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SEP 10 2003

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DOE-0500-03

Mr. Tom Schneider, Project Manager
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Dayton, Ohio 45402-2911

Dear Mr. Jablonowski and Mr. Schneider:

DRAFT REMEDIAL ACTION WORK PLAN FOR THE WASTE RETRIEVAL OPERATIONS – ACCELERATED WASTE RETRIEVAL PROJECT

Reference: Letter from G. Jablonowski to G. Griffths, "Draft Remedial Action Work Plan for the Waste Retrieval Operations," dated August 6, 2003

Enclosed for your approval is the revised Draft Remedial Action Work Plan. The document was revised to incorporate your comment provided in the referenced letter.

If you have any questions, please contact Nina Akgündüz at (513) 648-3110.

Sincerely,

Glenn Griffiths

FCP:Akgündüz

Glenn Griffiths
Acting Director

Enclosure: As Stated

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cc w/enclosure:
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G. Brown, OH/FCP
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REMEDIAL ACTION WORK PLAN

FOR SILOS 1 AND 2 WASTE RETRIEVAL OPERATIONS

40710-PL-0020

Revision 0

September 2003

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1 INTRODUCTION

The Accelerated Waste Retrieval (AWR) project constitutes the initial step in the remedial action for Silos 1 & 2 within Operable Unit 4 of the Fernald Closure Project (FCP). The primary purpose of the AWR Project is to retrieve the material currently stored within Silos 1 & 2 and transfer it to the Transfer Tank Area (TTA) for storage pending final treatment and disposal. The AWR project is also the vehicle at the FCP for the treatment of radon gas that is emitted from the Silos 1 & 2 waste materials. The Radon Control System (RCS), which has been constructed for that purpose, is currently operating. The RCS will be operated to treat radon emissions generated from the headspaces of Silos 1 & 2, the headspaces of the TTA Tanks, and from future operation of the Silo 1&2 Remediation Facility.

This Remedial Action Work Plan (RAWP) addresses the operations associated with:

1) Removal and conveyance of silo bulk waste materials to storage within the TTA;
2) Water management associated with the retrieval, transfer and storage processes;
3) Monitoring and level control for water entering the Decant Sump Tank;
4) Removal and conveyance of silo heel materials to storage within the TTA; and
5) Transfer of silo material from the TTA to the Silos 1 and 2 Remediation Facility.

This RAWP also defines the scope of subsequent Remedial Action documents and specifies appropriate remedial action milestones.

1.1 Related Documentation

The design of the equipment and facilities for the AWR Project is documented in detail in the AWR Project Remedial design package, which was approved by the United States Environmental protection Agency (U.S. EPA) October 4, 2002 and by the Ohio Environmental Protection (OEPA) on April 4, 2003.

Operation of the RCS in the Phase I operating mode (ventilation of the Silo 1 and 2 headspaces) was addressed in the approved RAWP for the Radon Control System, Phase I Operation (40710-PL-0005), approved by the U.S. EPA October 4, 2002 and by the OEPA October 25, 2002.

After transfer from Silos 1 and 2 to the TTA tanks, the Silos 1 and 2 material will be transferred to the Silos 1 and 2 remediation facility for treatment, packaging, and transport to an offsite disposal facility. The design of the Silos 1 and 2 Remediation Facility is documented in the Remedial Design Package for the Silos 1 and 2 Remediation Facility (40750-RP-0028) which was approved by the U.S. EPA on June 4, 2003 and by the OEPA on June 5, 2003.

2 DESCRIPTION OF SILOS 1 AND 2 WASTE RETRIEVAL OPERATIONS

The following sections provide a summary-level description of the operational approach for transfer of the silos 1 and 2 material to the TTA tanks. Additional details concerning the equipment design, controls and methodologies are provided in the AWR Project Remedial Design Package.

2.1 Silo 1 and 2 Waste Retrieval

The Silo Waste Retrieval System (SWRS) utilizes a low to medium pressure (50 to 200 psi), high volume (200 to 350 gpm) liquid stream to dislodge, slurry, and convey Silos 1 and 2 material to the intake of a transfer pump. The transfer pump then conveys the slurried material to a one of four TTA Tanks.

