

NEW SITE IDENTIFICATION (NSI)

Part A – NEW SITE IDENTIFICATION INFORMATION (To be completed by the Task Lead for New Site)	
1. Site Title: Buried Waste Pipe South of CFA-674 (Use known common names, location descriptors and or processes near or associated with the suspected inactive waste site.)	Site Code: CFA-54 NSI Evaluation Initiation Date: 11/26/03
2. Task Lead For New Site: Wendell Jolley	Phone: 526-5990
3. NSI Coordinator: Nielson Burch	Phone: 526-5676
4. Initiator or Initial Observer: Deborah Wagoner	Phone: 526-9989
5. Location of the Suspected New Site: (A location map and/or diagram identifying the site against controlled survey points or global positioning system descriptors may be included.) Site CFA-54 located at the Central Facilities Area (CFA) of the Idaho National Engineering and Environmental Laboratory (INEEL) consists of the buried 6 inch by 400 foot clay pipeline used to transfer waste from the Central Facilities Area Chemical Engineering Laboratory, Building CFA-674 to the CFA-04 mercury pond. The end of the pipe was exposed during remedial activities at Pond CFA-04. A decision was made, with Agency approval, to address the pipeline and residual material through the preparation of a NSI form. The pipe opening is located approximately 400 ft south-southeast of the south side of building CFA-674. Location coordinates for the end of the pipe are: NAD 27, Site Plane Coordinates North East and elevation NGVD 29 (ft) See attached map.	
6. Describe the observed conditions that indicate a suspect new site: A thin layer of dried sludge remains in the bottom of a pipe opening located during the remediation of Pond CFA-04. Sample analysis of the sludge revealed the presence of mercury at a concentration of 61 mg/kg. Samples taken from the soil directly beneath the pipe opening contained mercury at a concentration of 34 mg/kg. Additional sample data indicated no soil contamination beneath the pipe at a sample point 95 ft from the pipe opening towards the building (1-3 ft below the pipe). However, mercury was present at a concentration of 73 mg/kg in a sample 205 ft from the pipe opening towards the building (1-3 ft below the pipe). See the attached map with sampling data indicated.	

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Part B – SUSPECTED NEW SITE INVESTIGATION AND RECOMMENDATION
(To be completed by the Task Lead for New Site, except Block 3 which is to be completed by the Responsible Manager)

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1. Document all existing information including historical, process, screening data, analytical data, radiological surveys etc. (Attach supporting documentation)

Site CFA-54 consists of a buried 6 inch by 400 foot clay pipeline that was used to transport waste from the Chemical Engineering Laboratory building, CFA-674, to the mercury containment pond, CFA-04, from 1953 to 1969. Building CFA-674 was used to support activities associated with the development and testing of a nuclear waste calcining process on simulated (no fuel) nuclear fuel rods. The two primary waste streams discharged through the pipe included mercury-contaminated calcine and the liquid effluent from the laboratory's experiments.

The Comprehensive Remedial Investigation/Feasibility Study for the Central Facilities Area Operable Unit 4-13 at the Idaho National Engineering and Environmental Laboratory evaluated Pond CFA-04 and recommended excavation of the contaminated soil in the pond. Remedial action of Pond CFA-04 was conducted in 2003. The 6 inch clay pipeline was recognized and associated with Pond CFA-04, but was not officially added to the pond FFA/CO description. Consequently, remedial actions of Pond CFA-04 did not include any action for the pipe area. However, the opening of the pipe was unearthed during remedial activities and samples were collected and analyzed in conjunction with the Remedial Action sampling of the pond.

Sludge in the pipe and soil beneath the pipe were sampled prior to remedial actions for Pond CFA-04 to determine whether the average mercury concentration would exceed the final remediation goal of 8.4 mg mercury per kg of soil that was used for pond clean-up. The final remediation goal for Pond CFA-04 is a risk-based value that addresses both ecological and human health in a residential scenario. To assess the average mercury concentration in the area of the pipe, the assumption was made that the pipe leaked at each joint located at 6 foot intervals along the length of the pipe. Leakage was assumed to have spread laterally from pipe joints to 1.5 feet in both directions from the center line of the pipe and to 6 feet below the pipe. It was also assumed that minimal contamination was present in non-joint areas of the pipe. Contaminant concentrations from the non-joint sections of the pipe are discussed in the calculation below. Finally, the contamination within the pipe was included as discussed in the calculations below.

