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NITRIC ACID TANK CAR AND AREA HAZARDOUS WASTE MANAGEMENT UNIT NO. 9 CLOSURE CERTIFICATION - OCTOBER 1994

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REPORT

OEPA

Fernald Environmental Management Project

NITRIC ACID TANK CAR AND AREA

Hazardous Waste Management Unit No. 9

Closure Certification

October 1994

U. S. Department of Energy
7400 Willey Road
Fernald, Ohio 45030

Fernald Environmental Management Project

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1.0 INTRODUCTION

1.1 Purpose

This certification report provides a summary of the activities conducted to clean close the Nitric Acid Tank Car and Area (HWMU No. 9) (referred to as Tank Car) and completes the requirements for closure established in the Ohio Administrative Code (OAC) 3745-66-15. This certification report was prepared in accordance with the *Ohio EPA Closure Plan Review Guidance, Interim Final, September 1993 (OEPA Guidance).*

1.2 Background

The combined Removal Action Work Plan/Closure Plan Information and Data (RAWP/CPID) was submitted jointly to OEPA and USEPA on October 29, 1992. Upon incorporation of comments, a revised RAWP/CPID (hereafter referred to as the Plan) was submitted on April 21, 1993, to OEPA and USEPA. OEPA approved the RAWP portion on May 26, 1993, and the CPID portion on August 31, 1994.

The field activities to implement the Plan were initiated in August 1993 and were completed in October 1993. The *Final Report* was submitted to OEPA and USEPA on November 12, 1993, and was approved by USEPA on December 9, 1993, pending OEPA's concurrence that RCRA Closure requirements have been met.

1.3 Unit Description

The Tank Car was approximately 36 feet long and consisted of a 100,000 pound capacity stainless steel tank mounted on a railway carriage. The tank was 6 feet in diameter and was accessed by a 3 feet diameter manway located at the tank's midpoint. The Tank Car was located on a railway siding in the northeast corner of the Fernald Environmental Management Project (FEMP) within Operable Unit No. 3 (OU3). The Tank Car, and that portion of the FEMP site interior track system on which the car resided, constituted HWMU No. 9. The boundary of the HWMU was 40 feet long by 14 feet wide, encompassing 560 square feet. Rail tracks and bare ground extend beyond the boundary of the HWMU.

Visual inspections of the Tank Car indicated that it contained a relatively small amount of liquid, estimated at between 50 to 100 gallons. Though small, the volume was sufficient to preclude exemption from the hazardous waste classification under the "empty container rule" (40 CFR 261.7 and OAC 3745-51-07), which states that a container of greater than 110 gallons can contain no more than 0.3 percent by weight of its capacity and still be considered "empty". After FEMP production ceased in 1989, the material in the Tank Car was not considered unused acid, nor was it intended for future use.

Sample analyses revealed that the Tank Car contents were approximately 3 normal (N) nitric acid with a pH less than 1 and contained 1,600 milligrams per liter (mg/L) chromium. The uranium concentration was approximately 1,400 picocuries per liter (pCi/L) on a specific activity basis assuming natural uranium. As a result of the low pH and high chromium concentration, the Tank Car contents were considered a RCRA hazardous waste due to the characteristics of corrosivity and toxicity (D002, D007). Due to the radiological content, the Tank Car contents were also considered a mixed waste.

There were no visible signs of deterioration of the tank or carriage, but wooden blocks on which the tank was resting were noticeably degraded. Daily inspections of the Tank Car and Area were conducted at the time HWMU No. 9 was established, in accordance with 40 CFR 265.195, OAC 3745-66-95, and did not reveal evidence of waste material leaking from the tank.

2.0 SUMMARY OF CLOSURE ACTIONS

Closure activities for HWMU No. 9 have met the following performance standards (OAC 3745-66-11 and 40 CFR 265.111) as presented in the approved Plan:

- Minimize the need for further maintenance (or inspection) by decontaminating and removing the Tank Car. Post-closure maintenance is not required where no hazardous wastes or unacceptable levels of contamination remain after closure (i.e., clean closure).

- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the escape of hazardous waste or hazardous constituents.

- Conduct closure actions in accordance with the substantive provisions of an approved RCRA Closure Plan.

Clean closure was accomplished by removing the contents and flushing the Tank Car's internal surfaces with water sprays to remove residual traces of the nitric acid and its contaminants. The Tank Car was declared clean based on a review of the rinseate analyses, which demonstrated that the pH measurements were between 6.0 and 9.0, chromium levels were less than 0.75 mg/L, and nitrate concentrations were below 10 mg/L (Table 1). The soil and track ballast within the HWMU boundary were excavated and sampled for the presence of chromium, pH, nitrates, and additional constituents (Table 2 and 3). The analyses for the additional constituents were done as part of the Removal Action portion of the Plan to support the Remedial Investigation/Feasibility Study (RI/FS) process. This Closure Certification Report documents that closure actions met the RCRA requirements of the Plan.

2.1 Cleanup Action Levels

2.1.1 Tank Car Decontamination Rinseate

Decontamination Action Levels (DALs) for the Tank Car rinseate were established in the Plan (Section 4.0) and are provided in Table 4 of this report. The DALs indicated that decontamination rinseates must meet the following levels to achieve clean closure:

(1) Fifteen times the public drinking water Maximum Contaminant Level (MCL) for hazardous waste constituents as promulgated in 40 CFR § 141.11 and OAC 3745-81-11 for inorganics;

(2) If an MCL is not available for a particular contaminant, then fifteen times the Maximum Contaminant Level Goal (MCLG) as promulgated in 40 CFR § 141.50; or

(3) If the product of fifteen times the MCL or MCLG exceeds 1 mg/L or if neither an MCL nor an MCLG is available for a particular contaminant, then 1 mg/L will be the standard.