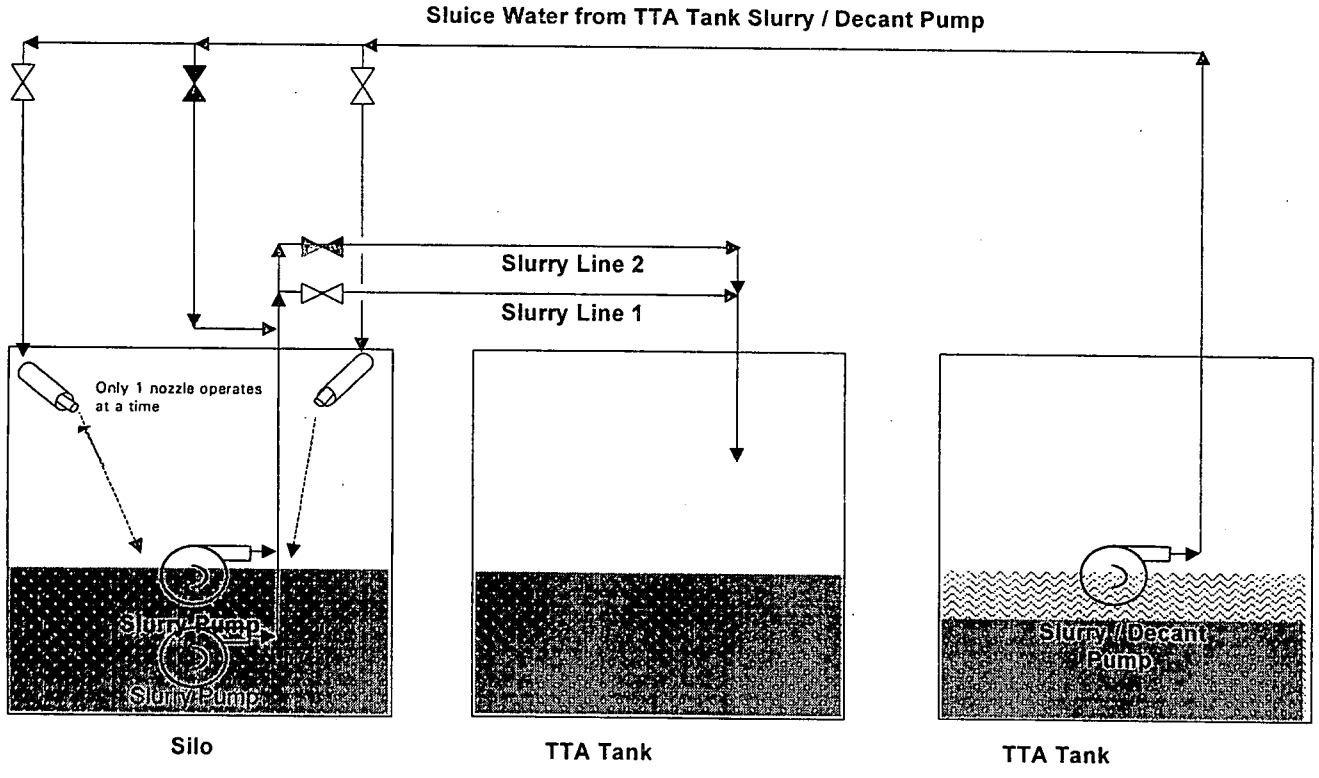
Bulk retrieval of the silo waste material is accomplished using two sluicing nozzles and a slurry pump. Each silo has its own dedicated bulk retrieval equipment. The silo slurry pumps are located in modules on the bridge over the center riser of the silo. The two sluicing nozzles are housed in a module on the bridge over the Silos. The two nozzles are located inline with the slurry pump along the silo's perimeter, approximately 50 ft apart.

Initially, the sluicing nozzle stream(s) are directed as close to the slurry pump inlet as possible to create a slurry pool and form a cavity for slurry to flow into. The slurry pump is lowered into the cavity and turned on when sufficient submergence has been achieved. The sluice nozzle then begins pushing the Silo material towards the pump. As the waste level in the silo decreases, the slurry pump is periodically lowered further into the tank. The total sluicing flow is matched with the slurry pump discharge rate to achieve a steady level of slurry in the silo.

