Department of Energy

Ohio Field Office
Fernald Closure Project
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JAN 1 1 2005

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SR-6J
77 W. Jackson Blvd.
Chicago, IL 60604-3590

DOE-0115-05

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 E. 5th Street
Dayton, OH 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSPORTATION AND DISPOSAL PLAN FOR OPERABLE UNIT 1

Reference: Transportation and Disposal Plan for Operable Unit 1, Fernald, Ohio, Department of Energy, July 1998

Based on the current final stage of the Fernald clean up mission, there is a need to modify the Transportation Plan in Reference 1. The proposed changes are in Enclosure 1 for your review.

These changes are being made to allow shipment of Above OSDF Waste Acceptance Criteria (AWAC) materials that meets current DOT transportation LSA-I requirements by using additional rail cars with a sealed DOT IP-1 waste package system for containment without lids on the rail cars. The use of these additional rail cars and new IP-1 containers would allow the outdoor loading, packaging, shipping, and off-site disposal of stockpiled AWAC materials to occur in parallel with the off-site shipment and disposal of remaining pit wastes.

The average concentrations of uranium (390 pCi/g) and thorium 230 (10 pCi/g) in the AWAC materials are only fractions of the average Waste Pit wastes concentrations of uranium (2467 pCi/g) and thorium 230 (1766 pCi/g) already sent. For the relatively low radioactivities of AWAC materials, this DOT approved IP-1 packaging system would provide an overall equal or greater safety margin against potential radiological exposures during transportation compared to the combination of the existing packaging system and the Waste Pit materials.

This approach will allow for completion of the safe shipping and off-site disposal of all remaining AWAC materials during fiscal year 2005. This type of liner/gondola system is being used throughout the country and in the State of Ohio for the transportation of low activity radioactive wastes similar to the remaining AWAC materials at Fernald that need to be transported off site. DOE, the Corps of Engineers, and commercial demolition and decommissioning companies at nuclear power plants have made more than 18,000 shipments using these IP-1 packages. Additional information can be found in the attached Fact Sheet.

Also attached for your review is the "SP7 Implementation Plan". This Plan provides information on the load out configuration and process that will be used to load materials from AWAC materials stockpile areas into rail cars and the new IP-1 packaging system for shipment off-site.

DOE still plans to submit to a plan for removing, cleaning, and disposing of debris from SP7 in the OSDF for your review and approval. This Plan will be submitted in January 2005.

If you have any questions regarding this strategy please call Johnny Reising at 513-648-3139.

Sincerely,

WJTaylor
William J. Taylor
Director

FCP:Reising

Enclosure: As Stated

cc w/enclosure:
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ATTACHMENT 1
PROPOSED CHANGES TO "TRANSPORTATION AND DISPOSAL PLAN FOR OPERABLE UNIT 1"

Section 2.5.1, (DOT Requirements) changes:

Current Language:

"Packaging of this type of waste requires a strong, tight package for shipment (49 CFR 173.427). By definition, a strong, tight package prevents leakage of radioactive contents under normal transportation conditions. The Femp Gondola railcars will be designed to meet this requirement and will have an additional liner permanently applied to further reduce the chance of leakage."

Changes:

This section is changed to eliminate the "and will have an additional liner permanently applied to further reduce the chance of leakage".

Section 2.5.2, (Railroad Requirements) changes:

Current Language:

"During repairs, the car lids will not be removed nor will the contents be unloaded without the presence of a DOE representative."

Changes:

This section is changed to "During repairs, the contents will not be unloaded without the presence of a DOE representative."

Section 3.2.2, (Location #2: Railcar Loadout and Scale Facility) changes:

Current language:

"At this facility the railcar covers will be removed, liners installed, cars loaded, liners sealed, and railcar covers replaced."

Changes:

This sentence is changed to read: "At this facility the railcar liners will be installed, cars loaded, and liners sealed."

