYSTEM	460	0	0	0	0	0	0	0	0	0
320001.0200012	PIPING & CATCH BASINS	460	1 LS	0	0	0	0	14000	0	0	14000
320001.0200014	8" PVC PIPE 350 LF 4 EA CATCH BASINS DRAINAGE DITCH	460	0	0	0	0	0	0	0	0	0
320001.0200016	EXCAVATION GRADE/GRAVEL	460	1421 LP	0	0	0	0	7887	0	0	7887
320001.0200018	MISC. CONSTRUCTION	460	0	0	0	0	0	0	0	0	0
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							119,026	0	0	119,026
	TOTAL										
	WBS 320001										
	(ESCALATION 0.00% - CONTINGENCY 30.00 %)										
	TOTAL WBS 320001 OUTSIDE FARMS BERM/ASPALT/DRAINAGE							119,026	0	0	119,026

FLUOR DANIEL NORTHWEST, INC.
 LOCKHEED MARTIN
 JOB NO. 2696
 FILE NO. 2696SAD1

** IEST - INTERACTIVE ESTIMATING **
 INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
 ORDER OF MAGNITUDE
 PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 4
 DATE 08/05/99 12:48:00
 BY KLR/DLG

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
500000	OPERATING CONTRACTOR (LMHC)										
500000.99	OTHER COST AND FEES										
500000.9900102	LMHC PROJECT SUPPORT 30% OF TOTAL CONSTRUCTION COST OF APPROX \$160,000	900	1 LS	0	0	0	0	48000	0	0	48000

SUBTOTAL	OTHER COST AND FEES			0	0	0	0	48,000	0	0	48,000

TOTAL	COST CODE 90099 WBS 500000 (ESCALATION 0.00% - CONTINGENCY 30.00 %)			0	0	0	0	48,000	0	0	48,000

TOTAL WBS 500000	OPERATING CONTRACTOR (LMHC)			0	0	0	0	48,000	0	0	48,000

III-B-85

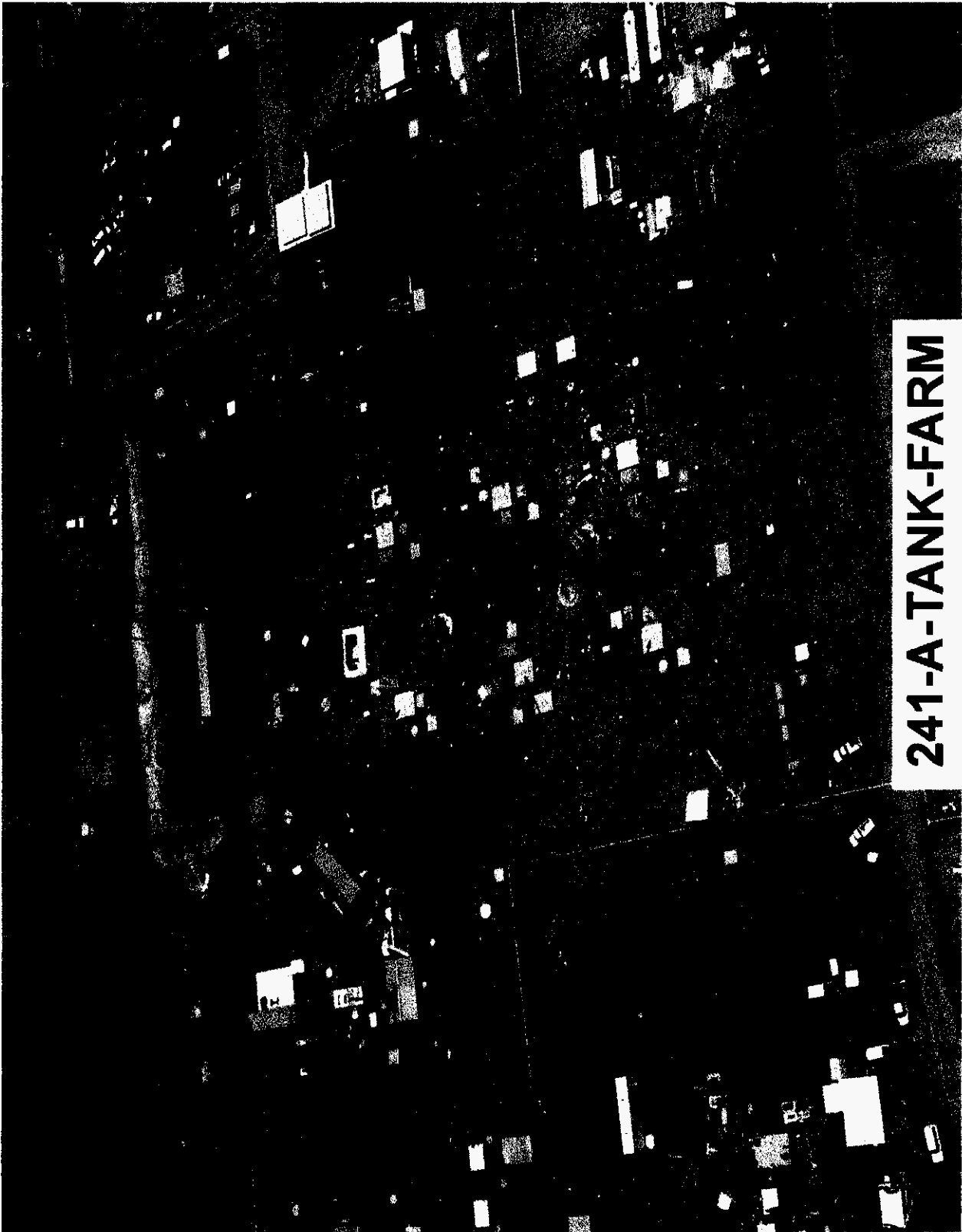
FLUOR DANIEL NORTHWEST, INC.
LOCKHEED MARTIN
JOB NO. 2696
FILE NO. Z696SAD1

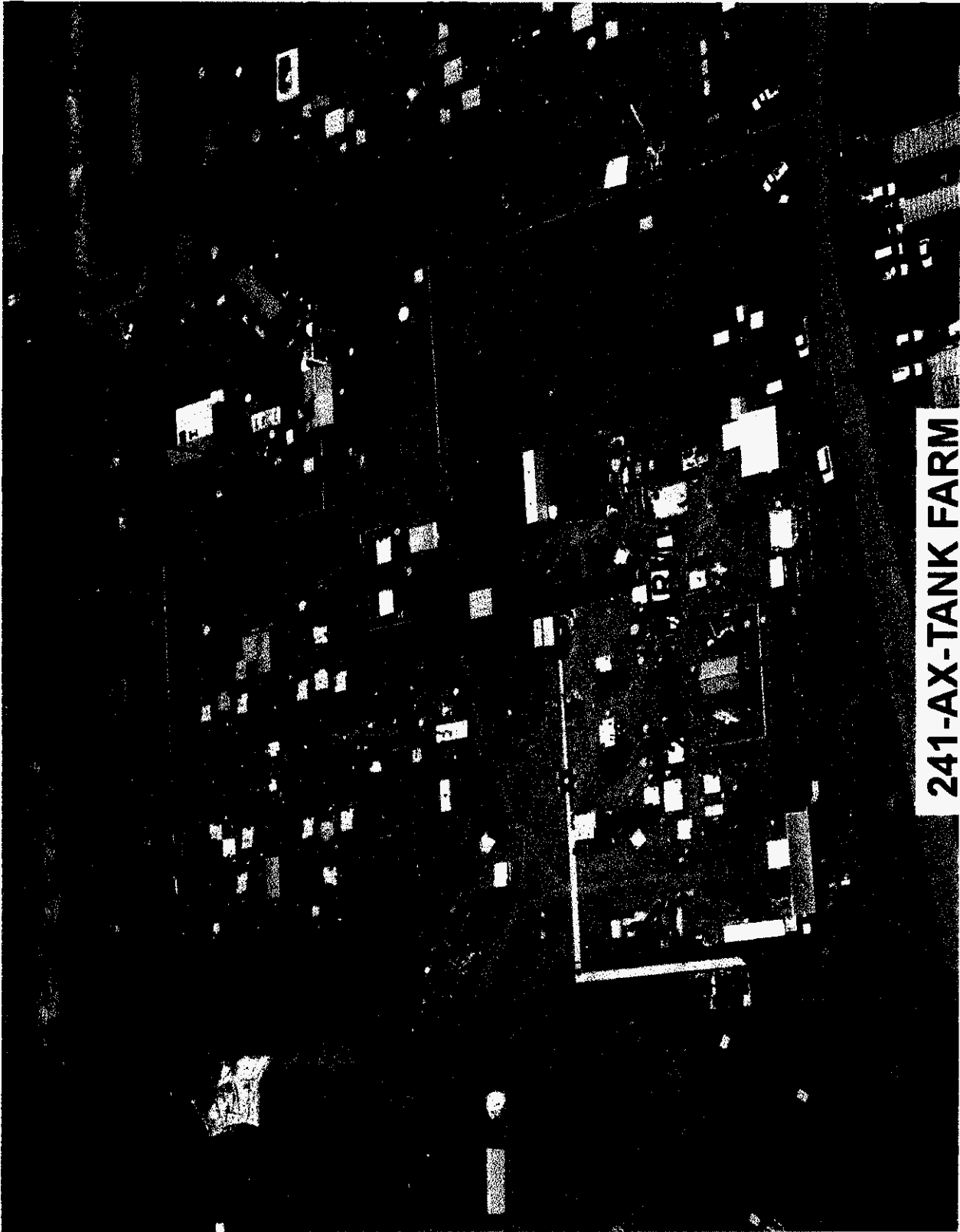
** IEST - INTERACTIVE ESTIMATING **
INTERIM REMEDIAL ACTIONS (RUN-ON CONTROL)
ORDER OF MAGNITUDE
PHMCR00 - ESTIMATE DETAIL BY WBS / COST CODE

PAGE 5
DATE 08/05/99 12:48:00
BY KLR/DLG

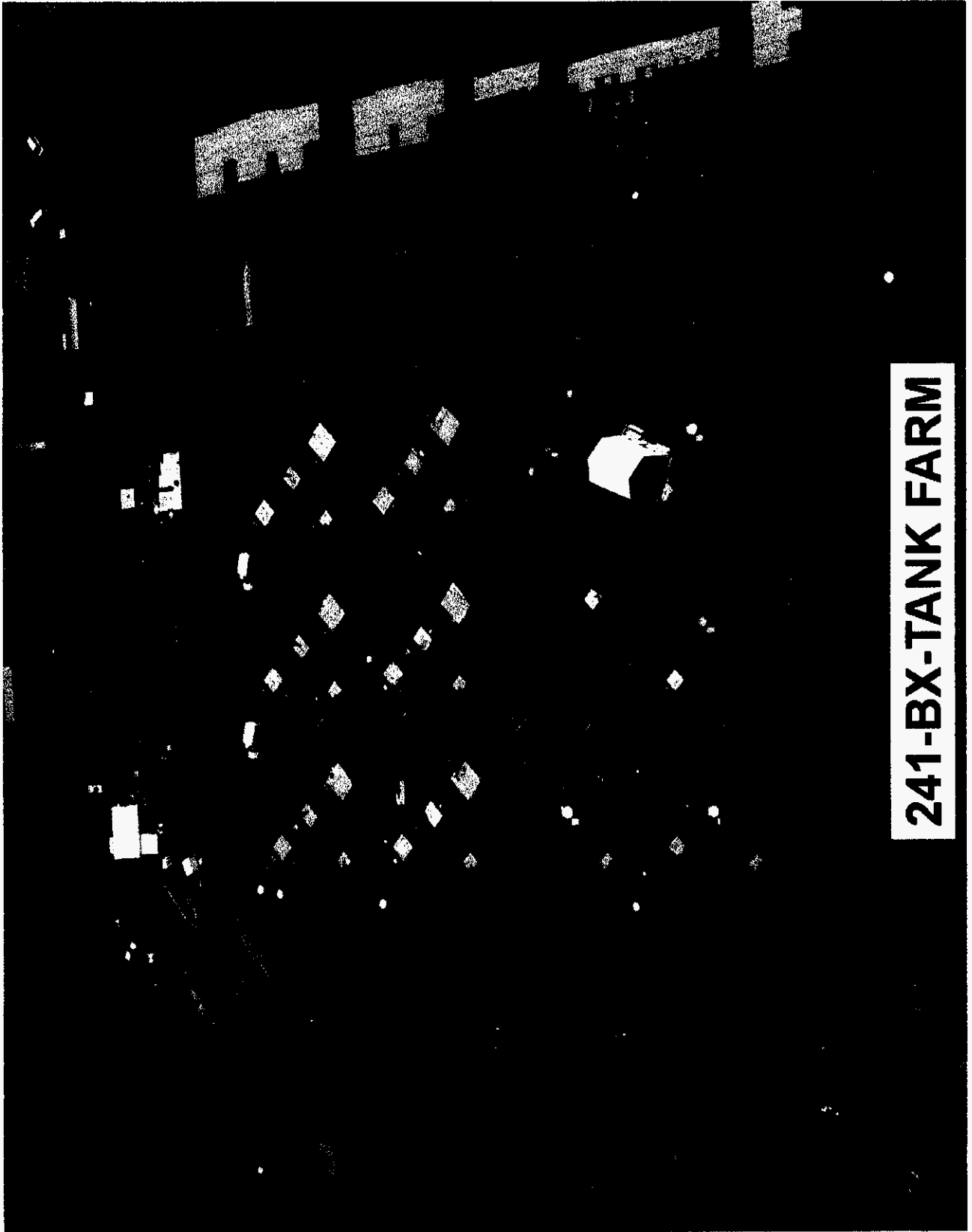
ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				584	47,947	0	0	167,026	0	0	214,973