Based on these clean closure criteria, decontamination of the Tank Car was determined to be complete when the final rinseate samples contained concentrations of analytes at the following levels:

(1) Chromium concentration below 0.75 mg/L.

(2) A final pH within the 6.0 to 9.0 range.

(3) Nitrate concentration below 10.0 mg/L.

2.1.2 Soil and Track Ballast

The Cleanup Action Levels (CALs) for the soil and track ballast (gravel) were established in the Plan (Section 4.0). The clean closure standard for pH in soils is 4.7 to 9.0. The soil CAL for metals is based on the mean background concentration plus two standard deviations as determined by the *FEMP Background Soil Study*. Using the information provided in the *FEMP Background Soil Study*, the CAL for chromium was calculated to be 16.3 milligrams per kilogram (mg/kg). The *OEPA Guidance* document provides background clean standards for "Naturally Occurring Elements or Compounds" when site-specific background data are not available.

Since the *FEMP Background Soil Study* does not provide a CAL for nitrates, the CAL is obtained from *OEPA Guidance* which references the Background Levels of Heavy Metals in Ohio Farm Soils, by Logan and Miller, February 1983. Specifically, "Table 2 - Background Analyses for All Farms for pH, Nutrients and Heavy Metals," provides the mean background concentration plus two standard deviations for total nitrogen (i.e., Total Kjeldahl Nitrogen) as 5700 micrograms per gram (μg/g) which is equivalent to 5700 mg/kg.

2.2 Changes to the Approved Plan

2.2.1 Cleanup Action Level Correction for Chromium in Soil

Section 4.1.1 of the approved Plan incorrectly identified the upper tolerance level (17.8 mg/kg) as the mean background concentration plus two standard deviations for chromium in soil. The correct cleanup action level for chromium in soil is 16.3 mg/kg.

2.2.2 Decontamination Action Level Correction for Nitrates

Section 4.1.2 of the approved Plan incorrectly identifies nitrates as a hazardous waste constituent of concern for the closure activity. The OEPA, Hazardous Waste Division (Columbus Office), was contacted on September 22, 1993, for additional guidance in the development and application of a DAL for nitrates. OEPA staff indicated in the Telephone Conversation Report, Attachment A, that OEPA does not consider nitrates to be a hazardous waste in the context of HWMU closures, and not all MCLs or MCLGs are necessarily considered when determining DAL requirements. As a result, decontamination of the Tank Car and verification of soil excavation were not contingent upon achieving the nitrate DALs.

However, the nitrate DAL for rinseates (1 mg/L) was revised to its MCL value of 10 mg/L and the nitrate DAL for soils (5700 mg/kg) did not change.

2.2.3 Disposition of Rinseate to Tank F1-24

Section 3.4.5.1 of the approved Plan specified that the Tank Car contents and the decontamination rinseate would be transferred to and treated through the Uranyl Nitrate Hexahydrate (UNH) System. The liquid wastes (contents and rinseate) were actually transferred from the Tank Car to the Nitric Acid Recovery (NAR) System Tank F1-24 at Plant 2/3. The plan also called for the final rinse to be transferred to Tank 17 of the Waste Water Treatment System, but was pumped, instead, to Tank F1-24. This information was forwarded to OEPA in the *Final Report (October 1993)*.

The NAR System was selected over the UNH System because the Tank Car contents and rinseate were more compatible with the 26,000 gallons of nitric acid already stored in Tank F1-24. Tank F1-24 is identified as storing characteristic hazardous waste (chromium [D007] and corrosivity [D002]) that will be dispositioned through the UNH Treatment System.

2.2.4 Survey and Monument HWMU Boundary

Section 3.2.2.1 of the approved Plan states that a survey crew will establish the boundary of the HWMU area relative to established FEMP Site benchmarks. This formally established boundary will be monumented to preserve the physical identity of the HWMU after the Tank Car is moved. As a clarification, the corners of the HWMU were surveyed relative to permanent site benchmarks and formally documented in the FEMP Drafting Database to allow recovery of the physical identity of the HWMU. Permanent survey monuments were determined to be unnecessary.

2.2.5 Sample Analyses Deviations

Two differences in analyses identified in the Plan occurred. Analytical Support Levels (ASLs) for soil were indicated as ASL C and ASL D. This was done as specified to characterize the soil samples. Verification soil samples, although not directly specified in the Plan, were conducted as ASL B to allow a more rapid turnaround of analytical results than would have been provided under ASL C and D. Also, gamma spectroscopy for liquid samples was specified in the Plan but was not requested based on the performance of uranium isotopic analyses. Gross alpha and beta analyses were requested and performed, however, because the gross alpha and beta results were not critical to this action, they are not presented herein.

2.3 Closure Methodology

The goals of the Plan were to remove the Tank Car contents; decontaminate and dispose of the Tank Car; characterize the contamination status of the soil underlying the Tank Car within the bounds of the Tank Car and area; and remove soil, as necessary, to achieve clean closure.