The title of Section 3.2.2 will be changed to Location #2: Railcar Loadout Facilities

Another paragraph will be added to Section 3.2.2 stating:

"A second temporary load out facility will be constructed that will provide additional load out capacity for Above Waste Acceptance Criteria (AWAC) soil and debris. The layout and operational approach of this facility will be presented to U.S. EPA and Ohio EPA for their concurrences. In general at this facility, liners will be installed, AWAC and other materials will be loaded, the liners sealed, and other activities will be performed to prepare the railcars for shipment as well as to control impacted runoff and dust."

Section 3.6, (Runoff/Drainage Control) changes:

Current Language:

"The FEMP railcars will be designed to include a permanent, impermeable polyurethane liner which will ensure the tightness of the gondola car against leaks. This polyurethane liner will be applied to the inside surface of the gondolas. Each gondola car will also have a rigid cover that will remain in place except for loading and unloading. In addition to the permanent railcar liner, a disposable liner will be installed prior to loading each car. This liner will aid in removing waste from the car at the disposal facility by minimizing hold-up material and contamination."

Changes:

This section is revised to add the following paragraph:

"For transport of AWAC soil and debris meeting current LSA-1 requirements, gondola cars meeting DOT IP-1 packaging requirements may be used."

FACT SHEET
GONDOLA REQUIREMENTS FOR SHIPMENT OF AWAC SOILS, DEBRIS TO ENVIROCARE
DECEMBER 21, 2004

How is this material (AWAC soils and debris) different from the waste pit waste already sent off site?

This material contains only a fraction of the radionuclides contained in waste already shipped off-site.

The average uranium concentration measured in SP7 (Stock Pile 7 – AWAC soil and debris.) is less than 16 percent (or one sixth) of the uranium concentration in the waste pit material already shipped; the maximum uranium concentration in SP7 is less than 10 percent (one tenth) of the maximum uranium concentration shipped. The average thorium 230 concentration measured in SP7 is less than 0.5 percent (or one two-hundredth) of the thorium 230 concentration already shipped off-site; the maximum is less than 2.6 percent (or one thirty-eighth) of the maximum concentration of material shipped off-site.

The concentrations of radionuclides in the AWAC soils and debris in SP7 are much lower than pit waste already sent to Envirocare. The average measured uranium concentration in SP7 is 390 pCi/g; the maximum is 2561 pCi/g. The average thorium 230 concentration is 10 pCi/g; the maximum is 161 pCi/g.

The pit waste already shipped off-site averaged 2467 pCi/g for uranium and 1766 pCi/g for thorium 230. The maximums were 27,988 pCi/g for uranium and 6,384 pCi/g for thorium 230.

What are the requirements for transportation of this AWAC soil, debris?

By DOT definition (49CFR173.403), this material is LSA-I material and requires containment and shipment in an IP-1 package. A soft-sided IP-1 containment package inside a gondola car will meet these requirements. The IP-1 package contains the waste during shipment and does not require a specific hard lid. An IP-1 package itself must contain the material and be a barrier preventing any material release.

After the OU1 ROD was issued, the DOT requirements were modified to reduce the concentration of radionulides defined as LSA-I material. The cut off for LSA-I is now 810 pCi/g for thorium 230 (At the time of signing the OU1 ROD this limit was over 5,410 pCi/g.). All of the material shipped in IP-1 packages will be well under these limits. For example, the average uranium concentration measured in SP7 is 390 pCi/g compared to the limit of 8,100 pCi/g; thorium is 10 pCi/g compared to 810 pCi/g. The AWAC soils, debris, and subsurface and liner material would have to meet this more restrictive standard to be shipped in an IP-1 package.

Are other facilities using this type of IP-1 package?

Yes. The Corps of Engineers, DOE, and nuclear power industry have shipped more than 18,000 railcars to commercial disposal facilities with this type of package system without any incidents.

Will this change reduce the level of protection to the public?

No. The use of this type of IP-1 package will provide the same level of public health and environmental protection as the current packaging. The level of protection will actually be increased because of the lower activity of the material being shipped.