APPENDIX C
PHOTOS

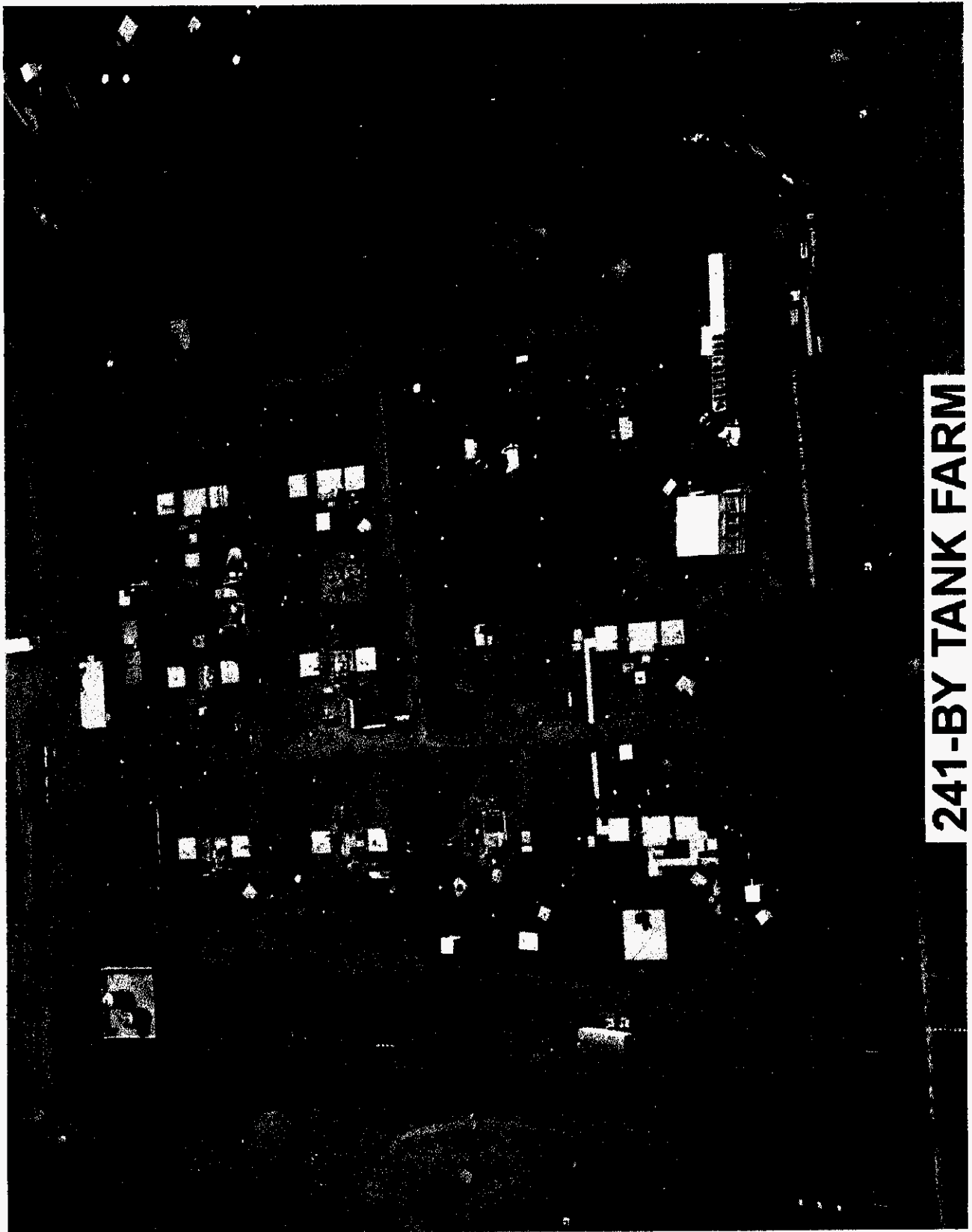


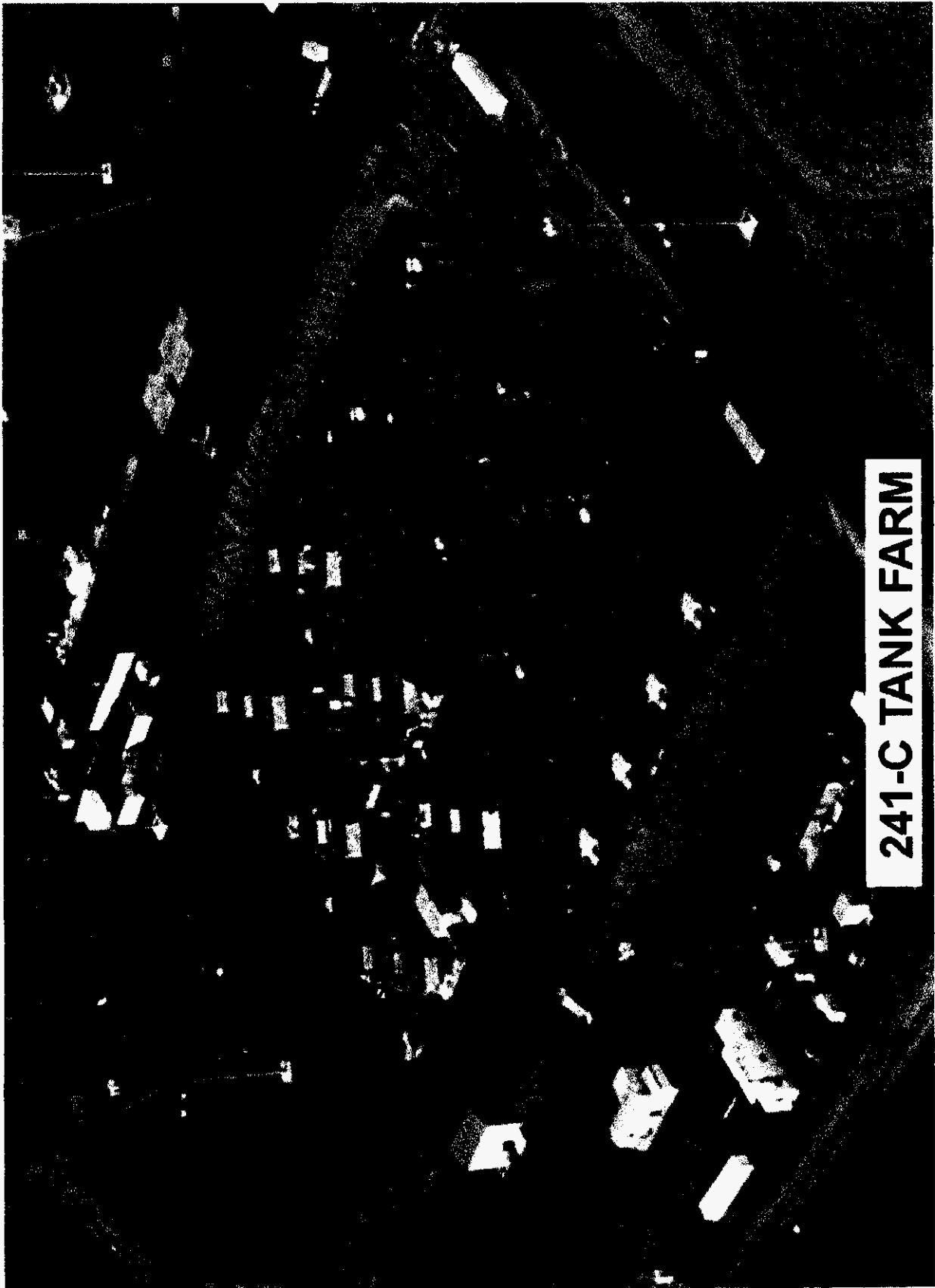




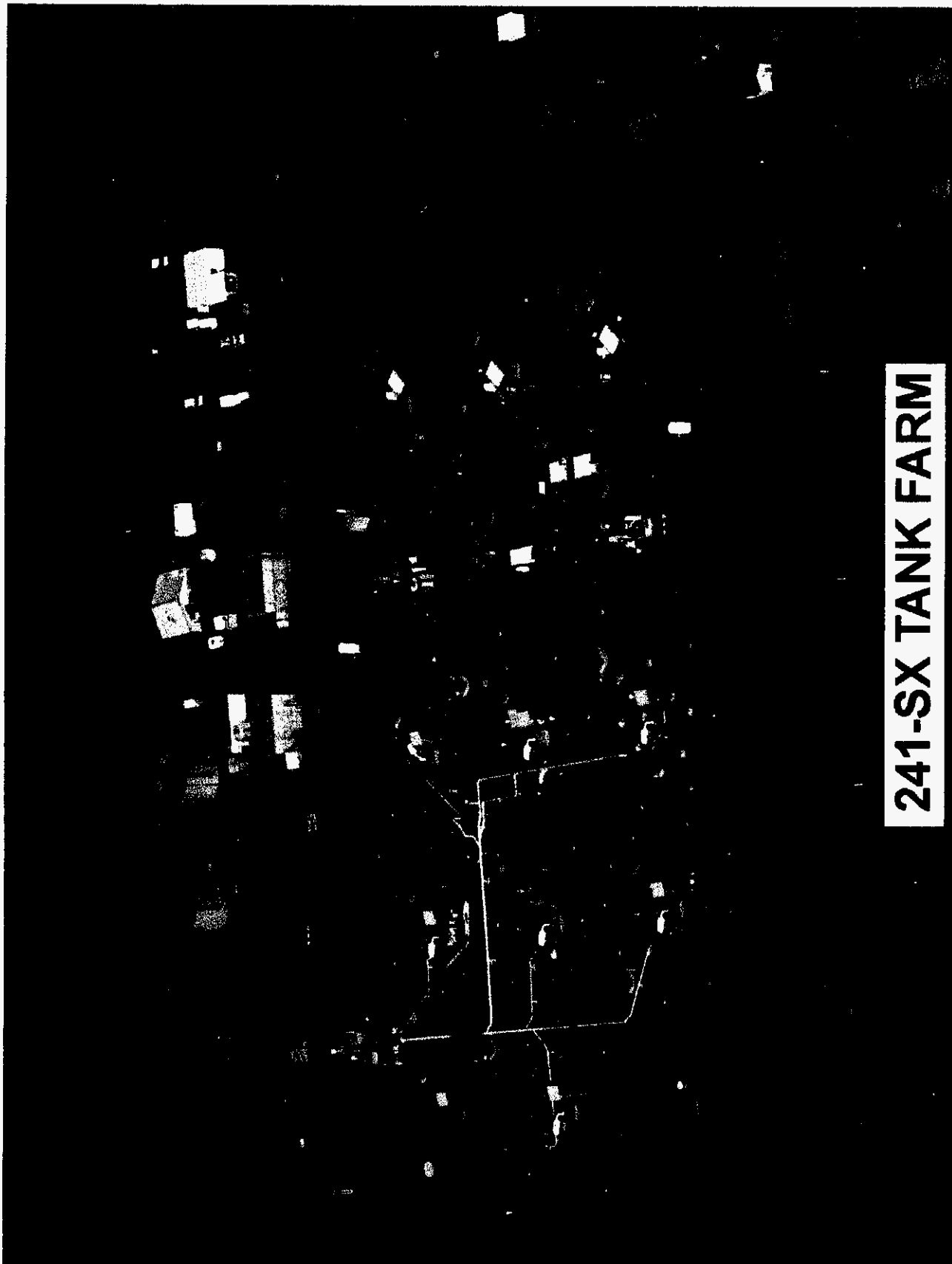


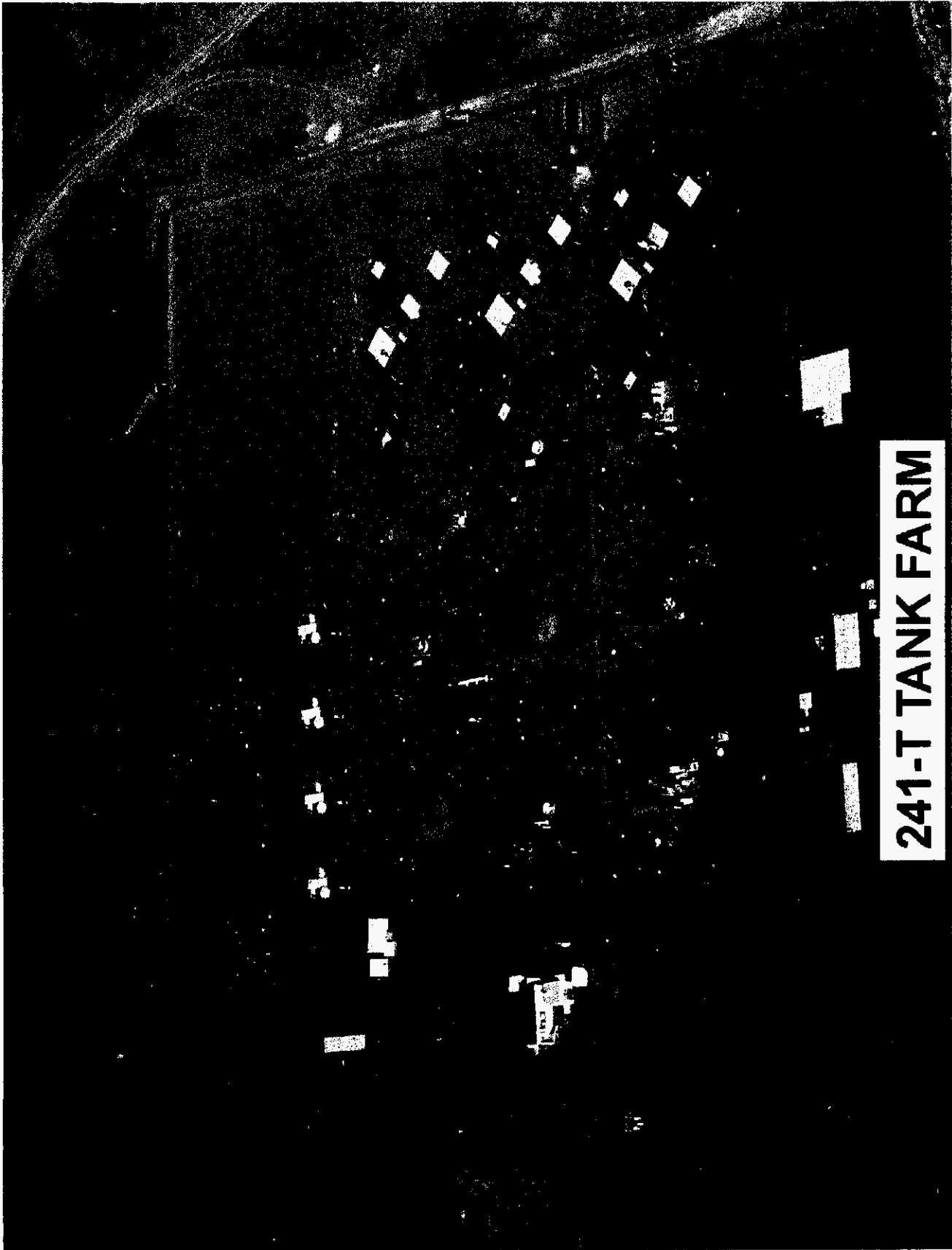
241-BX-TANK FARM

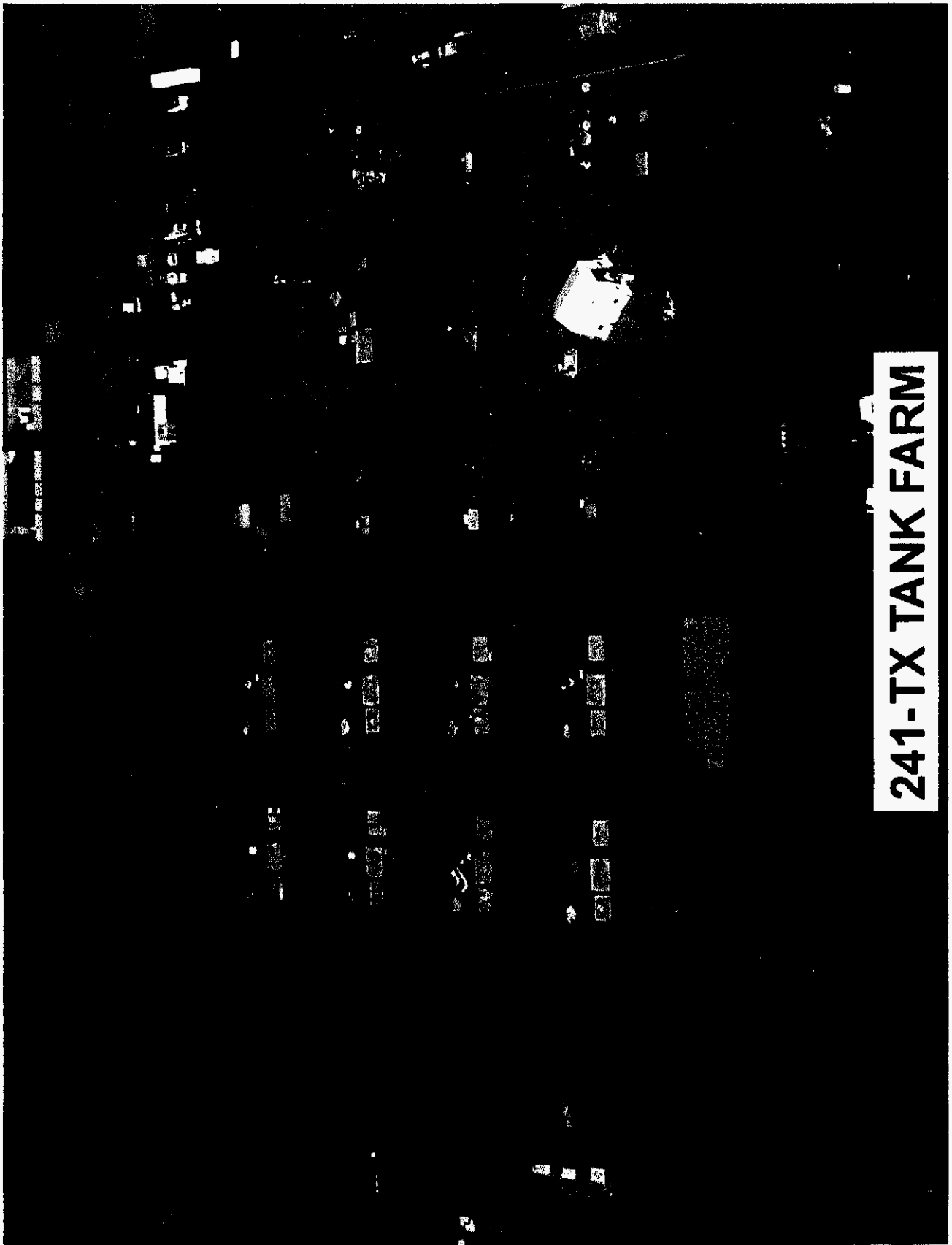


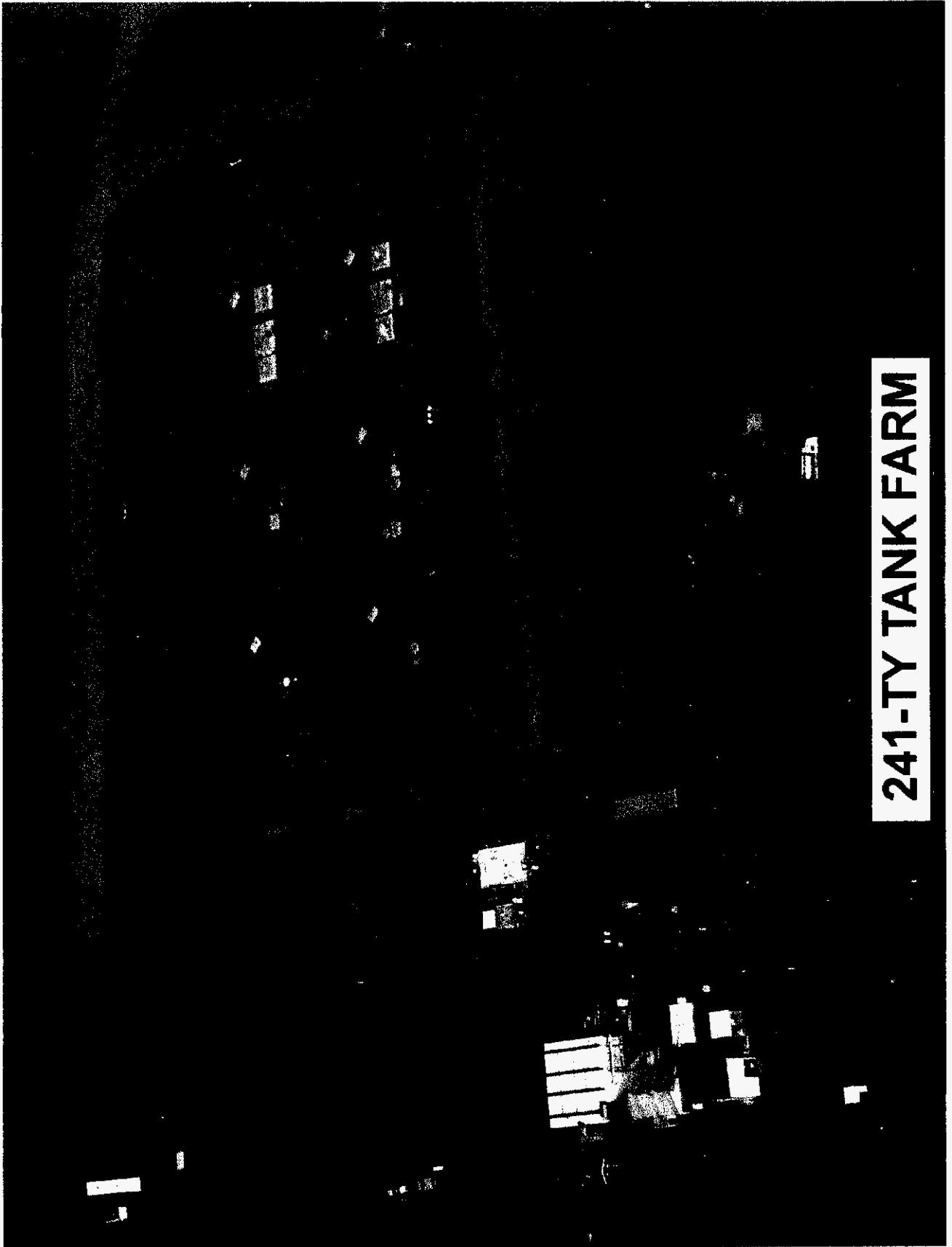


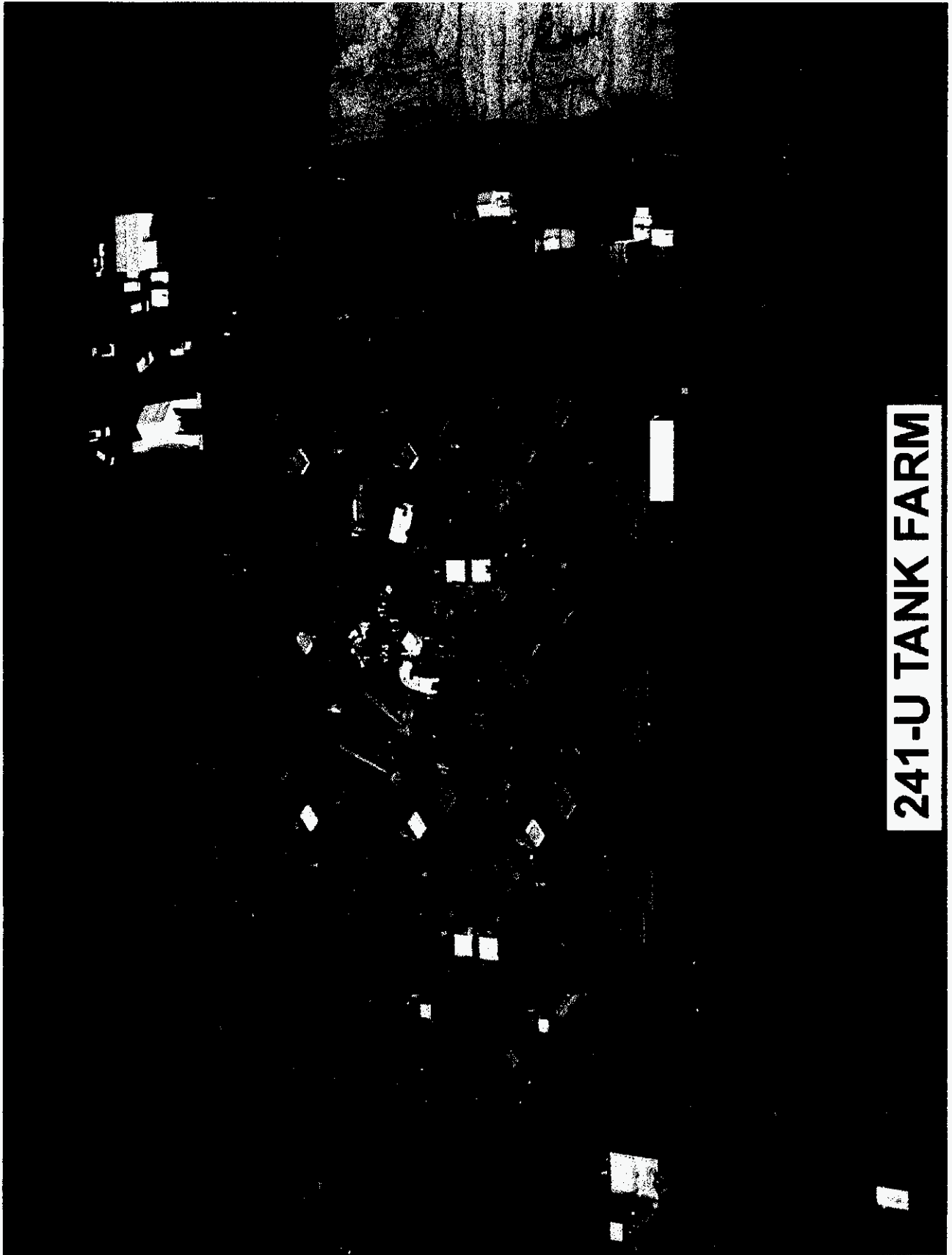




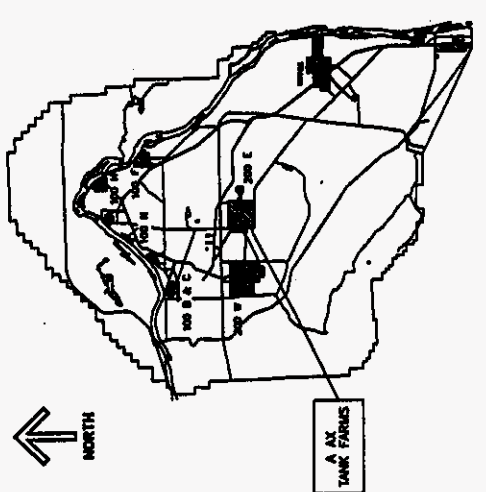








APPENDIX D
SKETCHES



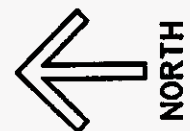
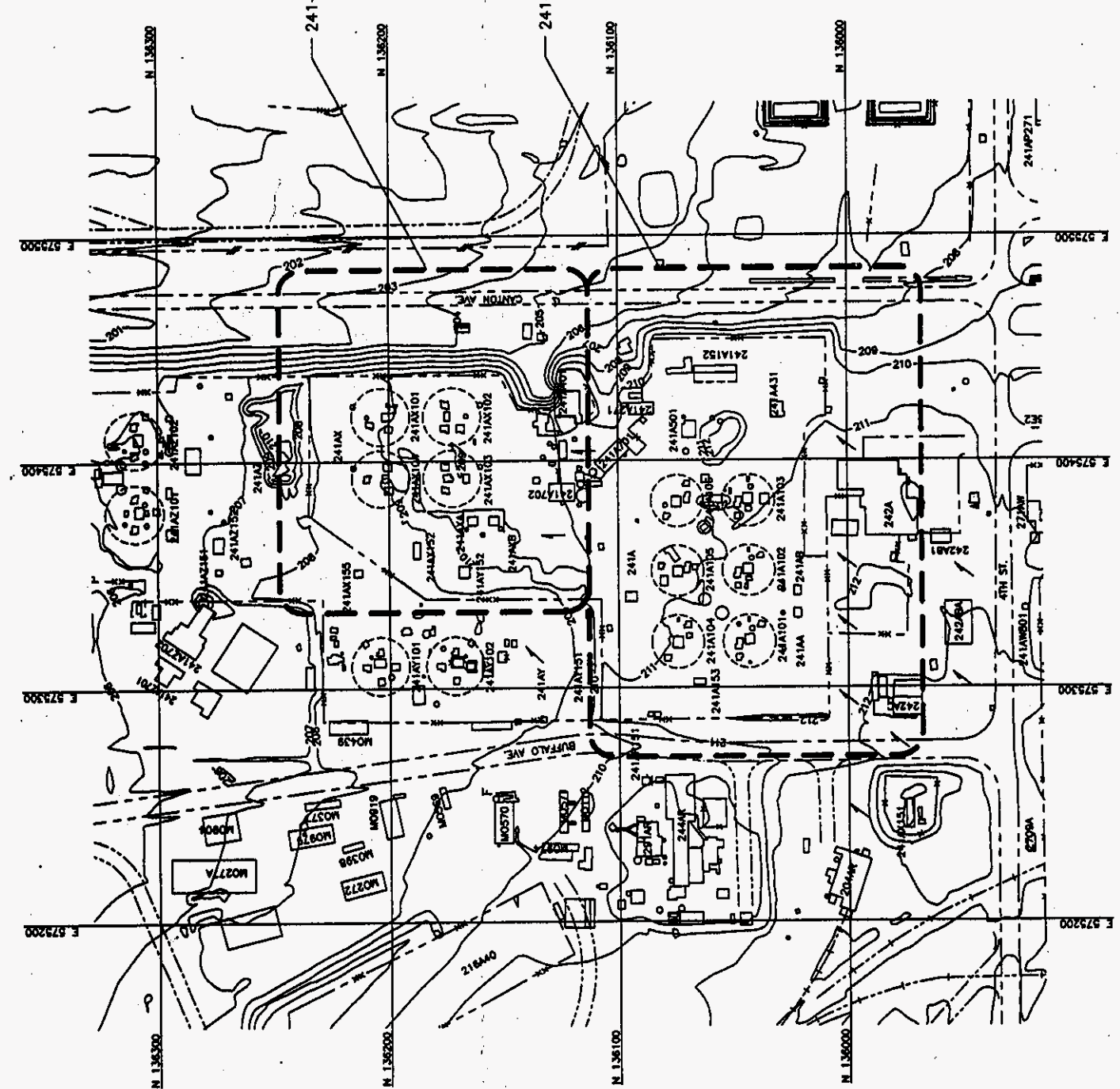
HANFORD RESERVATION

241-AX - SEE ES-050051-C1 SH 3

241-A - SEE ES-050051-C1 SH 2

LEGEND - EXISTING: A

- UNDERGROUND WASTE TANK