Supernatant (sluice water) is pumped from one TTA Tank to the sluice nozzle(s) in one silo, while slurry retrieved from that silo is pumped to a different Transfer Storage Tank. The concept (see Figure 2.1) depicted is to use supernatant from one TTA Tank to retrieve slurry from one of the silos. The slurry will be pumped into a different Transfer Storage Tank and allowed to settle. In the SWRS mode, supernatant, if available, may be drawn from any of the other three TTA Tanks and supplied to either silo. Depending on level in a particular TTA Tank, retrieved slurry could be pumped to any TTA Tank except the tank from which supernatant is being drawn. In this operating configuration, one silo and two Transfer Storage Tanks are operating, and the other silo and two Transfer Storage Tanks are idle.

Figure 2.1

Silo Waste Retrieval System (SWRS) Operating Mode



2.1.1 Water Management

Modeling and calculations have recently been performed to simulate operation of the SWRS in order to evaluate water management and determine if the objectives of the AWR Project can be achieved. The primary objective was to determine: (1) if the capacity of the TTA tanks is sufficient to support completion of SWRS sluicing before TTA Waste Retrieval System (TWRS) operations begin; (2) what will be the initial water requirements; and (3) finally what if any excess water (wastewater) disposition would be required. The results of the simulation are documented in detail in Report 40710-PL-0019, "Bulk Sluicing Operations Production Plan for Balance of Plant for the Accelerated waste retrieval Project. The conclusions of the simulation are as follows:

- The SWRS can effectively transport the Silo solids into the transfer storage tanks.
- Prior to initiating SWRS operations, an initial "inventory" of approximately 850,000 gal of water in the transfer storage tanks is necessary to allow SWRS operations to proceed smoothly, and have 50,000 gal of water in reserve to allow additional high-pressure water usage requirements
- All of the Silo 1 and 2 material can be adequately stored in the TTA tanks, with 217,000 gal reserve space
- Neither initiation of TWRS operation, nor disposition of excess water, will be required during SWRS operations in order to assure adequate capacity in the TTA tanks

2.1.2 Decant Sump Tank Monitoring / Level Control

The Decant Sump Tank is located underground, just west of and between the silos. Underground drains beneath the silos and underground in the vicinity of the silos drain to the decant sump; therefore, during SWRS activities, the decant sump is monitored to ensure that the SWRS activities do not result in a significant increase in the volume of drainage observed in the decant sump.

Prior to the initiation of SWRS activities, existing liquids will be pumped out of the Decant Sump Tank and a control system, consisting of level instrumentation and a submersible sump pump, will be installed in the decant sump. The discharge of the submersible pump is piped to the TTA tanks. The level instrumentation and the pump are lowered into the Decant Sump Tank through the Decant Sump Tank's 20-in. opening, and will remain in the sump throughout SWRS operations. The level instrumentation continuously monitors both the liquid level in the decant sump and the rate of change in sump's liquid level.

If the level rises in the tank above a set point during SWRS operations, or if the rate of level change increases significantly, an alarm will be triggered, and corrective action will be initiated, consisting of starting the decant sump tank pump to transfer the liquid to the TTA, and/or reducing or shutting off the flow of sluice water into the Silos.

2.2 Heel and Decant Sump Tank Sludge Removal

It is anticipated that at the point when the SWRS is no longer effective in slurrying Silos 1 and 2 material to the TTA, some amount, or heel, of Silo material will remain in the Silos. It is envisioned that a series of steps (e.g., modification of the existing slurry pumps to facilitate pumping to a lower level, replacement of the existing pumps with an alternate pump, removal of the Pump Module and installation of a remote operated vehicle (ROV) will be employed in succession until as much as practical of the heel has been removed and transferred to the TTA.

A similar approach will be utilized in designing the specific method(s) and equipment for removal of the sludge accumulated in the bottom of the Decant Sump Tank.

The detailed design of the specific heel and Decant Sump Tank sludge removal methods will be completed so that the necessary procedures and equipment will be in place and ready for implementation as soon as the SWRS becomes ineffective. The design and methods for heel and Decant Sump Tank sludge removal will be documented for U.S. EPA and OEPA review in a Heel Removal Plan, submitted in accordance with Section 4 of this RAWP.