The calculated risk (From OU1 ROD) of 1.2×10^{-10} (or 12 in 1 billion) excess cancer risk to members of the general public for accident-free waste transportation will be met. The calculated excess cancer risk to members of the general public for the accident scenario of 4.6×10^{-5} (or 46 in 100,0000) will also be met. In fact, the actual risks based on the lower concentration of radionuclides will be lower than these calculated risks.

Any precipitation that falls on the gondola will not come in contact with the materials in the liner and will be allowed to safely drain from the car to prevent water building up inside the gondola. The integrity of the liner will be maintained during filling.

All railcars returning to the site without gondola covers will have been decontaminated to meet DOT requirements for return to any service.

Why is this change necessary?

The quantity of excavated AWAC soil, debris, and pit material below the top of clay liner has grown substantially this fiscal year, Pit material by 72,000 tons and AWAC by 20,000 tons. Additional increases could also occur. Over the life of the project AWAC soil has grown from 45,000 tons to 284,000 tons.

Because AWAC soil and debris is LSA-I, it can be shipped in a more cost effective package without reducing the margin of safety compared to the higher concentration material already sent.

What were the ROD requirements?

The ROD only specified that the transportation needed to meet DOT requirements. The Transportation and Disposal Plan indicated that there would be a permanent liner (assists in containment), a temporary liner (for ease of handling at Envirocare), and a lid on the gondola. The lid and the gondola were considered the package compared to the proposed system of a soft-sided IP-1 containment package inside a gondola. The plan will have to be modified and approved by US EPA and Ohio EPA. The revision would only allow LSA-I material to be shipped in the IP-1 package described.

SP-7 Implementation Plan

1.0 Introduction

In June 2004, an Implementation Plan for Waste Pit decontamination and demolition was submitted to the agencies (#15000-PL-0001). The comments/response from DOE required a separate plan submittal to the agency for review and approval to complete loadout of remaining above waste acceptance criteria (AWAC) materials located inside the SP-7 Stockpile. These AWAC materials are planned to be loaded outside of the Waste Pits Project (WPP) Rail Loadout Building (RLB). The SP-7 Stockpile is configured into two sections within the controlled boundary. The SP-7 Stockpile consists of materials from soil excavations throughout the former production area, the abandoned outfall line, filter cake residue from the Advanced Wastewater Treatment (AWWT) Facility, demolition debris, and various waste materials from other remedial activities characterized as being above the On-Site Disposal Facility (OSDF) WAC.

The infrastructure to remove and load SP-7 Stockpile materials into rail cars consists of:

Trailer complex areas for controlled entry and worker cool down
300' by 30' rail car loading area
Platform for Installation/Closure of IP-1 package
Available water for dust control
Trenching for water management
Fencing/berms for boundary and runoff control

This document addresses redesign investigation, removal action approach, water management, fugitive emissions and reference drawings depicting the operation loadout area.

2.0 SP-7 Stockpile Physical dimensions and characterization

2.1 Physical Description of SP-7 Stockpile

Soil Pile 7 lies in Area 6 just north of the Area 3B boundary in the northwest corner of the Former Production Area (FPA). Configured into two sections, east and west, the SP-7 Stockpile consists of materials from soil excavations throughout the former production area and the abandoned outfall line, as well as filter cake residue from the AWWT, demolition debris, and various waste materials from waste management activities. Prior to May 2004, the WPP project periodically excavated and hauled material out of SP-7 for eventual placement in bins at their RLB for sampling. The SP-7 material was sampled to verify Envirocare WAC compliance before load-out into railcars.

The west side of the stockpile was cordoned off and designated as inactive to facilitate in-situ sampling, which commenced May 2004. The east side of the stockpile remains active for material placement. The western section consists of approximately 47,000 cubic yards of material. The eastern section contains approximately 15,000 cubic yards. Both east and west sections include about 25% concrete debris by volume.