- EXISTING GROUND CONTOUR (MAYORS METERS)
- SURFACE DRAINAGE DIRECTION
- GRID LINE (NCSAS391 METERS)
- BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- FENCE



A FARMS COMPLEX









U.S. DEPARTMENT OF ENERGY
Civilian Operations Office

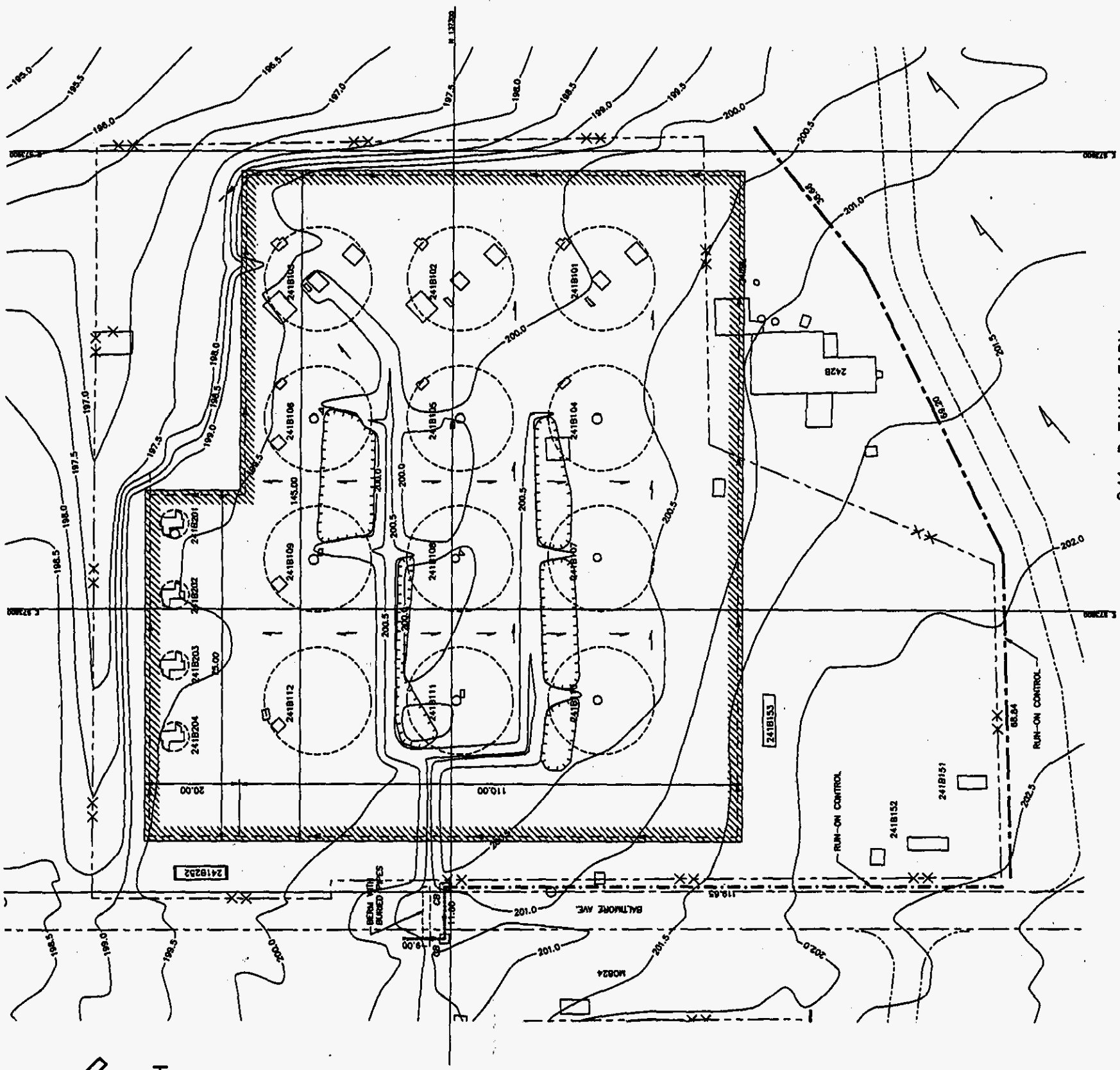
CIVIL/ENVIRONMENTAL
SURFACE WATER CONTROL
A FARMS COMPLEX

DATE	BY	DESCRIPTION
11/20/82	ES-050051-C1	0

DWG NO.	DRAWING TRACEABILITY LIST	TITLE	REV. NUMBER	REVISED ON	TITLE	REVISED ON	MESSAGE

LEGEND - PROPOSED:

-  SURFACE WATER CONTROL AREA
-  SURFACE DRAINAGE DIRECTION
-  SURFACE WATER COLLECTION AREA
-  BERM
-  DRAINAGE DITCH
-  ASPHALT CURB