2.3.1 Tank Car Relocation and Contents Removal

The Tank Car was moved on August 26, 1993, to the Main Tank Farm. After the Tank Car was moved to the Main Tank Farm, the tank was opened, monitored, and its contents were sampled. The Tank Car contained approximately 100 gallons of waste nitric acid. The contents were pumped into a portable tank and transferred to Tank F1-24 of the NAR System for ultimate disposition via the UNH System.

2.3.2 Tank Car Decontamination and Disposal

Flushing the Tank Car was conducted in three stages, involving a total of five rinses to remove residual acid and any solids that were present. Each rinse consisted of 100 gallons of water from a known source that had a pH of 8.98. In the first stage, three separate rinses were performed and the total rinseate (approximately 300 gallons) was combined with the Tank Car contents in the dumpster tank. The first rinse was conducted on August 27, 1993, with the second and third rinses on August 28, 1993. Each rinseate was tested in the field for pH.

In the second stage, a fourth rinse was performed on August 28, 1993, to confirm that sufficient rinsing of the tank had occurred. Samples of the rinseate were collected and submitted for laboratory analysis prior to transfer of the fluid to a separate dumpster tank. Because the results indicated the pH and nitrate were out of the cleanup action range, a third stage was added to conduct a final fifth rinse. The fifth rinse was performed and sampled on September 23, 1993. The total volume of nitric acid and rinseate added to Tank F1-24 equaled 600 gallons.

The Tank Car's external surfaces were confirmed to be free from significant radiological contamination. Following evaluation of the final rinseate analytical results, the Tank and rail car undercarriage were separated, the tank was cut open to prevent its reuse, and both components were transferred to the scrap metal holding area during the week of October 4, 1993.

2.3.3 Soil and Track Ballast Excavation

As identified in the Plan, the potential source contaminant from the Tank Car, was chromium. Analyses for this constituent and seven other metals were requested for the purpose of characterization. Analyses was also performed for pH and nitrate, based on the presence of nitric acid. Characterization of the seven toxicity characteristic metals also supported the selection of interim management options, as necessary, for any excavated soil. Soil removal from HWMU No. 9 was guided by the collection of soil samples, with the extent and confirmation of the excavation based on analytical results.

The surface soils within the Tank Car and Area HWMU, and one location outside the HWMU, were sampled and analyzed. Elevated concentrations of chromium relative to background were detected in the soil (Table 2). The background mean plus two standard deviations for chromium is 16.3 mg/kg. Twelve inches of surface soil and overlying track ballast were excavated within the HWMU area.

Six verification samples were collected to demonstrate sufficient soil removal to reduce chromium concentrations in soil remaining within the HWMU to below the standard of clean. No further soil removal was conducted following collection and analysis of the verification samples from the base of the excavation, because the analysis indicated residual levels of chromium ranging from 10.8 mg/kg to 16.02 mg/kg (Table 3). Disposition of the excavated soil is discussed in Section 2.5 of this report.

Although the chromium concentrations in the excavated surface soil were above the FEMP background levels, the chromium concentrations are not likely to be the result of releases from the Tank Car for the following reasons:

- Daily monitoring of the Tank Car has been conducted since 1991. This monitoring verifies that no leaks have occurred during that time. While the rails exhibit normal rust and staining, there is no visual evidence on the tank, tracks, or ground of past spills from the Tank Car.

- Process knowledge indicates there were no material transfers to/from the tank at this location. Material transfers took place elsewhere, and the Tank Car was moved to the HWMU location for storage only.

- The measured concentrations of metals in surface soil are fairly uniform throughout the area sampled, indicating an area-wide source rather than a point source. In the event of a point-source discharge from the Tank Car, resulting soil contamination would be expected to remain localized, and not produce uniformly distributed concentrations.

- Metal concentrations exceeded the mean soil background concentration plus two standard deviations for five of the eight metals analyzed; however, chromium was the only metal detected at an elevated concentration in the Tank Car contents. Further, the relative concentrations of the five metals are reasonably constant across all sampling locations, potentially indicating a common non-point source.

2.3.4 Sample Collection

Implementation of the Plan required samples of both liquids and soil to be collected for submittal to laboratories for analysis. Liquid sampling included the tank contents and tank rinseates. Soil sampling included initial sampling of gravel and soil, as well as confirmation sampling following soil removal. Analytical results are provided in Table 1 for liquid samples and Tables 2 and 3 for soil samples.

Additional sampling was conducted outside the HWMU boundary to further investigate the extent of soil contamination for future CERCLA activities. Eleven surface soil samples were collected and analyzed for toxicity characteristic metals. Analytical results indicated elevated levels of chromium and lead encompassing the Tank Car and Area. This information has been provided to Operable Unit No. 5 (OU5) for incorporation into the OU5 RI/FS.

Quality Assurance/Quality Control (QA/QC) samples and procedures accompanied all liquids and soil sampling events, with each sample set including a field blank, rinseate blank, and sample duplicate. Complete data packages including laboratory QA/QC results are maintained in the FEMP CRU3 Project Files along with other closure specific information as discussed in Section 3.2 of this report.

2.4 Review of Analytical Data

A review of the analytical data demonstrates that clean closure of HWMU No. 9 has been achieved.