2.2 SP-7 Stockpile Material Characterization

The material in SP-7 is being characterized in-situ in three phases. The first phase of sampling and analysis was conducted on approximately 42,500 cubic yards of material in the west section May/June 2004. A second phase of sampling was conducted in late

November 2004 for 4500 cubic yards of material subsequently added to SP-7 prior to its segregation and the creation of an eastern section for all remaining material. The final phase of characterization is scheduled to be conducted on the eastern pile in January or February 2005 depending on completion of excavation in areas containing AWAC material (estimated to be an additional 5000 cu. yds.).

The analytical suite selected for SP-7 sampling was based on process knowledge, RI/FS sample data, and pre-design physical and real-time sampling results. The defined list of analytes included (12) radionuclides, (9) inorganic and (32) organic constituents, pH, and PCBs. Soil proctors were performed to measure the in-situ moisture and define the soils optimum moisture. The sample frequency used reflected the WPP waste bin sampling method, (approximately one sample per 400 cubic yards of material). To ensure representative sampling, boring locations were dispersed 3-dimesionally throughout the SP-7 stockpile. Based on the sample results, the SP-7 materials were characterized as LSA-I, class A waste The SP-7 sampling results to date are listed in Appendix B. Future sampling results will be submitted under a separate letter. No additional characterization will be done to support waste shipments, since the in-situ characterization will provide all of the data needed to support shipping and disposal decisions.

3. 0 SP-7 Stockpile Excavation Preparation

This section describes the technical approach for the removal and loadout of SP-7.

3.1 SITE PREPARATION

Site preparation activities associated with the removal of SP-7 include establishment of the site boundaries and controls, site layout and surface water management. The details are provided in the following text and the construction drawings referenced in Appendix A.

3.1.1 Site Boundaries and Controls

The perimeter of the work will be bounded by a combination of construction fence and use of existing perimeter fence. The road entrance and personnel entrances will utilize rope gates.

3.1.2 Surveying and Site Layout

The SP-7 work area will be surveyed to assure that the surface area is sloped to the storm water runoff ditches and the storm water runoff ditches drain to the Southeast corner of the SP-7 work area.

3.1.3 Surface Water Management

The area on the east side of the loadout tracks and contained within the perimeter fence is graded so the runoff is collected in a trench system that channels the surface water to an existing trench system in the Southeast corner of the SP-7 area. The surface water at this point is connected into a site drainage system that discharges the water into the storm water retention basin (SWRB). Reference drawing SK-LSA-I-01 in Appendix A for details.

The ditch area directly west and adjacent to the loadout tracks is a ditch and is considered a clean area. Contamination of this area is not anticipated to occur during the loadout process. However, as an added precaution 10' of Geotextile fabric will be laid next to

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tracks and staked to catch possible spill over during the loading operation. Further, the trench is dammed on both the North and South end of loadout area so that all surface water is contained. Any accumulation of water will be pumped into a trench on the east side. Reference drawing SK-LSA-I-02 in Appendix A for details.

3.1.4 Radiological Air Monitoring and Dust Control

Air Monitoring
Occupational monitoring will be performed using personal and workplace air samplers in the work areas to ensure worker protection and will also serve as an indication of the effectiveness of engineering controls

Dust Control
Water, commercially available dust suppression agents, or other appropriate methods and proactive work practices will be used to minimize dust generation during SP-7 removal/loading activities. In general, dust generation during soil excavation, handling, hauling, and loading will be controlled using work practices that include applying water (or other dust suppressant agents) to loadout area and temporary loadout piles. Water or other dust suppression agents will be applied in sufficient quantities to reasonably minimize dust generation, but limited so that they do not result in water migration beyond work area boundaries.

4.0 SP-7 Stockpile Excavation and Loadout Process

The process consists of excavating and loading the LSA-I material into an IP-2 rated rail car (current method) and/or a standard rail car lined with a soft-sided IP-1 packaging. The use of the IP-1 packaging is described in the Department of Transportation (DOT) regulations, 49CFR 173.427(b)(1). The following is a description of the steps in the loadout process.