-  DRAIN TILE
-  CATCH BASIN AND CULVERT



241-B TANK FARM

U.S. DEPARTMENT OF ENERGY	
Civil/Environmental	
SURFACE WATER CONTROL	
241-B TANK FARM	
DATE	01/00
SCALE	1"=50'
PROJECT NO.	ES-050051-C1
REV.	0









NO.	DATE	BY	DESCRIPTION

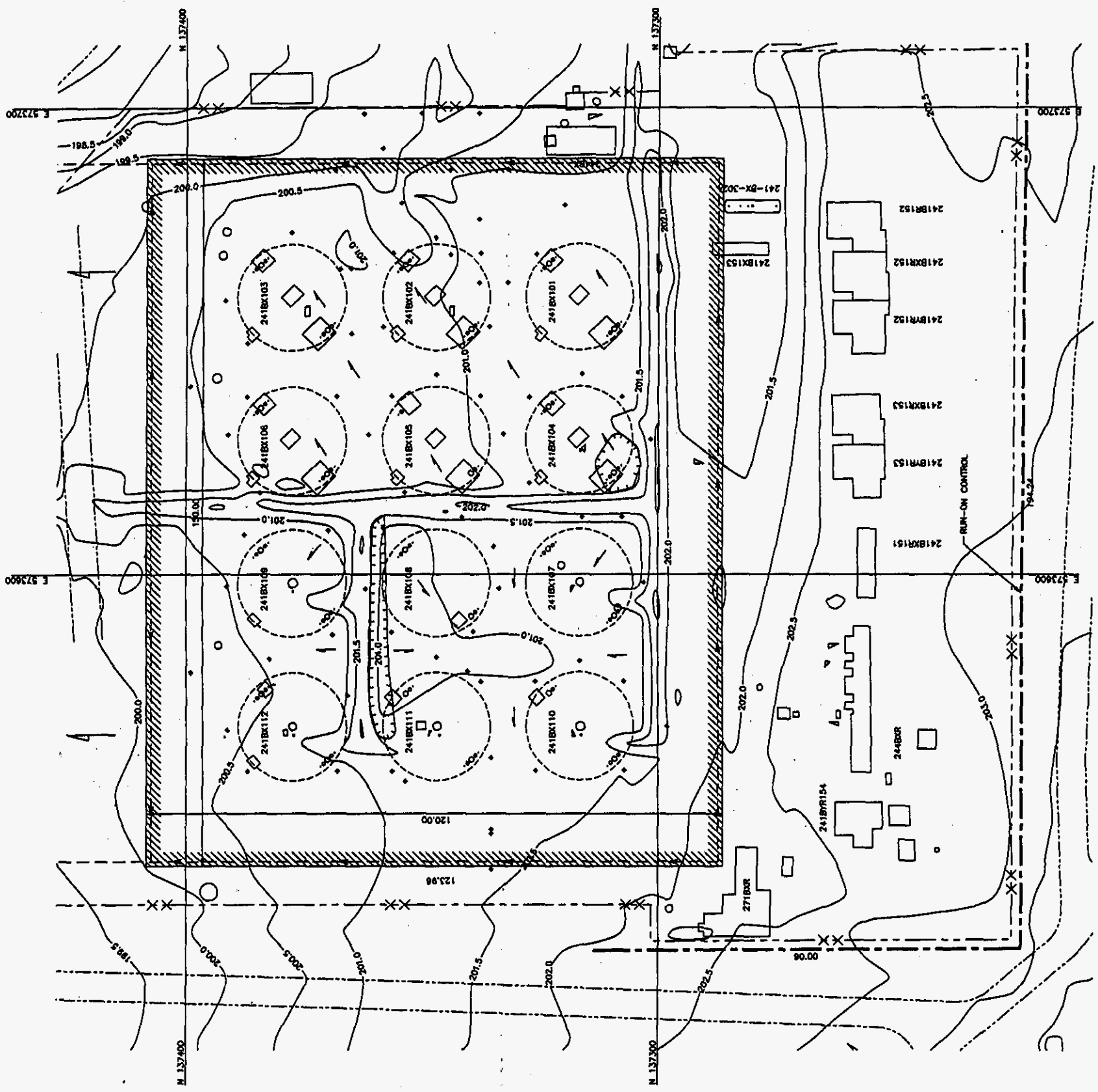
DWG NO.	TITLE	REFERENCES	DATE USED ON

U.S. DEPARTMENT OF ENERGY
 Civil/Environmental
 SURFACE WATER CONTROL
 241-BX TANK FARM

NO.	DATE	BY	REVISIONS

LEGEND -- PROPOSED:

-  SURFACE WATER CONTROL AREA
-  SURFACE DRAINAGE DIRECTION
-  SURFACE WATER COLLECTION AREA
-  BERM
-  DRAINAGE DITCH
-  ASPHALT CURB
-  DRAIN TILE
-  CATCH BASIN AND CULVERT