Although the selected heel and Decant Sump Tank sludge removal processes are expected to be able to accomplish removal of all but minimal residual heel, the potential exists that a 'point of diminishing return' will be reached where the effort, time, and expense, required to remove additional material outweighs any benefit in reduction of risk, exposure, or radon emissions. The endpoint for "complete removal" of material from Silos 1 and 2 and the Decant Sump Tank prior to initiating decontamination and dismantlement (D&D) will be defined by assuring that:

- The specified heel/decant sump sludge removal systems have been employed to remove the Silo contents to the extent reasonably practical;
- Any remaining residual Silo material will not cause appropriate fenceline radon limits to be exceeded; and
- Any remaining residual Silo material does not preclude safe and compliant demolition, transportation, and offsite disposal of the Silo structures

Following heel removal, a small amount of residual material may remain in the silos, the decant sump, or in the soil underneath the silos. For these small quantities of residues and contaminated soil, the DOE will employ a cost effective and protective approach that may differ from the chemical stabilization treatment process employed in the Silos 1 and 2 Remediation Facility. This approach will be developed based on the volume and characteristics of the residues and contaminated soil that remain. Whatever process is employed, the residual will be converted into a form that complies with disposal facility waste acceptance criteria and with applicable transportation regulations prior to shipment and off-site disposal.

2.3 Transfer to the Silos 1 and 2 Remediation Facility

After being retrieved from Silos 1 and 2 and transferred to the TTA tanks, the Silos 1 and 2 material will be transferred to the Silos 1 and 2 Remediation Facility, immediately east of the TTA, for treatment, packaging, and subsequent transportation to an off-site disposal facility. The TTA Waste Retrieval System (TWRS) will utilize past practice sluicing to transfer the waste from the TTA in much the same manner in which it is removed from the silos. The design of the sluicing and slurry systems comprising the TWRS are identical to those in the SWRS operation.

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In the TWRS operating mode, supernatant (sluice water) is pumped from the Remediation Facility to the sluice nozzle(s) in one TTA Tank, and slurry retrieved from that tank is pumped to the Remediation Facility. The concept (see Figure 2-2) is to use supernatant from the Remediation Facility to retrieve slurry from any one of the four TTA Tanks. In this configuration, one TTA Tank is operating and both silos and three TTA Tanks are idle. When slurry transfer is complete, sluice water or process water will be used to flush the slurry lines between the silo and TTA Tank and the Remediation Facility.

In the concurrent SWRS and TWRS mode, transfer of material from Silos 1 and 2 to the TTA, and transfer of material from the TTA to the Silos 1 and 2 Remediation Facility are occurring concurrently (see Figure 2-3). Supernatant (sluice water) is pumped from the TTA Tank to the sluice nozzle(s) in one silo, while slurry retrieved from that silo is pumped to a different TTA Tank. Simultaneously, supernatant (sluice water) is pumped from the Remediation Facility to the sluice nozzle(s) in a third TTA Tank, and slurry retrieved from that tank is pumped to the Remediation Facility. This operation leaves one TTA Tank to operate in the decant mode, in which slurry water and slurry solids separate to generate supernatant on top of the slurry material. When slurry transfer is complete, sluice water or process water will be used to flush the slurry lines between the silos, TTA Tanks, and the Remediation Facility.