4.2.1 Stockpile Excavation
Excavated SP-7 materials consist of soils and building debris (concrete with rebar and piping). Oversized debris will be re-worked to meet Envirocare's size criteria. Heavy earth moving equipment such as bull dozers will be used to move the SP-7 stockpiled material into load-out working piles adjacent to the loadout area and tracks. We will start with the excavation of the west section. Soil placement will continue in the east section, until such time that placement needs to stop in order to support sampling of the east section and prior to its excavation and loadout. Reference drawing SK-LSA-I-01 in Appendix A for details.

All SP-7 material will be excavated from both the western and eastern sections down to the underlying undisturbed soil elevation that existed prior to placement of SP-7 material.

4.2.2 Loadout Process
The IP-1 packaging will be installed in the railcar either at the SP-7 loadout area or in the existing Waste Pit Project's RLB. The area for installation of the IP-1 packaging in the SP-7 loadout area is shown on drawing SK-LSA-I-01 (Reference Appendix A).
The material will be loaded into the IP-2 rated rail cars or standard rail cars lined with a soft-sided IP-1 packaging using equipment such as front-end loader or track excavator. Material will be placed in both the IP-1 and IP-2 packagings in a manner that the debris

will not damage the packagings nor Envirocare's rail car roll-over facility. Reference drawing SK-LSA-I-02 in Appendix A for the loadout illustration.

The IP-1 packagings will be closed either at the SP-7 loadout area or in the existing Waste Pits RLB. The area for closing the IP-1 packaging in the SP-7 loadout area is shown on drawing SK-LSA-I-01 (Reference Appendix A).

4.2.3 Weighing the Railcar

Rail cars will be weighed in the RLB. The car is then assembled with other rail cars into a unit train for shipment to Envirocare.

3.2.4 Lid/De-lid Operation

The lidding/de-lidding of IP-2 rated rail cars will be performed in the RLB. If needed, a second lidding operation may be established on the roadway adjacent to the liner platform east of the loadout operation. Rail cars utilizing the IP-1 packaging do not require lids for the transport of LSA-I material. At the completion of the Waste Pit project, the FCP intends to continue to use the existing rail car fleet.

5.0 Removal Schedule

Removal and subsequent loading operations are planned to start late January and extend through August, with possibility of an earlier finish.

APPENDIX A

Drawings

Drawing number	Title
SK-LSA-I-01	Railcar Loadout of LSA-I Material (Plan)
SK-LSA-I-02	Railcar Loadout of LSA-I Material (Elevation view)

APPENDIX B

APPENDIX B[1]