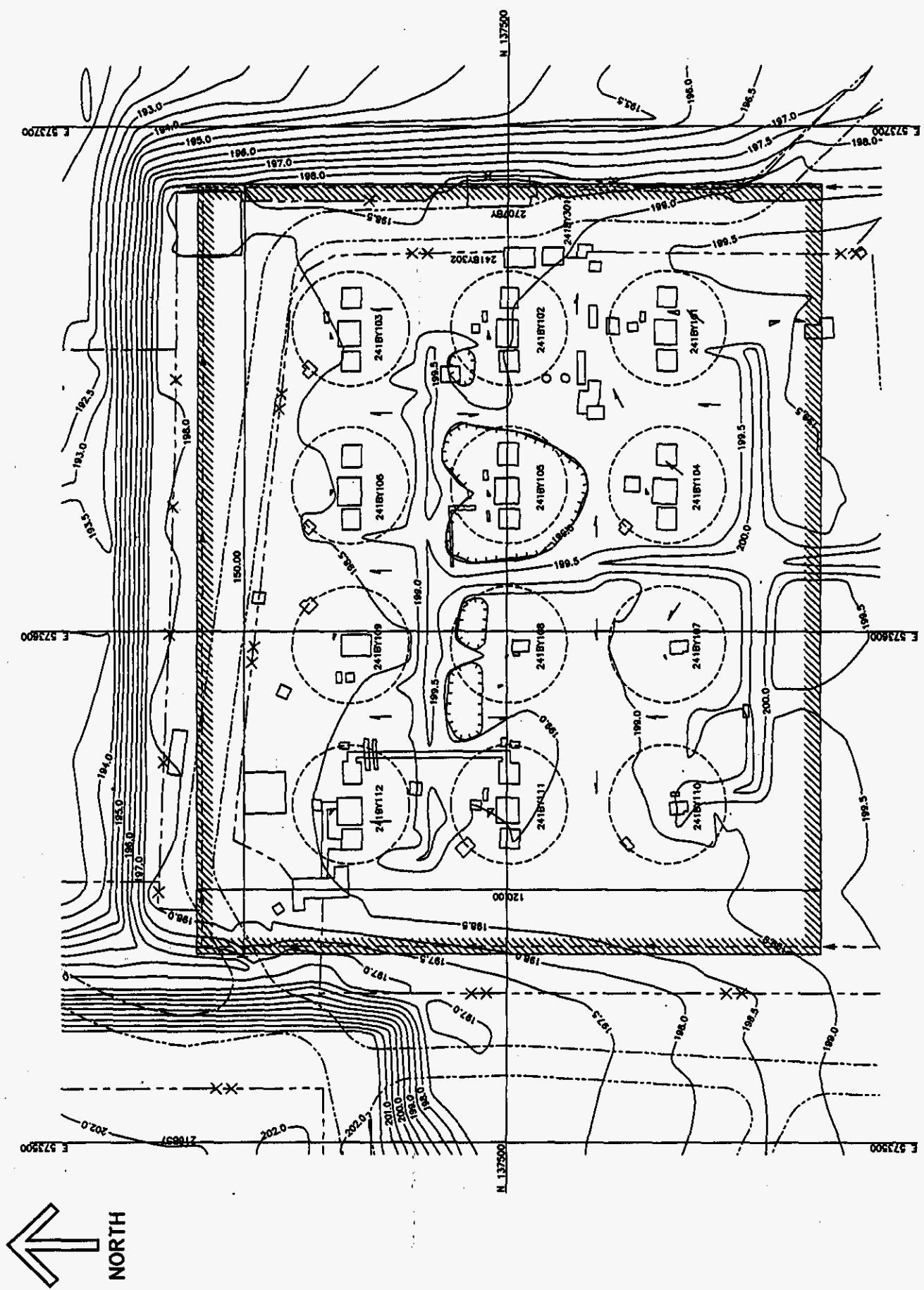


241-BX TANK FARM

DWG NO	TITLE	DATE	BY	CHKD	APP'D

REF NUMBER	TITLE	DATE	BY	CHKD	APP'D

DWG NO	TITLE	DATE	BY	CHKD	APP'D



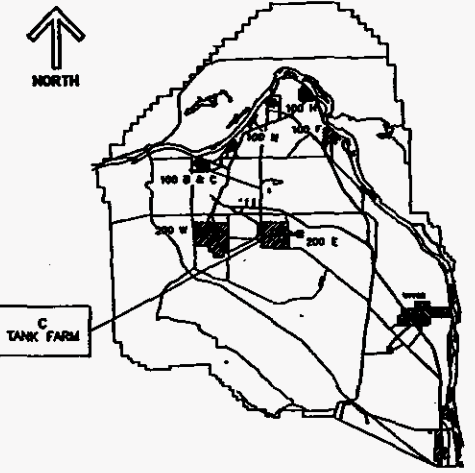
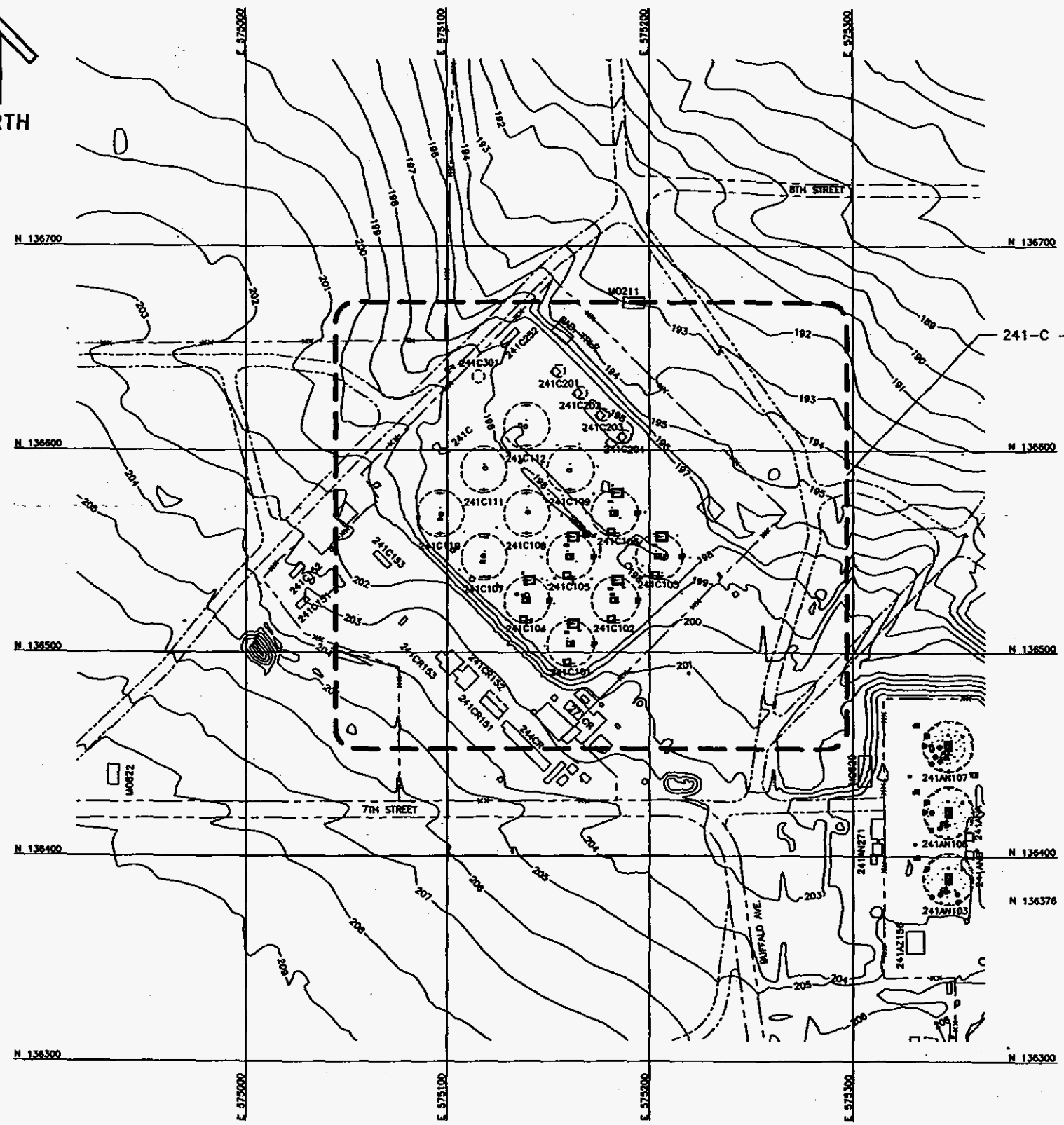
LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- BEEM
- DRAINAGE DITCH
- ASPHALT CURB
- DRAIN TILE
- CATCH BASIN AND CULVERT
- ES-050051-C1 SH 19
- ES-050051-C1 SH 19
- ES-050051-C1 SH 19
- ES-050051-C1 SH 19
- ES-050051-C1 SH 19
- ES-050051-C1 SH 19

241-BY TANK FARM

U.S. DEPARTMENT OF ENERGY	
Civil/Environmental	
Surface Water Control	
241-BY TANK FARM	
DATE	1988
BY	J. W. H. S. H.
NO.	ES-050051-C1
REV.	0

DWG NO	DATE	TITLE	BY	CHKD	APP'D



HANFORD RESERVATION

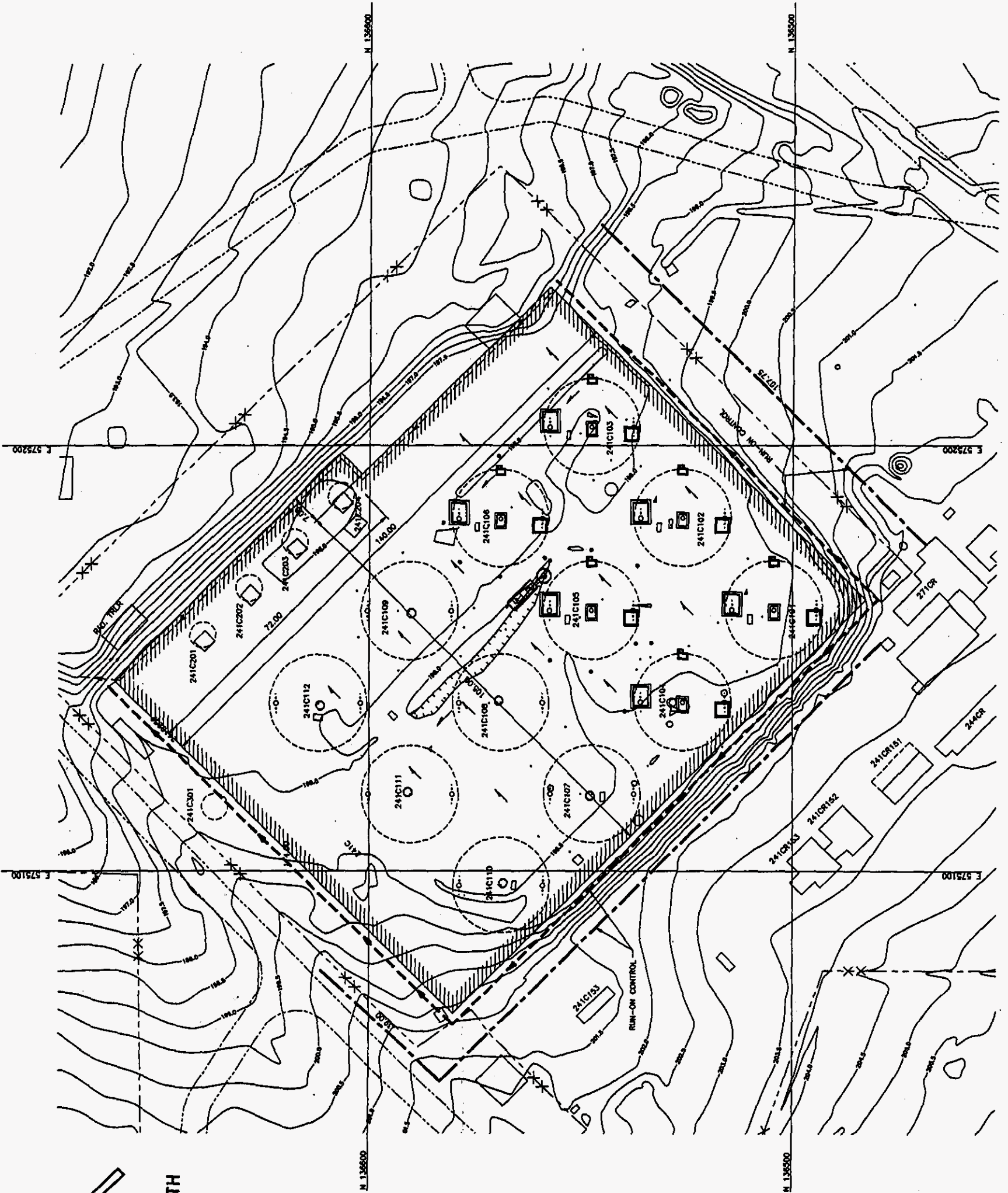
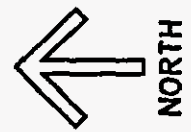
LEGEND - EXISTING:

- UNDERGROUND WASTE TANK
- EXISTING GROUND CONTOUR (NAVD88 METERS)
- SURFACE DRAINAGE DIRECTION
- GRID LINE (WCS83S91 METERS)
- BUILDING/MISC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- FENCE

C FARM COMPLEX

NAME		DATE		U.S. DEPARTMENT OF ENERGY	
J. J. WATKINS				National Operations Office	
CIVIL/ENVIRONMENTAL				SURFACE WATER CONTROL	
C FARM COMPLEX				ES-050051-C1 0	
DATE	BY	DATE	BY	DATE	BY
F	200C	0100			