2.4.1 Tank Car Contents and Decontamination Rinseate

Samples of the tank contents were submitted to laboratories for analysis of pH, nitrates (nitrate and nitrite as nitrogen), total TCLP-list metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and total and isotopic uranium (Table 1). Samples of rinseates for rinses one through three were only analyzed for field pH. The fourth rinse was sampled and analyzed for the same analytes as the tank contents. The fifth rinse, which was conducted because the pH and nitrate concentration of the fourth rinse were out of the target range, was analyzed for only pH and nitrates. Field pH values for the tank contents and the four rinseates were determined using litmus paper. Field probes for pH and nitrates were used for the fifth rinse.

Analysis of the final (fifth) rinseate shows nitrates, which is not a hazardous waste constituent, to be 3.47 mg/L and less than the DAL of 10.0 mg/L. A pH of 6.00 in the fifth rinse is within a DAL range of 6.0 to 9.0. The fourth rinse established that the chromium level of 0.542 mg/L was below the 0.75 mg/L DAL as discussed in Section 2.1.1 of this report.

2.4.2 Soil and Track Ballast

Soil and track ballast samples were collected from six locations: five locations within the HWMU boundary and one location outside the HWMU boundary. The analytical results in Table 2 indicate that excavated soils do not contain hazardous waste and the levels of radiological contamination classify it as a Category I soil in accordance with Removal Action 17 (RA 17), *Improved Storage of Soil and Debris*, interim management guidelines.

Initial analyses of the surface soil and track ballast (Table 2) identifies chromium levels of 3.9 mg/kg to 22.6 mg/kg, pH levels of 7.18 to 8.22, and nitrate levels, as NO_2/NO_3, of 1.2 mg/kg to 10.2 mg/kg. Twelve inches of surface soil and track ballast were removed. Verification soil samples (Table 3) collected from the base of the excavation had residual levels of chromium ranging from 10.8 mg/kg to 16.0 mg/kg which verifies the cleanup action levels have been attained (Table 4).

2.5 Waste Management

2.5.1 Tank Contents and Rinseates

Management of liquid wastes (i.e., tank contents and decontamination rinseate) is provided in Section 2.3.3 of this Closure Certification Final Report. The 600 gallons of liquid waste are currently stored in Tank F1-24 of the NAR System at Plant 2/3.

2.5.2 Tank Car and Railway Materials

The Tank Car was dismantled after decontamination and delivered to the FEMP scrap metal pile, segregating the tank to the stainless steel pile and the undercarriage to the carbon steel pile. The railway materials consisted of steel rails and wooden ties that were removed to allow excavation of the underlying soil. The materials are currently being stored on plastic pending future reuse/recycling.

2.5.3 Excavated Soil and Track Ballast

The excavation of surface soil within the HWMU yielded both soil and gravel. Once the soil analyses were complete and demonstrated that no hazardous, low-level, or mixed waste was present, the drummed soil and subsequent excavation soils for the entire HWMU were used as backfill for the Pilot Plant Sump excavation with the remainder transferred to stockpiles for interim management in accordance with RA 17. The soil removal yielded approximately 20 cubic yards of soil placed in a separate stockpile.

OEPA comments on the *Final Report (October 1993)* indicated that the use of excavated HWMU soils for backfill was not intended under RA 17. DOE has since revised the Work Plan for RA 17 to provide specific requirements for managing soil from HWMUs.

2.5.4 Sampling Waste and Personal Protective Equipment

Sampling wastes included wash and rinse waters from decontamination activities and samples returned by the laboratories following the analyses. Decontamination water and returned sample water was combined with the tank contents and rinseates water in the storage container and processed along with those wastes. Samples returned following disposition of the other liquid wastes were disposed of separately but in the same fashion. Soil samples returned from the laboratory were added to the excavated soil stockpile.

Personal protective equipment (PPE) was worn during field activities. Two categories of protective clothing wastes were generated: disposable and reusable. Examples of disposable protective clothing were surgeon's gloves, and examples of clothing that could be decontaminated and reused were booties and respirators. The small quantities of PPE wastes generated by the activities were disposed of, or cleaned and reused, in accordance with existing SOPs (FMPC-0515, FMPC-2128, RM-0009I, FMPC-2152).

3.0 CONCLUSIONS

This Closure Certification Report demonstrates that HWMU No. 9, Nitric Acid Tank Car and Area, has been clean closed. The HWMU rinseate analyses confirm decontamination of the Tank Car by meeting the decontamination action levels for pH, chromium, and nitrates. In addition, verification soil sample analyses confirm the excavation removed the elevated concentrations of chromium from the HWMU thereby meeting the DALs for pH, chromium, and nitrates.

3.1 Closure Certifications

Attachment B to this Closure Certification Report contains the FEMP Closure Certification Statements (following the format in OAC 3745-50-42(d)) of the Owner and Operator, Co-Operator, and the Professional Engineer which document that HWMU No. 9 was closed in accordance with the approved closure plan, as required under OAC 3745-66-15.

3.2 Supporting Documentation

Attachment C to this Closure Certification Report contains excerpts from the Professional Engineer's Log Book. These excerpts are field notes recorded daily documenting closure activities.