SP-7 PHASE I SAMPLING PARAMETERS

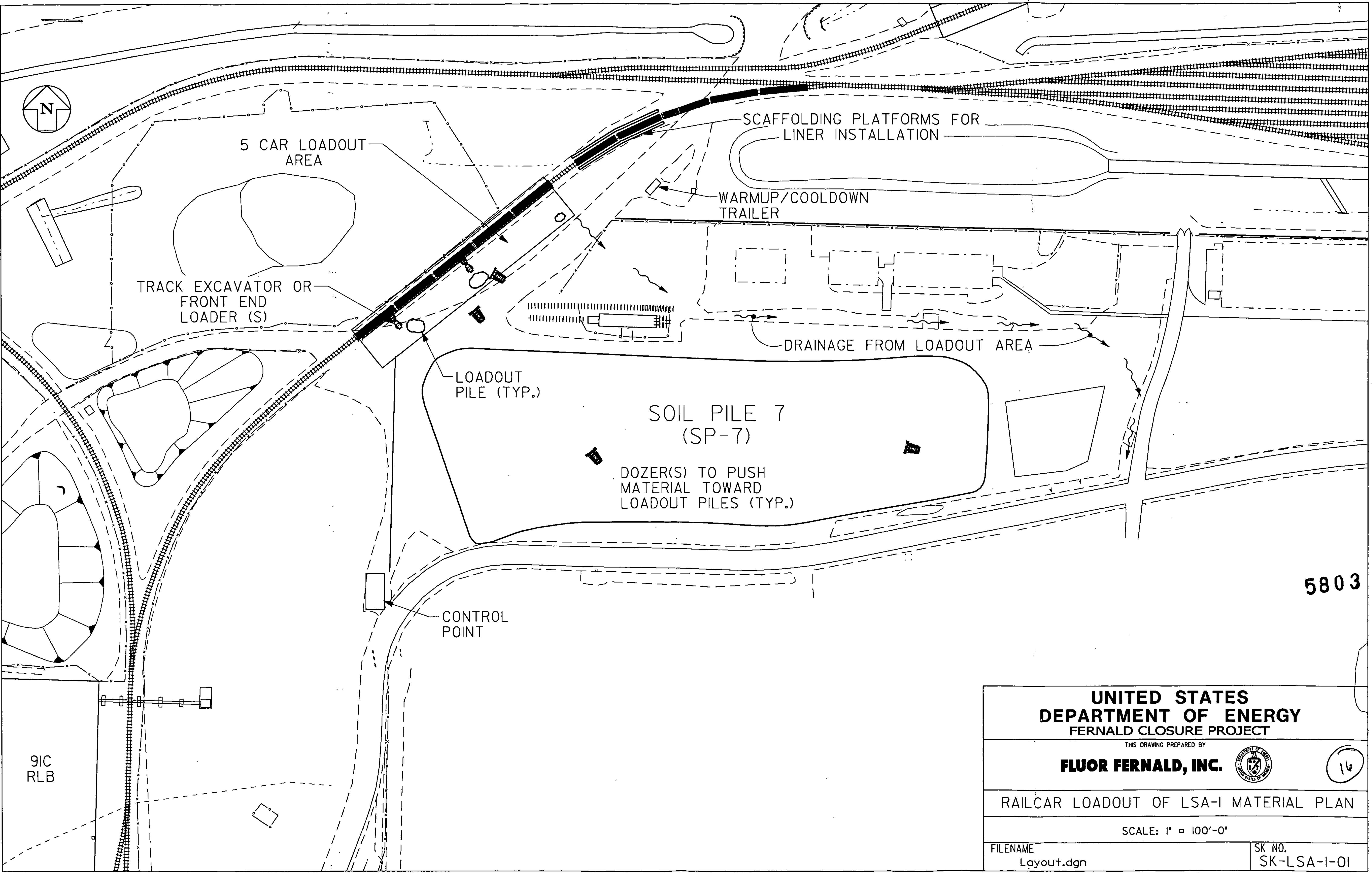
TCLP Inorganics (102 samples)	Organics (2 samples + field screening)		
Arsenic	1,1,1,2-Tetrachloroethane	Benzene	Styrene
Barium	1,1,1-Trichloroethane	Bromobenzene	tert-Butylbenzene
Cadmium	1,1,2,2-Tetrachloroethane	Bromochloromethane	Tetrachloroethene
Chromium	1,1,2-Trichloroethane	Bromodichloromethane	Toluene
Lead	1,1-Dichloroethane	Bromoform	trans-1,2-Dichloroethene
Mercury	1,1-Dichloroethene	Bromomethane	trans-1,3-Dichloropropene
Selenium	1,1-Dichloropropene	Carbon Tetrachloride	Trichloroethene
Silver	1,2,3-Trichlorobenzene	Chlorobenzene	Trichlorofluoromethane
Zinc	1,2,3-Trichloropropane	Chloroethane	Vinyl chloride
Radiological (102 samples)	1,2,4-Trichlorobenzene	Chloroform	2,4,5-TP (Silvex)
Americium-241	1,2,4-Trimethylbenzene	Chloromethane	2,4,5-Trichlorophenol
Cesium-137	1,2-Dibromo-3-chloropropane	cis-1,2-Dichloroethene	2,4,6-Trichlorophenol
Neptunium-237	1,2-Dibromoethane	cis-1,3-Dichloropropene	2,4-D
Potassium-40	1,2-Dichlorobenzene	Dibromochloromethane	2,4-Dinitrotoluene
Radium-226	1,2-Dichloroethane	Dibromomethane	Chlordane
Radium-228	1,2-Dichloropropane	Dichlorodifluoromethane	Endrin
Technetium-99	1,3,5-Trimethylbenzene	Ethylbenzene	gamma-BHC (Lindane)
Thorium-230	1,3-Dichlorobenzene	Hexachlorobutadiene	Heptachlor
Thorium-232	1,3-Dichloropropane	Isopropyl Benzene	Hexachlorobenzene
Uranium-234	1,4-Dichlorobenzene	m,p-Xylene	Hexachloroethane
Uranium-235	2,2-Dichloropropane	Methylene chloride	m,p-Cresol
Uranium-238	2-Butanone	Naphthalene	Methoxychlor
Uranium, Total	2-Chlorotoluene	n-Butylbenzene	Nitrobenzene
Chemistry (102 samples)	2-Hexanone	n-Propylbenzene	o-Cresol
pH	4-Chlorotoluene	o-Xylene	Pentachlorophenol