DWG NO	TITLE	REF NUMBER	TITLE	DATE	BY
	DRAWING TRACEABILITY LIST		REFERENCES		



LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- BERM
- DRAINAGE DITCH
- ASPHALT CURB
- DRAIN TILE
- CATCH BASIN AND CULVERT

241-C TANK FARM

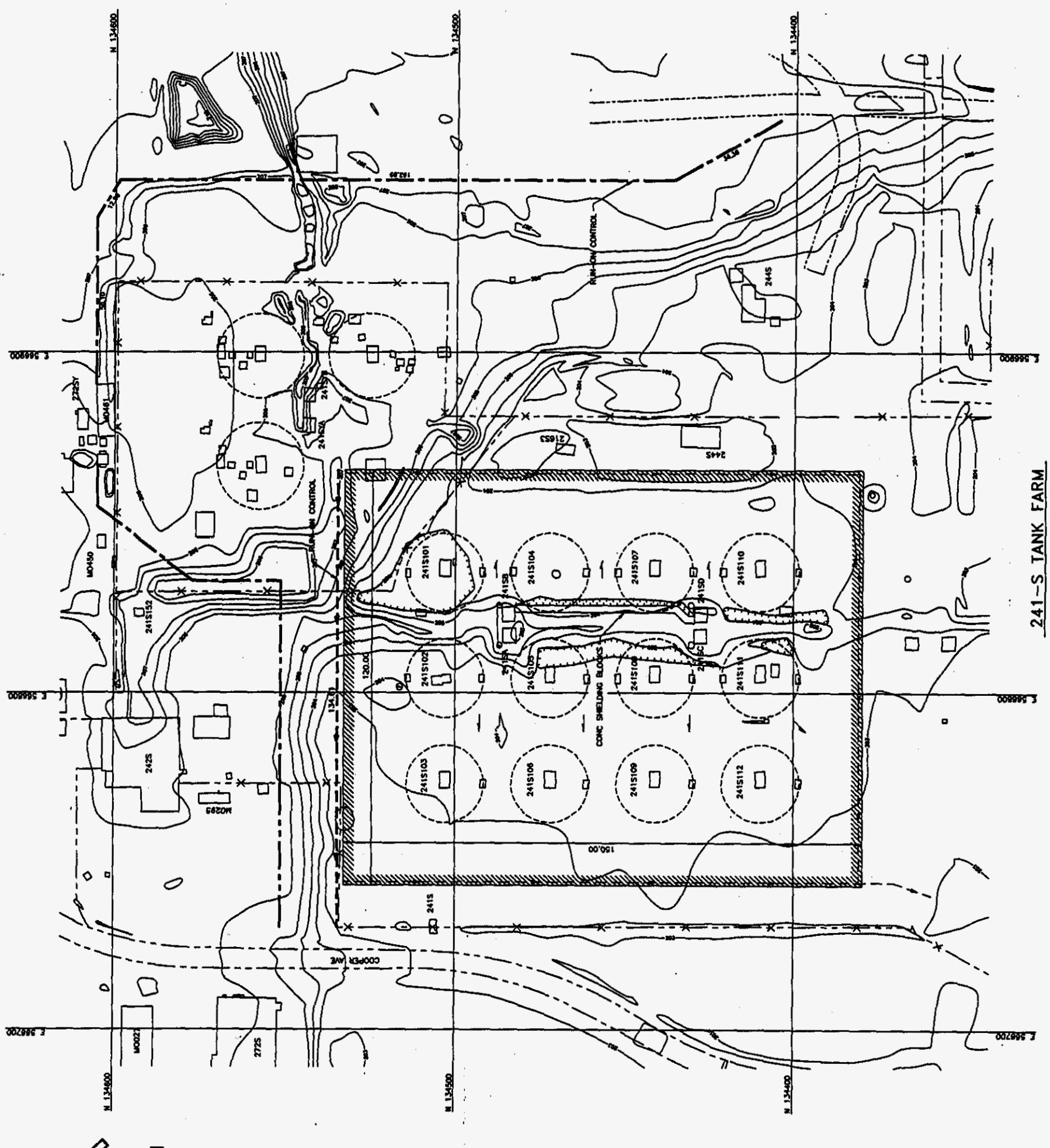
U.S. DEPARTMENT OF ENERGY	
Civil/Environmental	
SURFACE WATER CONTROL	
241-C TANK FARM	
DATE	1:500
SCALE	ES-050051-C1

NO.	DATE	BY	DESCRIPTION

DWG NO.	TITLE	DATE	BY	CHKD	APP'D

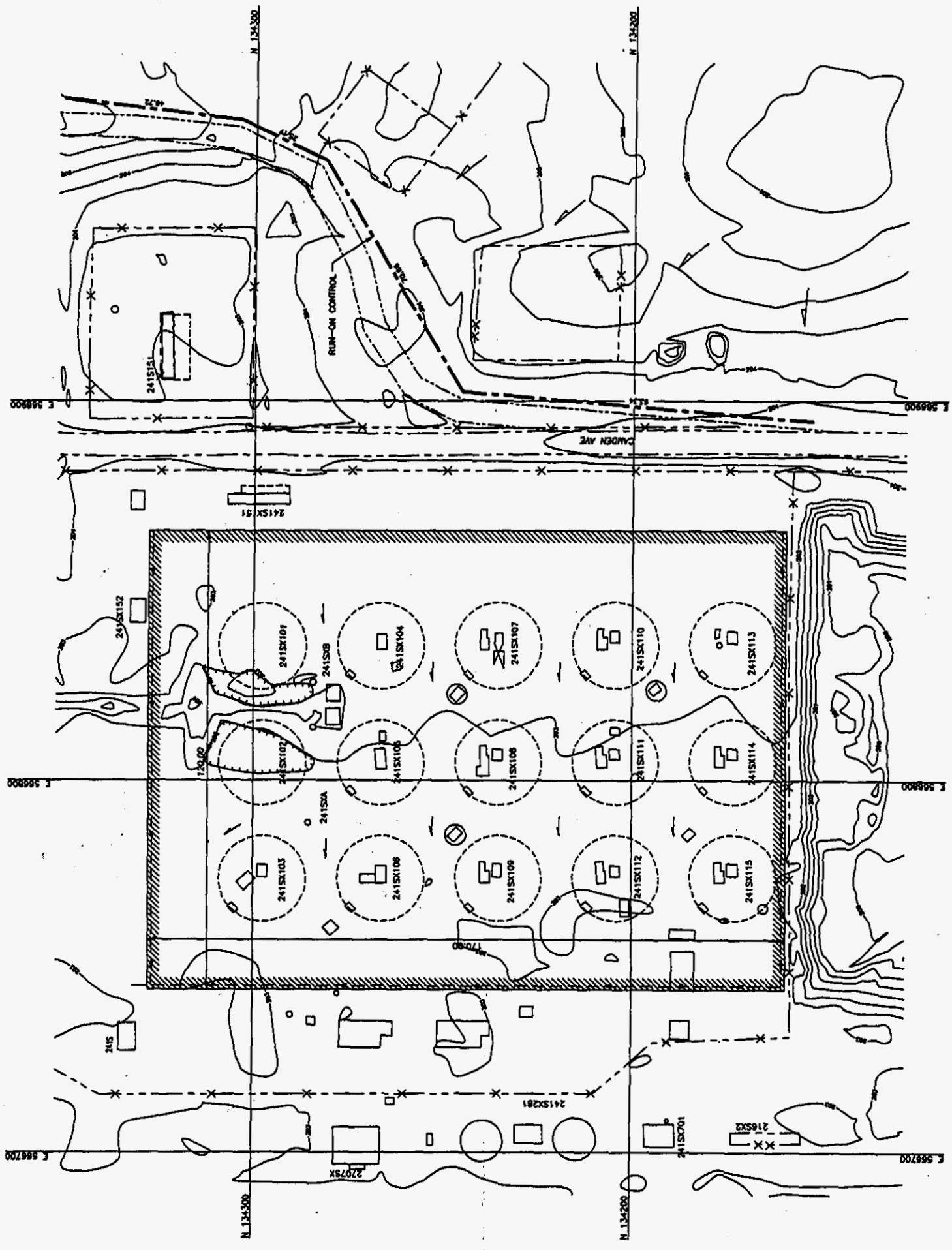
LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- BERM
- DRAINAGE DITCH
- ASPHALT CURB
- DRAIN TILE
- CATCH BASIN AND CULVERT



241-S TANK FARM

REF. NO.	DRAWING TRACEABILITY LIST	TITLE	DATE	BY	CHKD.	REV.



241-SX TANK FARM

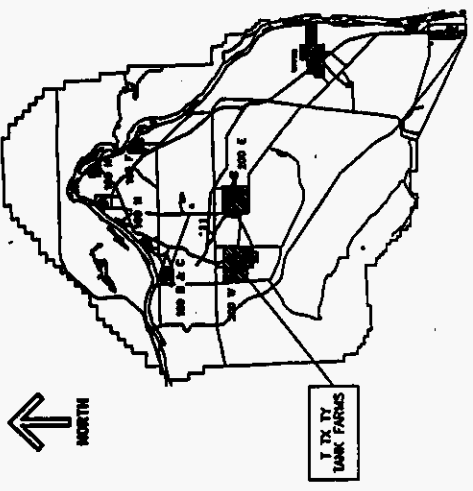
LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- BOTTOM
- DRAINAGE DITCH
- ASPHALT CURB
- DRAIN TILE
- CATCH BASIN AND CULVERT

U.S. DEPARTMENT OF ENERGY	
Civil/Environmental	
SURFACE WATER CONTROL	
241-SX TANK FARM	
DATE	12/10/00
SCALE	AS SHOWN
PROJECT NO.	ES-050051-C1
REV.	0

REV.	DATE	BY	CHKD.	TITLE

DWG NO.	TITLE	DATE	BY	CHKD.



HANFORD RESERVATION

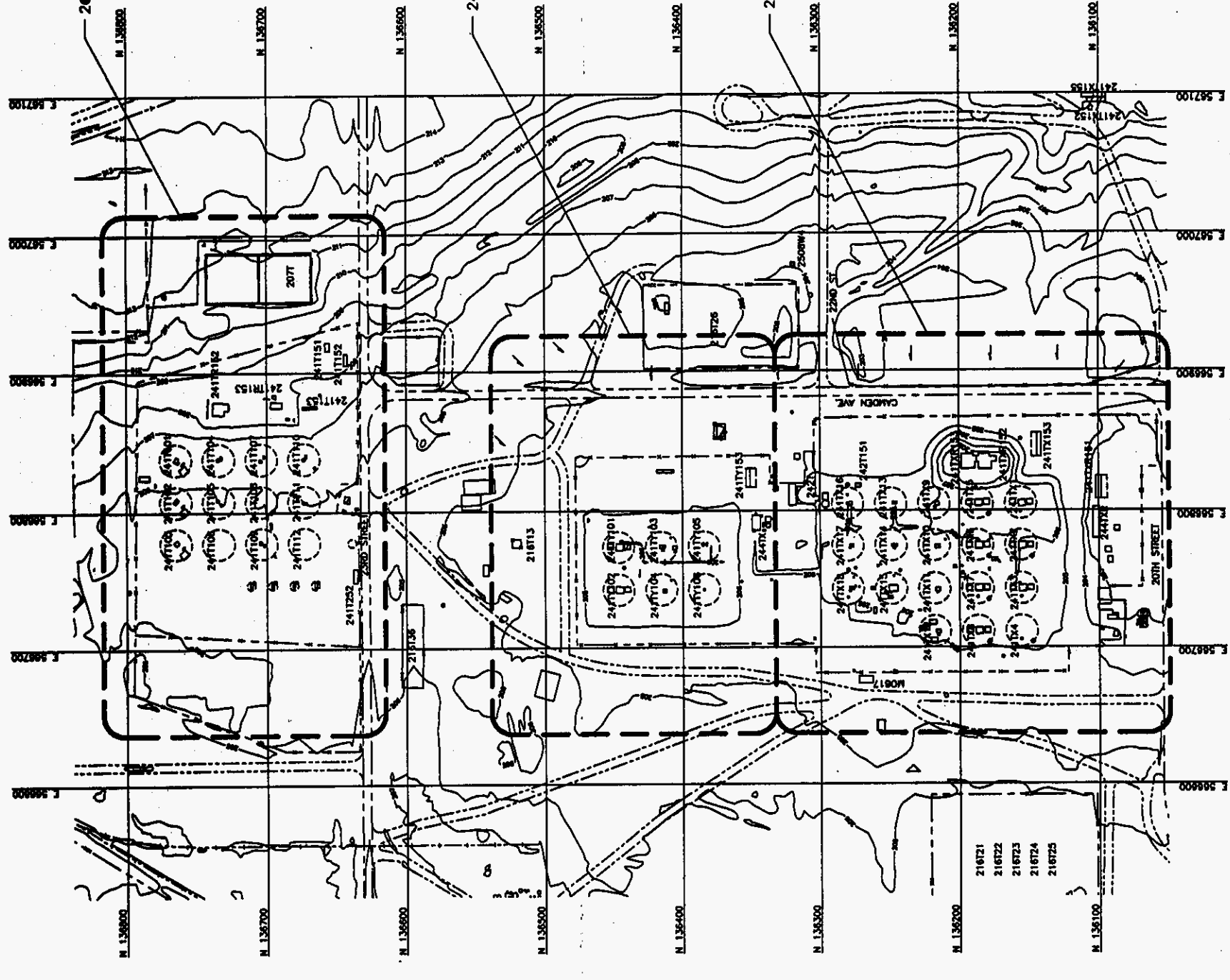
LEGEND - EXISTING:

- UNDERGROUND WASTE TANK
- EXISTING GROUND CONTOUR (NUMBERS METERS)
- SURFACE DRAINAGE DIRECTION
- GRID LINE (NCSLSS91 METERS)
- BUILDING/MSC STRUCTURE
- PAVED ROAD
- GRAVEL/DIRT ROAD
- RAILROAD
- FENCE

201-T - SEE ES-050051-C1 SH 14

241-TY - SEE ES-050051-C1 SH 16

241-TX - SEE ES-050051-C1 SH 15

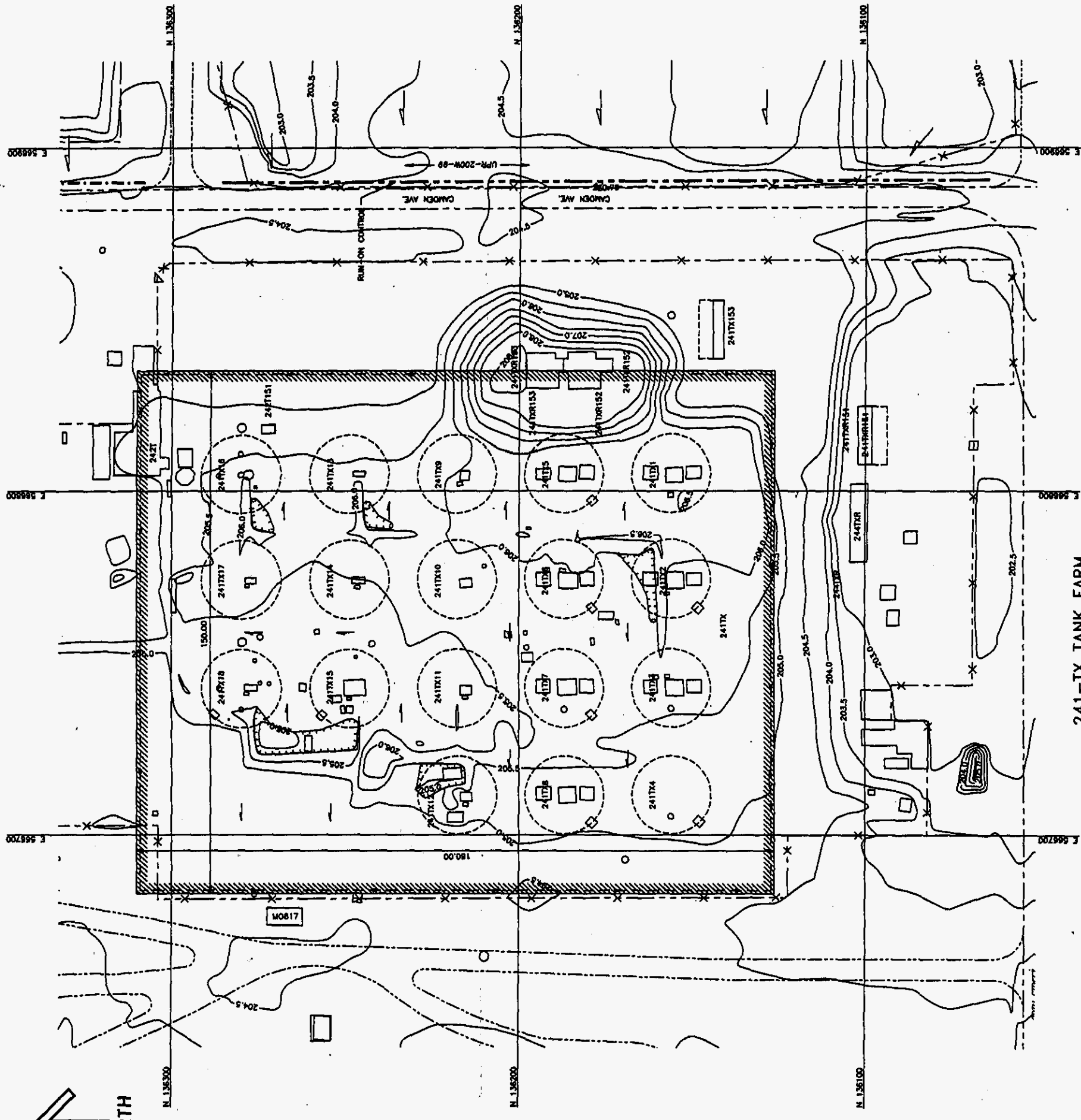
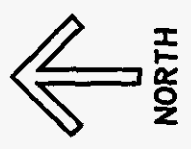


I FARM COMPLEX









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BY: [blank]	DATE: [blank]	SCALE: 1:1500	PROJECT: [blank]
U.S. DEPARTMENT OF ENERGY Civil/Environmental Surface Water Control I FARM COMPLEX			
ES-050051-C1.0			

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REF NUMBER	TITLE	DATE	BY	CHKD	APP'D	REV	DESCRIPTION
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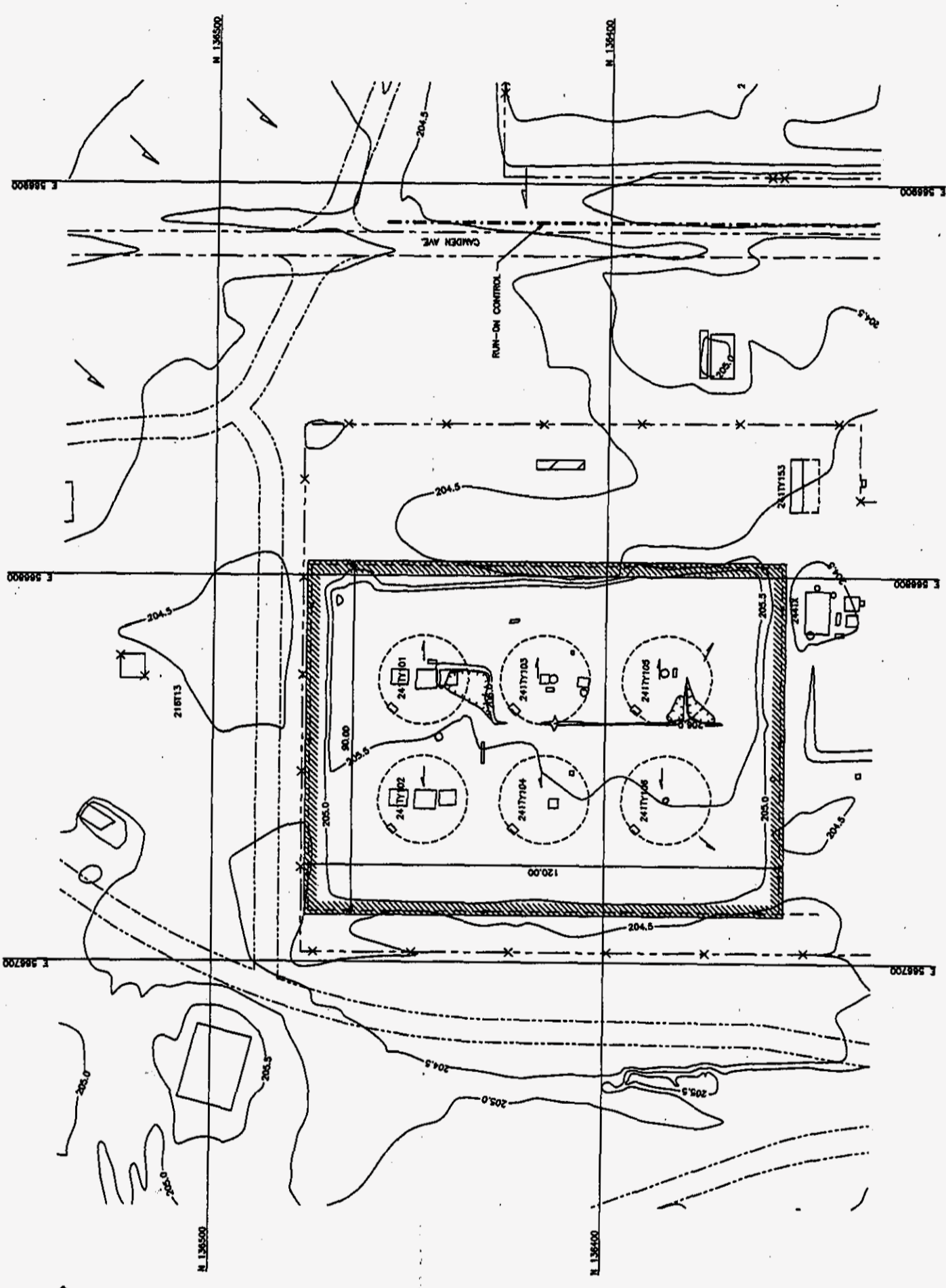
-  SURFACE WATER CONTROL AREA
-  SURFACE DRAINAGE DIRECTION
-  SURFACE WATER COLLECTION AREA
-  BETH
-  DRAINAGE DITCH
-  ASPHALT CURB
-  DRAIN TILE
-  CATCH BASIN AND CULVERT

241-TX TANK FARM

U.S. DEPARTMENT OF ENERGY
 CIVIL/ENVIRONMENTAL
 SURFACE WATER CONTROL
 241-TX TANK FARM

NAME	
DATE	
SCALE	
PROJECT NO.	ES-050051-C1
DATE	1980

REV. NO.	DATE	DESCRIPTION	BY	CHKD.



241-TY TANK FARM

LEGEND - PROPOSED:

- SURFACE WATER CONTROL AREA
- SURFACE DRAINAGE DIRECTION
- SURFACE WATER COLLECTION AREA
- BERM
- DRAINAGE DITCH
- ASPHALT CURB
- DRAIN TILE
- CATCH BASIN AND CULVERT

U.S. DEPARTMENT OF ENERGY
 Civil/Environmental
 SURFACE WATER CONTROL
 241-TY TANK FARM

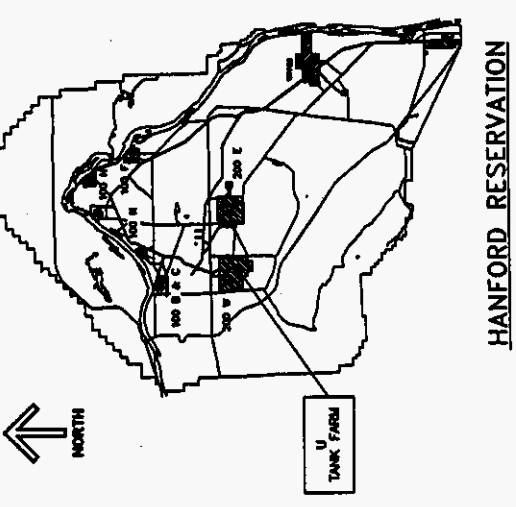
NAME	DATE	REVISIONS
J.W. McFISH		

ES-050051-C1

REV. NO.	TITLE	DATE	BY	CHKD.	APP.

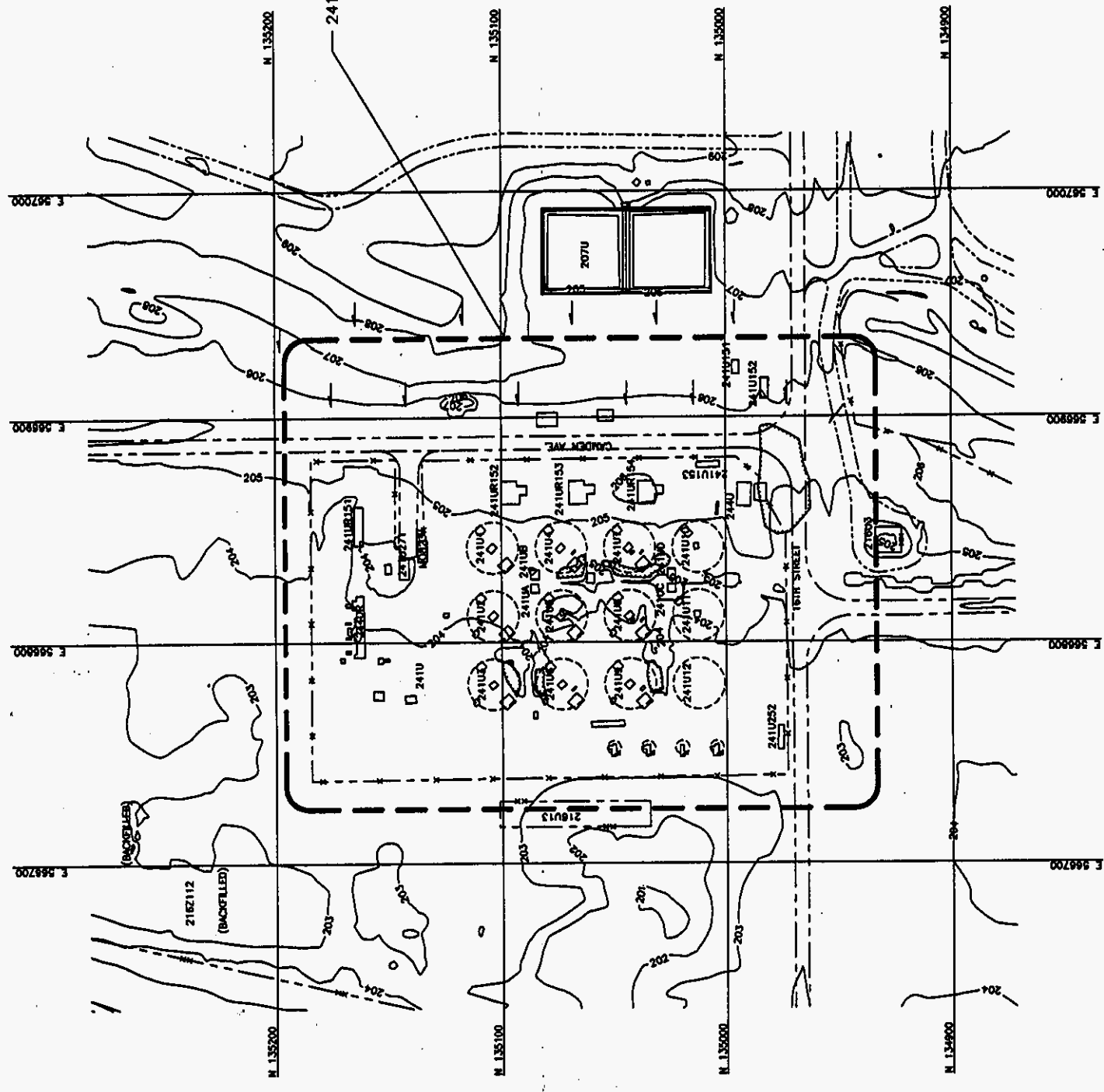
REVISED BY: _____

DATE: _____



- LEGEND - EXISTING:**
- UNDERGROUND WASTE TANK
 - EXISTING GROUND CONTOUR (NAVDSS METERS)
 - SURFACE DRAINAGE DIRECTION
 - GRID LINE (NCS83/81 METERS)
 - BUILDING/MISC STRUCTURE
 - PAVED ROAD
 - GRAVEL/DIRT ROAD
 - RAILROAD
 - FENCE