Figure 2-2

TTA Waste Retrieval System (TWRS) Operating Mode

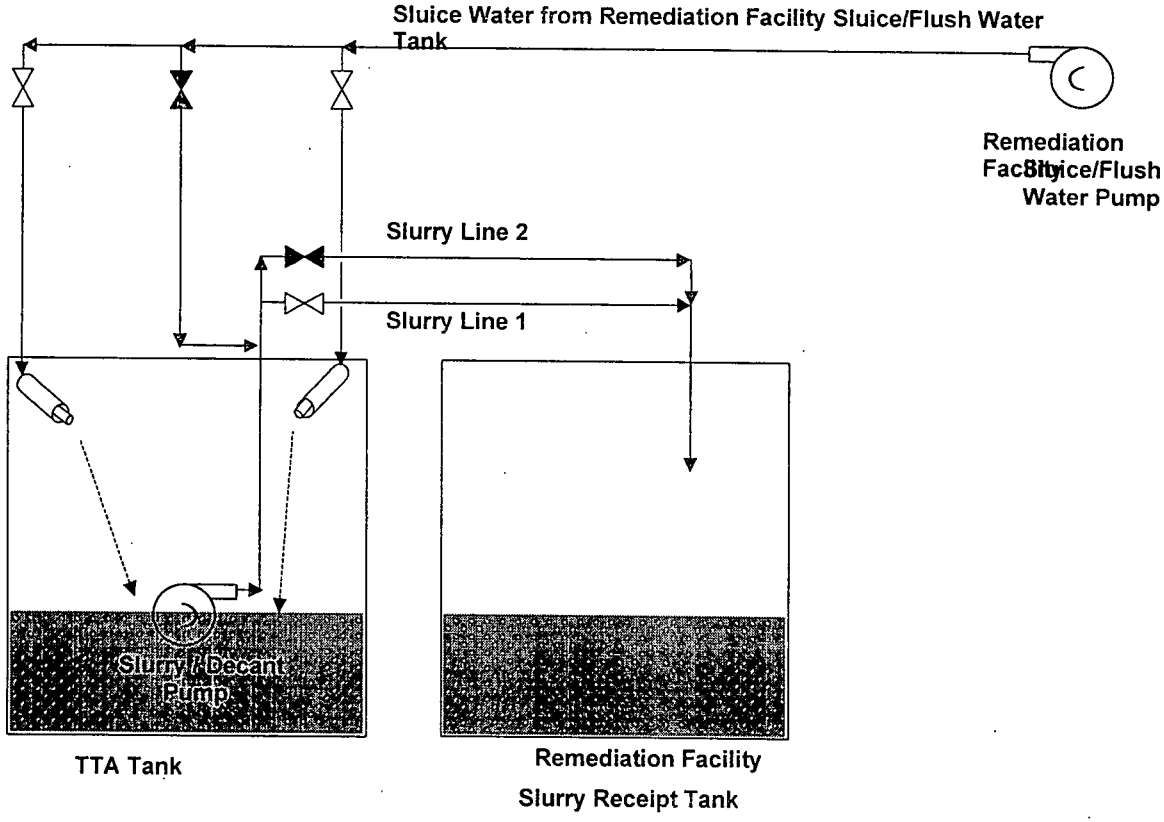
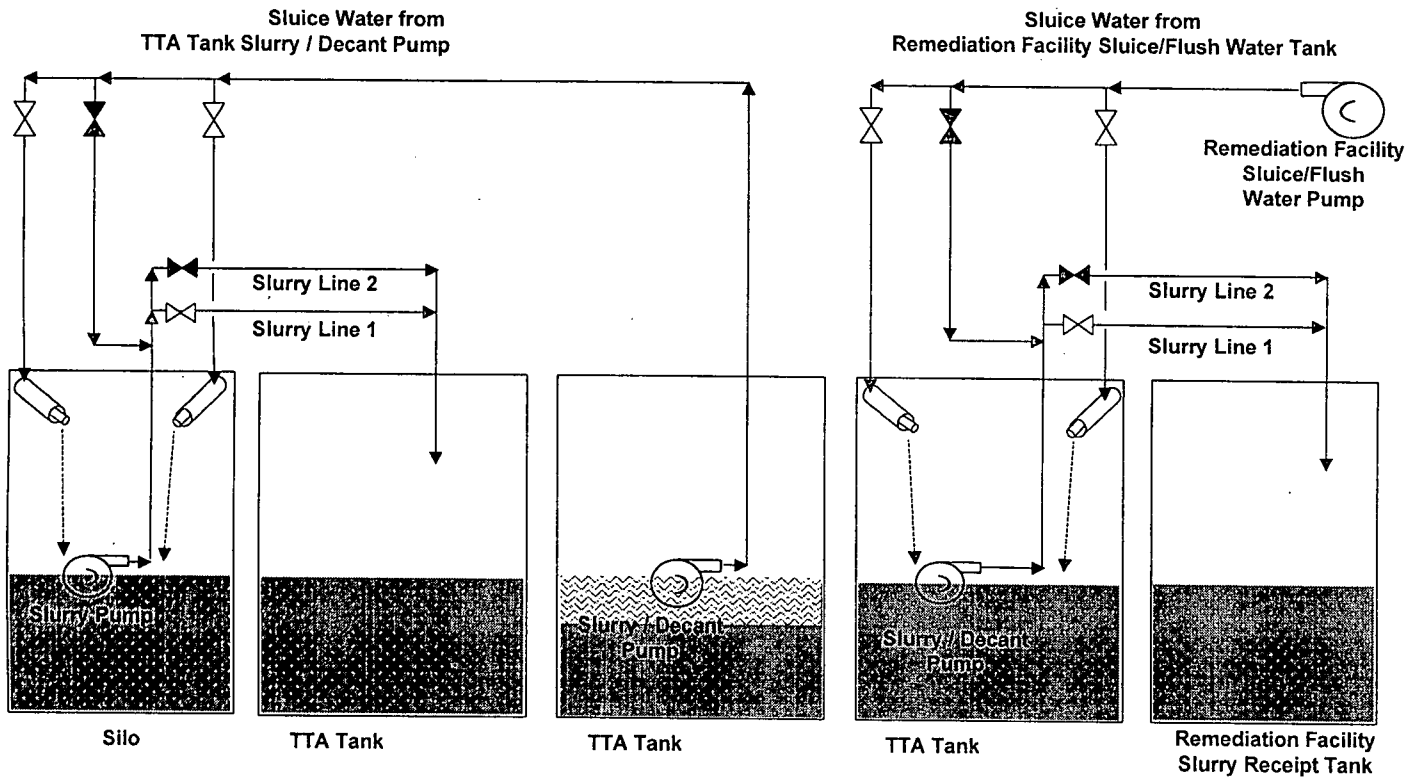