PCBs (4 samples)	4-Methyl-2-pentanone	p-Isopropyltoluene	Pyridine
Total PCB	Acetone	sec-Butylbenzene	Toxaphene

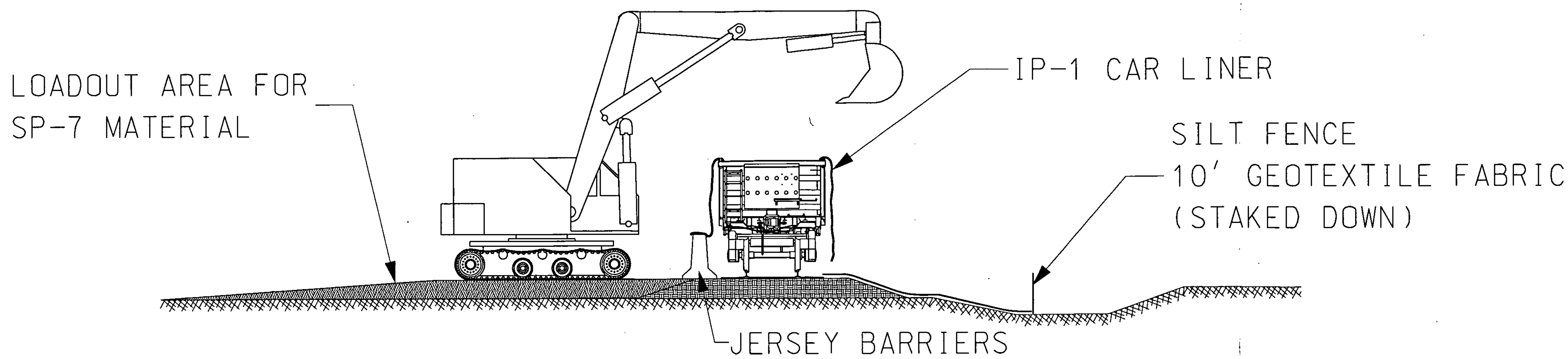
[1] Sample numbers and results are from first phase of SP-7 sampling and reflect approximately 80% of the western portion