241-U - SEE ES-050051-C1 SH 18











NO.	DATE	BY	DESCRIPTION
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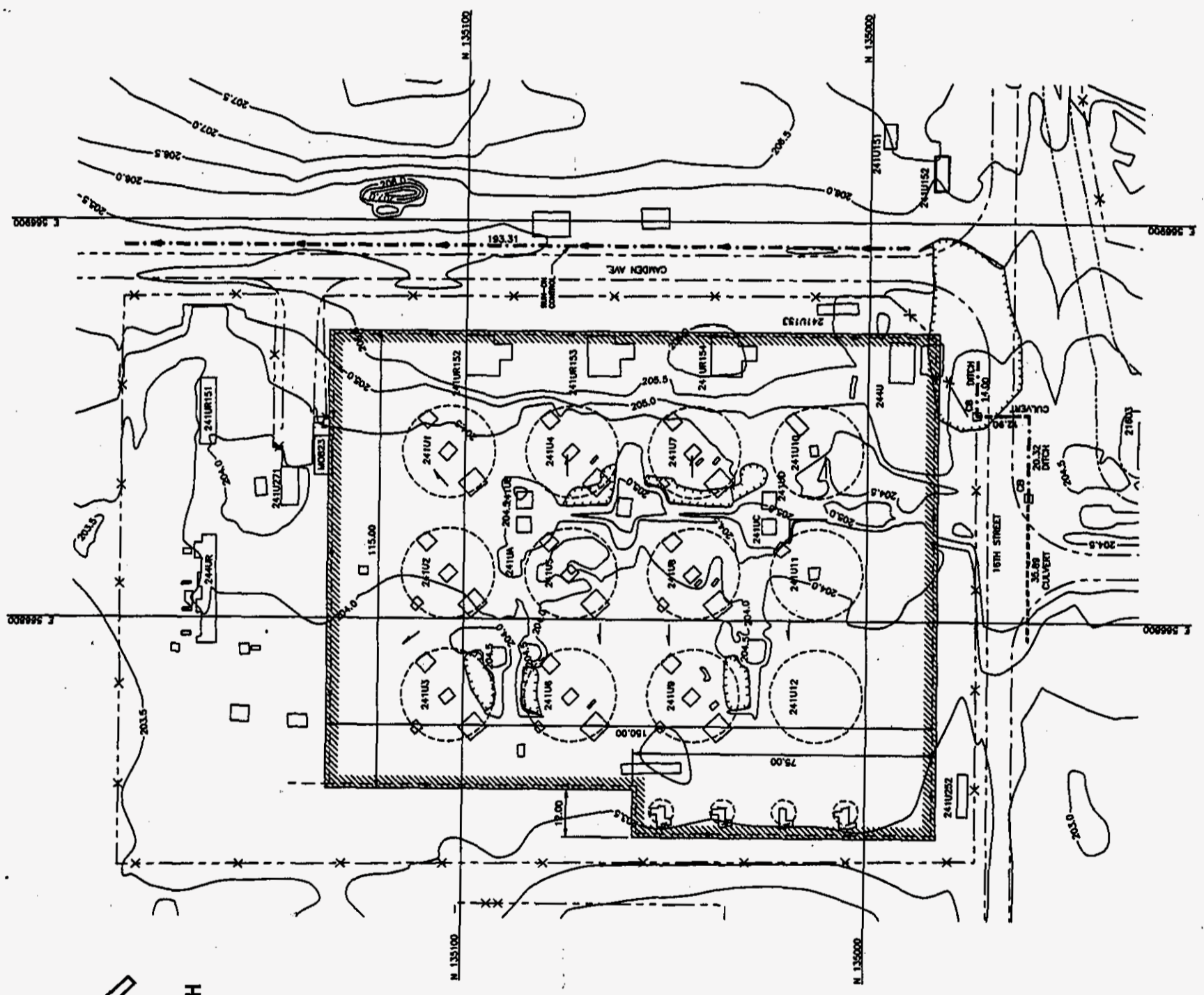
U.S. DEPARTMENT OF ENERGY
 CIVIL/ENVIRONMENTAL
 SURFACE WATER CONTROL
 241-U TANK FARM

NAME	DATE	BY	NO.	REV.	DESCRIPTION

ES-050051-C1 SH 19

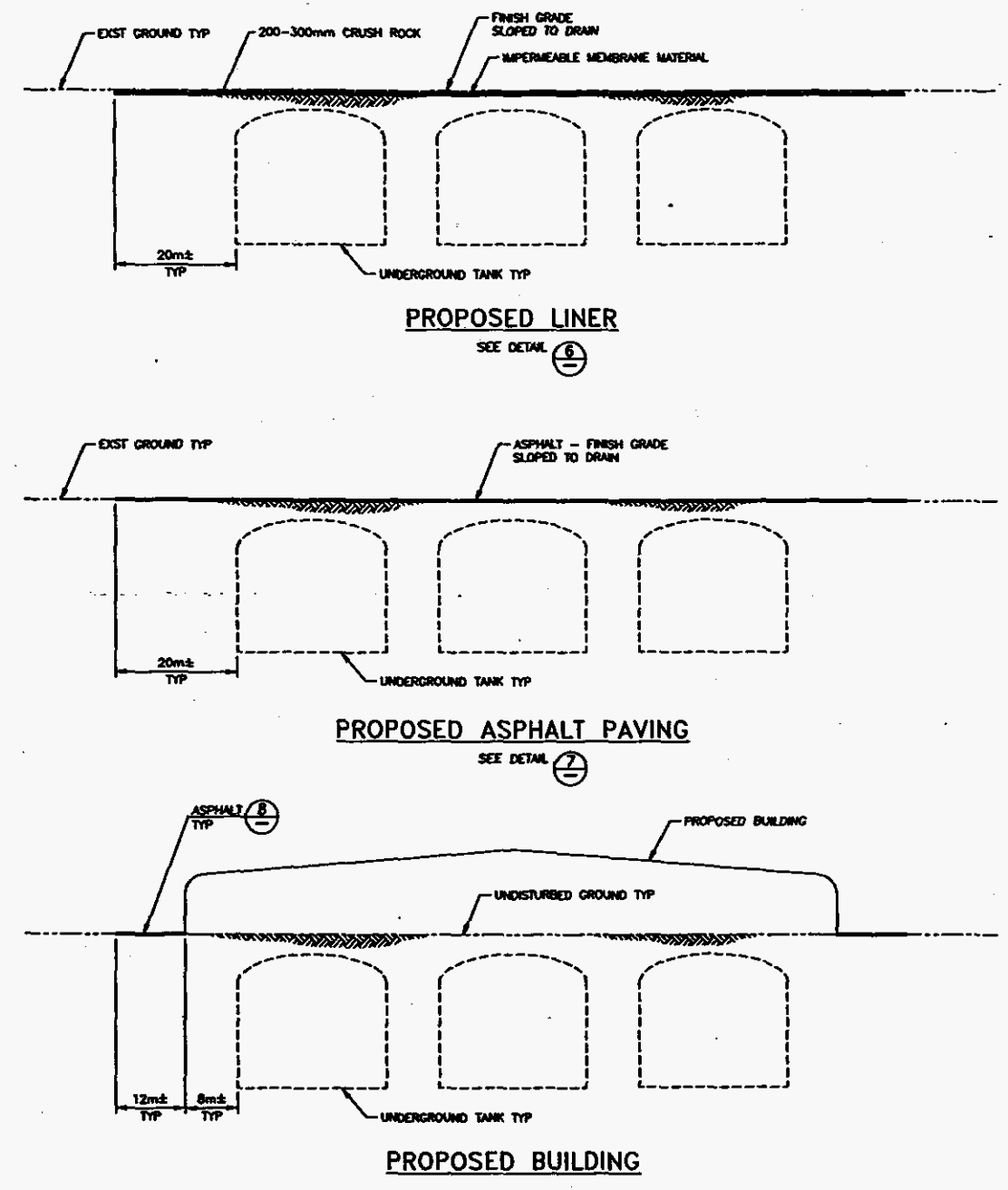
LEGEND -- PROPOSED:

-  SURFACE WATER CONTROL AREA
-  SURFACE DRAINAGE DIRECTION
-  SURFACE WATER COLLECTION AREA
-  BERM
-  DRAINAGE DITCH
-  ASPHALT CURB
-  DRAIN TILE
-  CATCH BASIN AND CULVERT

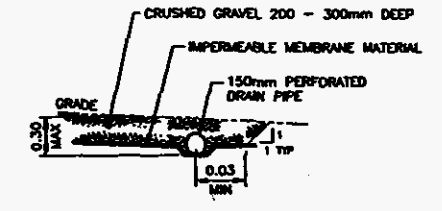
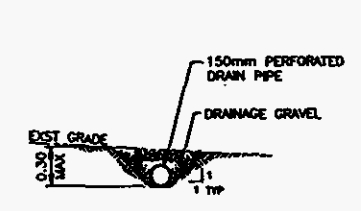
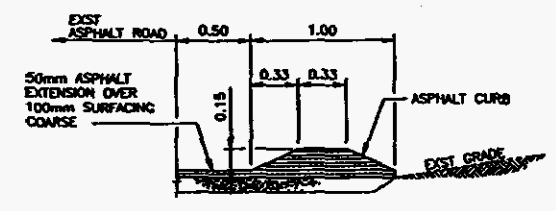
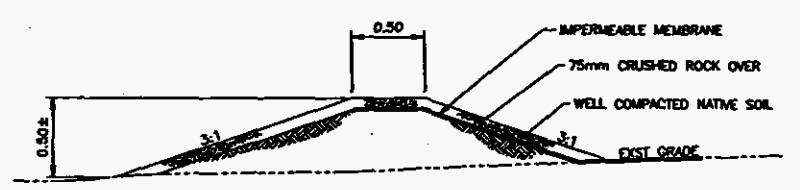


241-U TANK FARM

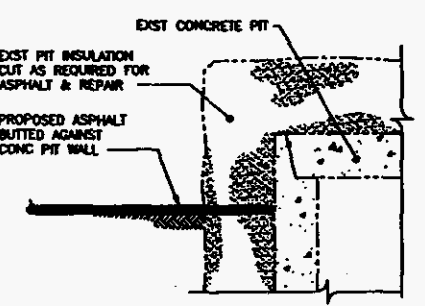
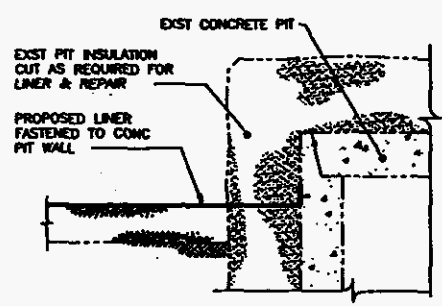
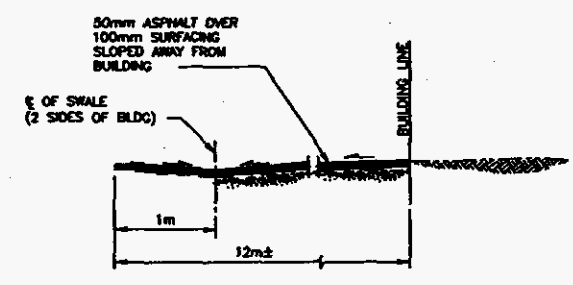
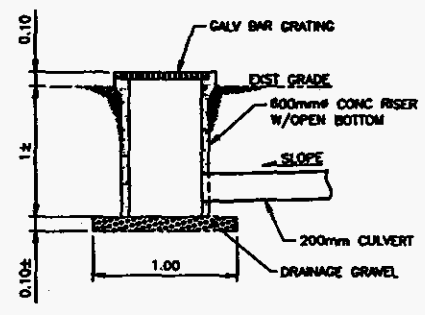
DATE	TITLE	BY	NO.	REV.	DESCRIPTION



A SURFACE WATER CONTROL - SECTION
ES-050051-C1 SH 2 NO SCALE
SH 3
SH 4
SH 5
SH 6
SH 7
SH 8
SH 9
SH 10
SH 11
SH 12
SH 13
SH 14
SH 15
SH 16
SH 17
SH 18



3 ASPHALT CURB
ES-050051-C1 SH 3 NO SCALE
SH 15



DWG NO	TITLE	REF NUMBER	TITLE	REV	DATE	BY	CHECKED

U.S. DEPARTMENT OF ENERGY
Nuclear Operations Office

CIVIL/ENVIRONMENTAL SURFACE WATER CONTROL DRAINAGE DETAILS

ES-050051-C1

Page III-D-19h