Inspections of the Nitric Acid Tank Car HWMU area were discontinued on July 19, 1994, following direction from OEPA. In addition to the information provided in this report, the following supporting documentation for this HWMU closure will be maintained at the FEMP and made available if requested for OEPA review:

- A copy of the approved RAWP/CPID
- The Safe Shutdown Program and Task-Specific Implementation Plans (Including applicable FEMP Standard Operating Procedures identified)
- Task-Specific Training and Health and Safety Plans
- Copies of Safe Shutdown Supervisor's Logs
- Copy of Sampling Logs
- Copy of Project Engineer's Log
- Sampling Field Logs
- Completed Sample Chain-of-Custody/Analytical Request Forms
- Laboratory Analytical Results and Data Validation Records
- Waste Material Evaluation Forms

Table 1. Liquid Analytical Results.

Analytes	Sample Identification						
	DAL	Tank Contents	1st Rinseate	2nd Rinseate	3rd Rinseate	4th Rinseate	5th Rinseate
Total Chromium (mg/L):	0.75	2,030	NA	NA	NA	0.542 J	NA
Other Metals (mg/L):							
Arsenic	0.75	0.27 J	NA	NA	NA	0.0047 J	NA
Barium	1.0	1.47 J	NA	NA	NA	0.0041 UJ	NA
Cadmium	0.15	0.271 J	NA	NA	NA	0.005 UJ	NA
Lead	0.75	0.199 J	NA	NA	NA	0.001 UJ	NA
Mercury	0.03	0.00057	NA	NA	NA	0.0001 UJ	NA
Selenium	1.0	0.002 R	NA	NA	NA	0.002 R	NA
Silver	0.15	0.0175	NA	NA	NA	0.001 UJ	NA
pH:	6.0 to 9.0	0.14	1	3	4	3.22	6.00
NO_3/NO_3-N (mg/L):	10	47,300	NA	NA	NA	146	3.47
Radionuclides:							
Total Uranium (mg/L)	NA	0.201 J	NA	NA	NA	0.0002 J	NA
U-234 (pCi/L)	NA	NA	NA	NA	NA	0.2 U	NA
U-235 (pCi/L)	NA	NA	NA	NA	NA	0.1 U	NA
U-238 (pCi/L)	NA	NA	NA	NA	NA	0.2 U	NA

Laboratory Data Qualifiers:
U = The analyte concentration was not greater than the minimum detectable concentration (MDC) reported for the method
UJ = The analyte concentration was not greater than the MDC but deficiencies in data quality make the non-detect estimated
J = The analyte concentration was detected at a level greater than the MDC but deficiencies in data quality make the detection estimated
R = Deficiencies in data quality make the results unusable
N = Presumptive evidence exists for the presence of the analyte but the concentration cannot be quantified due to deficiencies in data quality
NV = The analytical result was not validated
Notes:
NA = Not analyzed

Table 2. Soil Characterization Analytical Results.

Analytes	Sample Identification											
	Background (Mean + 2xSD)	Soil 1a[a]	Soil 1b	Soil 2a[a]	Soil 2b	Soil 3a[a]	Soil 3b	Soil 4	Soil 5	Soil 6[b]	Geometric Mean[c]	Standard Deviation[c]
Total Chromium (mg/kg):	16.3	3.9	18.8	4.3	17.8	4.2	19.2	22.2	22.6	22.3	20.39	2.12
Other Metals (mg/kg):												
Arsenic	8.6	20.2 UJ	20.4 UJ	20.1 UJ	23.1 UJ	20.1 UJ	21.4 UJ	18.7 UJ	21.2 UJ	24.5 UJ	ND	ND
Barium	174.5	269 J	93.3 J	15.1 J	98.4 J	11.4 J	154 J	151 J	134 J	156 J	128.31	28.45
Cadmium	0.78	1.2 UJ	1.9 J	1.2 UJ	1.3 UJ	1.2 UJ	1.8 J	1.1 UJ	1.2 UJ	1.4 UJ	1.85	0.07
Lead	27.3	14.6 UJ	19.3 J	16.7 J	24.6 J	31.2 J	32 J	196	22.4 J	27.9 J	35.07	69.85
Mercury	0.16	0.06 U	0.06 UJ	0.18 U	0.11 U	0.09 U	0.65 J	0.14 U	0.36 U	0.96 J	0.79	0.22
Selenium	0.55	6.4 UJ	6.4 UJ	6.3 UJ	7.3 UJ	6.3 UJ	6.7 UJ	5.9 UJ	6.6 UJ	7.7 UJ	ND	ND
Silver	1.4	3.1 U	3.1 U	3 U	3.5 U	3 U	3.2 U	2.8 U	3.2 U	3.7 U	ND	ND
TCLP Metals (ug/L):												
Lead	--	NA	0.039 UJ	NA	NA	NA	NA	0.047 J	NA	NA	0.05	ND
Mercury	--	NA	0.0001 U	NA	NA	NA	NA	NA	NA	NA	ND	ND
pH:	4.7 to 9.0	7.89	7.92	7.71	8.09	8.22	7.86	7.9	7.18	7.97	7.81	0.32
NO_2/NO_3-N (mg/kg):	5700	NA	1.68	NA	2.02	NA	1.2	1.72	10.2	1.31	2.13	3.53

Table 2. Soil Characterization Analytical Results.