MAX/MIN VALUES OF DETECTED ANALYTES OF SP-7 SAMPLES

Radiological			
Parameter	Max Result	Min Result	Units
Americium-241	1.3	0.0821	pCi/g
Cesium-137	0.241	0.0254	pCi/g
Thorium-230	161	0	pCi/g
Thorium-232	6.66	0.303	pCi/g
Neptunium-237	1.18	0.0552	pCi/g
Uranium-234	1401	28.8	pCi/g dry
Uranium-235	67	0.159	pCi/g dry
Uranium-238	1129	3.2	pCi/g dry
Uranium, Total	3390	9.59	mg/kg dry
Radium-226	9.49	0.451	pCi/g
Radium-228	6.66	0.303	pCi/g
Technetium-99	270	1.8	pCi/g
Potassium-40	20.8	5.24	pCi/g
Inorganics			
Parameter	Max Result	Min Result	Units
Barium	2	0.22	mg/L
Cadmium	0.009	0.004	mg/L
Lead	0.52	0.027	mg/L
Mercury	0.00084	0.000472	mg/L
Chromium	0.022	0.0076	mg/L
Selenium	0.068	0.038	mg/L
Silver	0.021	0.0118	mg/L
Zinc	5.4	0.025	mg/L
Chemical			
Parameter	Max Result	Min Result	Units
pH	11.5	8.13	SU
PCBs			
Parameter	Max Result	Min Result	Units
Total PCB	916	10.4	ug/kg
Organics			
Parameter	Max Result	Min Result	Units
Chlorobenzene	510	140	ug/L
Benzene	4.3	4.3	ug/L

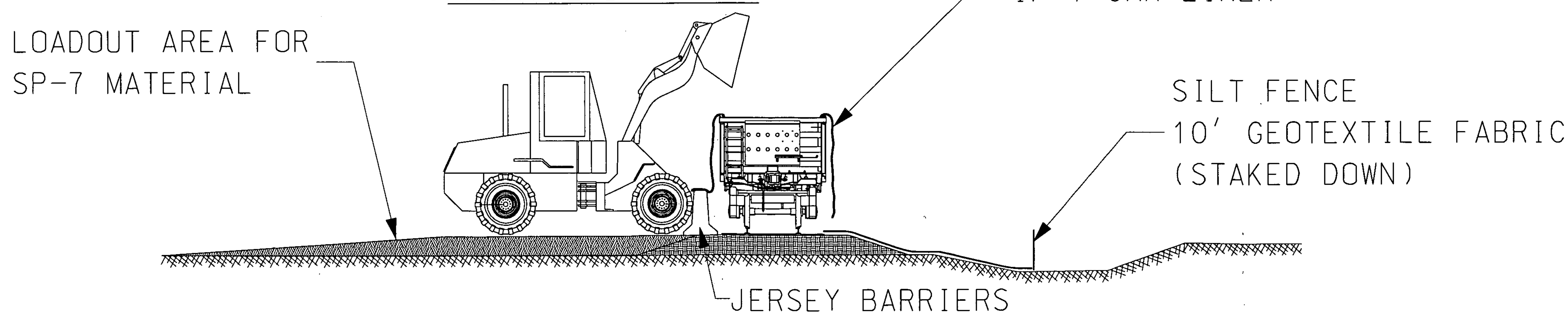

N
5 CAR LOADOUT AREA
SCAFFOLDING PLATFORMS FOR LINER INSTALLATION
WARMUP/COOLDOWN TRAILER
TRACK EXCAVATOR OR FRONT END LOADER (S)
DRAINAGE FROM LOADOUT AREA
LOADOUT PILE (TYP.)
SOIL PILE 7 (SP-7)
DOZER(S) TO PUSH MATERIAL TOWARD LOADOUT PILES (TYP.)
CONTROL POINT
9IC RLB
5803
UNITED STATES DEPARTMENT OF ENERGY
FERNALD CLOSURE PROJECT
THIS DRAWING PREPARED BY
FLUOR FERNALD, INC.
16
RAILCAR LOADOUT OF LSA-I MATERIAL PLAN
SCALE: 1" = 100'-0"
FILENAME Layout.dgn
SK NO. SK-LSA-1-01

BACK HOE LOADER



TYPICAL SECTION @ LOADOUT AREA

FRONT END LOADER



TYPICAL SECTION @ LOADOUT AREA

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RAILCAR LOADOUT OF LSA-I MATERIAL ELEVATION

NO SCALE

FILENAME	SK NO.
SECT.hln	SK-LSA-I-02