Figure 2-3
Concurrent Silo Waste Retrieval System (SWRS) and
TTA Waste Retrieval System (TWRS) Modes



3 REMEDIAL ACTION DELIVERABLES

The following deliverables will be submitted, according to milestones established in Section 4, to document subsequent aspects of the remedial action for Silos 1 and 2.

3.1 Heel and Decant Sump Sludge Removal Plan

The Heel and Decant Sump Sludge Removal Plan will document the equipment design and method(s) for removal of the residual Silos 1 and 2 material remaining in the Silos after the SWRS is no longer effective, as well as for removal of the sludge accumulated in the Decant Sump Tank. The primary elements of this plan will be:

- The equipment design and method(s) to be employed to remove, to the extent reasonably practical, the heel material and Decant Sump Tank sludge and transfer it to the TTA;
- Definition of the criteria / endpoint for heel and decant sump tank sludge removal; and
- Definition of the means of disposition for any residual material remaining after completion of heel and decant Sump Tank sludge removal.

3.2 Safe Shutdown / D&D Plan

The OU4 ROD and the ROD Amendment for Silos 1 and 2 specify that the Silo 1 and 2 structures, and subsequently the waste retrieval and remediation facilities and equipment, will be "decontaminated and dismantled in accordance with the OU3 ROD." The plans and schedule for decontamination and dismantlement (D&D) of the Silo 1 and 2 structures, the Decant Sump Tank, and the AWR waste retrieval and storage facilities will be documented in the D&D Implementation Plan for the OU4 Complex. In accordance with the OU3 Integrated Remedial Design/Remedial Action (RD/RA) Work Plan, as modified by letter DOE-0343-03, dated April 18, 2003, this D&D Implementation Plan is due to be submitted to USEPA for review by May 28, 2004.

3.3 RA Work Plan for Silos 1 and 2 Remediation Facility

Treatment, packaging and offsite disposal of the Silos 1 and 2 material, subsequent to its retrieval from the Silos and transfer to the TTA, are being implemented under the Silos 1 and 2 Remediation Facility Project. As previously discussed, the design of the necessary treatment, packaging, and transportation infrastructure facilities was documented and approved by the U.S. EPA and OEPA through the Silos 1 and 2 Remediation Facility RD Package. The scope and schedule for the appropriate Remedial Action deliverables for the Silos 1 and 2 Remediation Facility will be specified by the Silos 1 and 2 RA Work Plan, which is due to be submitted to the U.S. EPA for review and approval by June30, 2004.

4 MILESTONES

ACTIVITY / DELIVERABLE	MILESTONE
Submit Heel / Decant Sump Tank Sludge Removal Plan to U.S. EPA for review	December 1, 2003
Submit D&D Implementation Plan for the OU4 Complex to U.S. EPA for review	May 28, 2004[1]
Submit Silos 1 and 2 Remedial Action Work Plan to U.S. EPA for review	June 30, 2004[2]
Initiate Silo Waste Retrieval Operations	September 8, 2004

[1]Existing milestone established by the OU3 Integrated RD/RA Work Plan (2503-WP-0023, rev 0), May 1997, as modified by letter DOE-0343-03, 4/18/03

[2]Existing milestone established by the Remedial Design Work Plan for Operable Unit 4 Silos 1 and 2 Project (40700-WP-0003, Rev 2), September 2001