Analytes	Sample Identification											
	Background (Mean + 2xSD)	Soil 1a[a/]	Soil 1b	Soil 2a[a/]	Soil 2b	Soil 3a[a/]	Soil 3b	Soil 4	Soil 5	Soil 6[b/]	Geometric Mean[c/]	Standard Deviation[c/]
Radionuclides:												
Total Uranium (mg/kg)	--	5.1 J	19.5	9.9 J	7.2	14.6 J	5.1	80.4	4.2	30.8 J	13.97	26.70
U-234 (pCi/g)	--	2.6	3.2	2.5	2.3	3.9	2.0	26.6	1.5	3.9	3.63	8.99
U-235 (pCi/g)	--	0.2	0.3	0.2	0.2	0.2	0.1	1.5	0.1	0.2	0.24	0.50
U-238 (pCi/g)	--	2.6	4.2	2.8	2.0	4.5	2.2	30.8	1.8	4.0	4.00	10.46

Laboratory Data Qualifiers:
U = The analyte concentration was not greater than the minimum detectable concentration (MDC) reported for the method
UJ = The analyte concentration was not greater than the MDC but deficiencies in data quality make the non-detect estimated
J = The analyte concentration was detected at a level greater than the MDC but deficiencies in data quality make the detection estimated
R = Deficiencies in data quality make the results unusable
N = Presumptive evidence exists for the presence of the analyte but the concentration cannot be quantified due to deficiencies in data quality
NV = The analytical result was not validated

Notes:
NA = Not analyzed
ND = Not detected
a/ = Track ballast sample consisting of gravel
b/ = Sample location is outside of HWMU
c/ = Calculated for detections only in soil samples; excludes track ballast samples Soil 1a, Soil 2a, and Soil 3a.

Table 3. Soil Excavation Verification Results.

Analytes	Background (Mean + 2xSD)	Soil 1c	Soil 2c	Soil 3c	Soil 4b	Soil 5b
Total Chromium (mg/kg):	16.3	16.02	10.8	12.6	11.73	12.53
TCLP Chromium (mg/L):	--	NA	NA	NA	0.01 U	0.01 U
pH:	4.7 to 9.0	NA	NA	NA	NA	NA
NO_2/NO_3-N (mg/kg):	5700	NA	NA	NA	NA	NA

Laboratory Data Qualifiers:
U = The analyte concentration was not greater than the minimum detectable concentration (MDC) reported for the method
UJ = The analyte concentration was not greater than the MDC but deficiencies in data quality make the non-detect estimated
J = The analyte concentration was detected at a level greater than the MDC but deficiencies in data quality make the detection estimated
R = Deficiencies in data quality make the results unusable
N = Presumptive evidence exists for the presence of the analyte but the concentration cannot be quantified due to deficiencies in data quality
NV = The analytical result was not validated
Notes:
NA = Not analyzed

Table 4. Decontamination Action Levels.

Analyte	MCL/MCLG (mg/L)[1/]	Decontamination Action Levels (mg/L)[2/]
CONTAMINANTS OF CONCERN		
Chromium	0.05	0.75
Nitrate	10	10
pH	-	6 to 9
OTHER INORGANICS[3/]		
Arsenic	0.05	0.75
Barium	1.0	1.0
Cadmium	0.01	0.15
Lead	0.05	0.75
Mercury	0.002	0.03
Nickel	0.1	1.0
Selenium	0.01	0.15
Silver	0.05	0.75

Notes:

1/ Maximum Contaminant Levels or Maximum Contaminant Level Goals as listed in 40 C.F.R. Parts 141 and 142, and O.A.C. 3745-81-11.

2/ pH range is not characteristic of corrosivity.

3/ Decontamination Action Levels were included for other inorganics pending complete characterization of the Tank Car Contents

Nitric Acid Tank Car and Area
Closure Certification

ATTACHMENT A: TELEPHONE CONVERSATION REPORT

TELCOMM REPORT

TO: D. McCormack Location: EED/Cincinnati

FROM: C. Slate Location: EED/Bellevue

SUBJECT: Decontamination Action Levels Set for Hazardous Constituents

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CONTACT: Randy Myers Location: OHIO EPA-Haz. Waste Div.
Technician (614) 644-2934

DATE: September 22, 1993 9:15 am

I asked Randy to summarize the ruling regarding the decontamination action level (3) in the *Closure Plan Review Guidance (OEPA 1991)* for a clearer understanding of the action level process. He explained that the levels are based on the MCL or MCLG of the particular contaminants associated with the waste being decontaminated. If there is not an MCL or MCLG for a particular constituent then a level below 1mg/l is the standard.

However, in the case of the Nitrate level (I quoted the 10 mgl level), his reply was that nitrates were not usually considered as a hazardous waste and that they (OEPA) would not be looking for that particular element. He did mention that the level seems high, but would not be a problem as far as the decontamination requirements are concerned. He emphasized that only contaminants associated with RCRA hazardous wastes are to be a factor in the action level plan. He said that not ALL MCLs or MCLG are necessarily to be considered when demonstrating decontamination action level requirements.

ATTACHMENT B: CLOSURE CERTIFICATIONS

The following pages are the FEMP closure certification statements (following the format in OAC 3745-50-42 (D)) and a Professional Engineer's (P. E.) certification statement documenting that HWMU No. 9, the Nitric Acid Tank Car and Area, was closed in accordance with the approved closure plan, as required under OAC 3745-66-15.

CERTIFICATION OF OWNER AND OPERATOR

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Jack R. Craig, Acting Director
U. S. Department of Energy, Fernald Office
Owner and Operator

10/31/94
Date Signed

CERTIFICATION OF CO-OPERATOR

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

James B. Williams for

Don Ofte, President
Fernald Environmental Restoration
Management Corporation, Co-Operator

10/11/94
Date Signed

CERTIFICATION OF INDEPENDENT REGISTERED PROFESSIONAL ENGINEER

Based on the information made available to me through review of field notes from and discussions with designated field representations, I, David G. Uetrecht, Jr., P.E. do hereby state that to the best of my knowledge and belief, Hazardous Waste Management Unit No. 9 (HWMU #9) at 7400 Willey Road, Fernald, Ohio has been closed in accordance with the Removal Action Work Plan and Closure Plan Information and Data (RAWP/CPID) for the Nitric Acid Tank Car and Area as approved by the Ohio Environmental Protection Agency (OEPA) on August 31, 1994, except for the deviations outlined below. These deviations are documented and resolved in the DOE Certification Report and the Final Report for the removal action (dated October 1993).

1. Deviations associated with closure of the HWMU are as follows:

   A. Tank car contents and liquid wastes from the project were transferred to the NAR System Tank F1-24 for disposal rather than into the UNH System and Tank 17 as specified in the plan. DOE justification for this action is stated in the closure certification report.

   B. "The RAWP/CPID established clean level (17.8 mg/kg) was changed to 16.3 mg/kg. This change corresponds with the FEMP established background mean plus two standard deviations; whereas, the 17.8 mg/kg corresponds to the Upper Tolerance Level. In addition, the TCLP Metals identified in the RAWP/CPID as constituents of concern (COCs) were not present in the nitric acid, with the exception of chromium. Therefore, the soil excavation was determined to be complete when verification soil samples revealed that chromium levels were below 16.3 mg/kg."

   C. The Decontamination Action Level (DAL) of 1 mg/L for nitrates as stated in the plan was exceeded. Nitrate concentrations were evaluated relative to a DAL of 10 mg/L as discussed with OEPA. The discussion is documented by Cynthia Slate in a September 22, 1993, Report of Telephone Communication with the Waste Division of OEPA in Columbus, Ohio.

2. Deviations associated with removal action activities are as follows:

   A. HWMU boundaries were not monumented as required by the plan. The area was surveyed and the coordinates for the HWMU corners are stated in the RAWP final report submitted by the Department of Energy (DOE).

   B. Gamma spectroscopy was not performed as indicated in the plan.

   C. Selenium results from all five (5) tank car content samples are qualified as unusable. The RAWP final report addresses this in Attachment A to the report.

David G. Uetrecht Jr.

David G. Uetrecht, Jr., P.E.
Ohio Registration No. E-047837
Adena Utilities Engineering, Inc.

10-10-94
Date

ATTACHMENT C: ENGINEER'S LOG BOOK

8/3/93 Spoke with Al Olding. Tony Snider will be sending a schedule of closures. Asked to do closure on Nitric Acid Tank Car.

8/10/93 Visited Pilot Plant Sump in AM. 5 techs. were dressed out with full face respirators. They wrapped pump and housing and layed yellow plastic sheeting on ground. Stopped back around 2:00 and spoke with Mike Daniels. Mike said nothing would happen until tomorrow morning. Spoke with Bob Giessl. He will be assisting in closures.

8/11/93 Met with Bob Giessl in AM. He accompanied me to the Pilot Plant Sump. We witnessed the tripple rinsing of the internal top 5" of the exit pipe. Tap water was used. Bob picked up flow and will monitor afternoon activities. See 5/11/93 notes from Bob Giessl.

8/25/93 Set up for lid removal. Area ropped off and crane in place. (NO_3 tank car).

8/26/93 NO_3 Tank Car -
10:00 Removed Lid
10 20 - 2:00 See notes per Robert Giessl

8/27/93 See Notes per Bob Giessl (CHNO$_3$, PPS,
8/30/93 Digging has been ongoing around the concrete encased pipe at the pilot plant sump.

010005
SD-EES-C09-CPI-10052

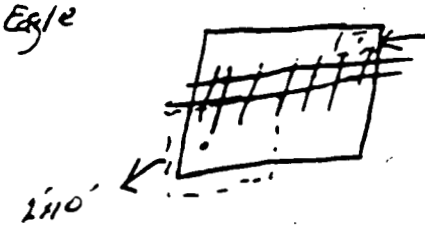
8-3-93

Steve Witters

ENV. EIIG. SDS DEPT
FEB 18 1 03 PM '94

9/7/93 Karen Ward, Jeff Eagle, Jerry Fry. meeting
John Lippot
Drummond H Fy Greensalt
Jerry Fry - Initial Wash, second half sept.
- Sampling Plan in progress
- Using a Kelly Scrubber, training has been completed.
- Nov. 22nd completion date
- D. I. water? Will it be needed

Tank Car Area (HNO_3) - Will excavate 2 areas and resample.
Jeff Eagle



Found Cr. background 17 mg/Kg
NE 20.4
SW 18.

Schedule → excavation and sampling 7/8/93

Pilot Plant Sump - Continuing removing soil and surface concrete.

Could not augur through or run camera into pipe.

9/8/93 10:30 NO_3 tank Car - HOWU area still ropped off. Sample points were marked with flags. NE and SW corners were individually contained in ropped of areas. This includes SP4 and SP5.

10:40 No activity. Still digging around--- concrete encased pipe, per Chris Warnert.

3:30 HNO_3 Tank Car - Visited site with Steve Bonior and Jeff Eagle. The two areas containing SP4 & SP5 were shoveled out to a 1½ to 2' depth. The soils and gravels were placed into 16 drums. Samples of SP4 and SP5 are to be taken.

9/13/93 Pilot Plant Sump - Work was continued on the concrete removal around the pipe connected to the sump. Respirators were worn instead of in-line air. I was informed that the pipe may be cut tomorrow

9/14/93 Pilot Plant Sump - Stopped by around 3:30. There was no visible sign of activities that had taken place during the day.

9/15/93 2:30 Stopped by Pilot Plant Sump. Spoke with Mike Daniels. They had pumped out sump today. Tomorrow they plan to rinse, sample, cut pipe, and remove the sump.

9/16/93 7:30 No Activity

2:15 Viewed sampling of the final rinse of the sump. Used a clear plastic colonosa for sample collection. His equipment - Inline air, full face, tyveks, N W. spoke with Mike Daniels and Mike Steff.

9/17/93 Pilot Plant Sump - AM, Mike Daniels said that the pipe will be cut after 12:00

2:00 Viewed the removal of the sump. The sump was lifted by crane and placed onto forklift within the HWMU.

9/18/93 HNO_3 Tank Car Meeting- Area of HWMU was expanded to a 40'x15'x12' area. The constituent of concern is Chromium.

- After the 12" removal of soils at Sp 4 and Sp 5 the analytical of the new surface was approximately 10ppm at each area. The background or level plus 2 standard deviations was changed from 17.8 to 16.3 ppm.

The level of the material in the tank car initially had a 1600 ppm Cr. Additional excavation with the HWMU is warranted. A final report is to be completed for the Dept. of Energy on Oct. 18, 1993. Additional Sampling of the tank car is warranted. Additional sampling is scheduled for Tuesday. The plan for disposition of the rail car is to cut a hole in ~~so~~ it so it is rendered useless and will not accumulate or hold materials. Currently waiting for Rinsate Samples.

11/30/93 Items needed for closure cert.

- Analytical Data - Tank Contents
  - Surrounding Soils
  - Tank Exterior, swipes
  - Any other data generated in support of this project
- Chain of custody forms for samples
- Paper trail on disposition of tank contents.
- Paper trail on disposition of all hazardous materials removed from HWMU
- Disposition of Holding Tanks, paper trail
- Correspondences, FERMCO - DOE
  FERMCO - EPA

10/1/93 11:00 NO_3 Tank Car
Visited HNO_3 HWMU. The RR
Was removed. West half of
excavation was done to a 1-2
foot depth. The excavated soils were
located in a dump truck. Drums
of previously excavated soils
were removed from area.
Sampling of excavated area
should commence on Monday.
The removed section of
railroad was placed on berm just
just north of the excavation.
HWMU roped off area was
expanded to accomodate the
heavy equipment. The HWMU
extends to the north fence and
encompasses RR storage.

10/18/93 11:00 meeting on closure of
HF storage area. Attendees -
John Lippert, Jerry Fry, Mike Grob,
Grace Hill, myself and Michael
Schley.

- Will be using a Kelly Scrubber
for cleaning of concrete. This
unit provides high pressure water
and brush scrubbing.

- They will first perform a test
run of the unit to gather background

6154

data. This will be done by scrubbing an area near the RCRA unit and collecting samples.

- The element of concern is Fl
- The field test will be performed until results vary less than 10%
- Three samples of the final rinse of the RCRA unit will be collected. An additional sample will be taken for field testing.
- Samples will also be taken of the water supply, equip. rinse blank.

10/22/43

9:30 HF Closure - Visited area in plant 4. Workers were setting up Kelly Scrubber. Jim Hill - just trying to familiarize with equipment today. Will begin job on Monday.

10/25/43 AM

HF Plant 4 Closure. Workers were still setting up equipment. Spoke with John Sexton, it looks like work in area won't be done till tomorrow. Call Jim Hill should have definite.

Notes from Professional Engineer Representative - Bob Giessl

August 26, 1993

10:20 am — Taped 1 liter teflon sampling cup to stainless steel bar (approx. eight feet long) to sample from top of the tank car. Discussed with Jim Hill that it appears the Nitric Acid Tank (NAT) Car has approx. 12 inches of liquid on the bottom which would be several hundred gallons - not approx. 100 gallons as first estimated.

10:35 am — Air monitored tanker head space at entrance. "Stick" lowered into NAT Car indicated approx. four inches of liquid. Sampled into two to four liter clear container. Samples are deep brown in color. Approx. 25 samples needed to fill the two to four liter container. Also sampled 0.5 to 1 liter container. Four to five samples were needed to fill the 0.5 to 1 liter container.

10:48 am — Sampling completed.

1:00 pm — Pumping contents began at approx. 12:40 pm. The pump is too small to pump over top to portable tank.

1:20 pm — Left jobsite.

2:00 pm — Returned to jobsite. No activity.

Robert P Giessl

Robert P. Giessl, 8-26-93

Notes from Professional Engineer Representative - Bob Giessl

August 27, 1993

8:00 am Workers are setting up the pump at the NAT Car jobsite.

8:55 am Work continues to prime the pump and prepare the pumping system.

9:10 am Work continues to prepare pumping system.

9:25 am Pumping begins. Approx. 30 gallons were metered into the pump to help start the pump.

9:26 am Pump stops functioning. Workers try to locate another pump.

Robert P Giessl

Robert P. Giessl, 8-27-93