The calculation is described below and in the attached table (Table 1).

The estimated mass of mercury is determined for the following three potentially contaminated areas:

- 1) inside the pipe
- 2) a contaminated "plug" of soil beneath each joint along the pipe
- 3) the remainder of the soil beneath the pipe

The masses of mercury were summed and averaged across the total area of potentially contaminated soil. As shown in Table 1, the total volume of soil is considered to be 400 ft long by 3 ft wide by 10 ft deep or $3.4E+08$ cm³. Soil above the bottom of the pipe was assumed to be uncontaminated.

1. Inside the pipe:

Inside the pipe the dried sludge was assumed to be 0.25 in deep along the entire 400 ft length of pipe resulting in a total volume of $3.23E+04$ cm³ of sludge. The concentration of mercury in this volume of sludge is assumed to be the same as the concentration taken at the outlet of the pipe (61 mg/kg). As shown in Table 1 the total mass of mercury in the sludge was determined to be $2.96E+3$ mg.

2. Contaminated "plugs":

The bottom of the pipe was assumed to be at a depth of 4 ft for the entire 400 ft pipe length. It was also assumed that the pipe leaked at each joint (every 6 ft). The contaminated soil beneath each leak can be represented by a square 2 ft by 2 ft by 6 ft plug for a total of 67 plugs. The assumption was made that the soil contamination is most concentrated below the pipe and quickly tapers off such that 95% of the contamination from the leaks would be contained in the plugs. The soil directly below the pipe represents the area of greatest contamination. In summary, approximately 22% of the soil beneath the pipe contains 95% of the contamination. As shown in Table 1, the volume of soil was calculated to be $4.55E+07$ cm³. Using the average concentration of mercury in soil directly below the pipe (34 mg/kg) the mass of mercury within this volume was calculated to be $2.32 E+06$ mg.

3. The remainder of contaminated soil:

The remainder of the soil beneath the pipe was assumed to contain mercury concentrations of 5% of the 34 mg/kg concentration directly below the outlet of the pipe, or 1.7 mg/kg. As shown in Table 1, the volume of this soil was calculated to be $1.58E+08$ cm³ and the mass of mercury within this volume was calculated to be $4.02E+05$ mg.

Based on the assumptions and calculations above, the average mercury concentration in CFA-54 was calculated to be 5.36 mg/kg. This value is below the remediation goal of 8.4 mg/kg for Pond CFA-04. Consequently it is recommended that no action be taken at this site.

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1a. Is the site SWMU as defined in OSWER DIRECTIVE 9502.00-6? Yes No

2. Recommendation

- Recommend not including as a new FFA/CO site. This site DOES NOT warrant further investigation, does not meet the criteria for acceptance, and should not be included under FFA/CO Action Plan.
- Recommend including as new FFA/CO site. This site DOES meet the criteria for acceptance, may warrant further investigation, and should be included under FFA/CO Action Plan.

Recommended WAG and Operable Unit to which site should be assigned:

WAG: 10 Operable Unit: OU 10-08

Recommended further action for this site:

- No Action No Further Action Track 1 Track 2 RI/FS

4 Responsible Manager Certification: I have examined the information submitted in this document and believe the information to be true, accurate, and complete.

Name: Michael P. Hodel Signature: *Michael P. Hodel* Date: 5-6-04

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PART C – INEEL FFA/CO WAG MANAGERS CONCURRENCE

Site Title: _____

Site Code: _____

DOE-ID WAG Manager Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: _____ Date: _____

Explanation:

N/A

EPA WAG Manager Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: _____ Date: _____

Explanation:

N/A

State of Idaho WAG Manager Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: _____ Date: _____

Explanation:

N/A

NEW SITE IDENTIFICATION (NSI)

PART D - INEEL FFA/CO RESPONSIBLE PROGRAM MANAGERS (RPM'S) CONCURRENCE

Site Title: Buried Waste Pipe South of CFA-674	Site Code: CFA-54
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DOE-ID FFA/CO RPM Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: _____ Date: _____

Explanation:

EPA FFA/CO RPM Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: *Dennis F. [Signature]* Date: 8-5-04

Explanation:

EPA does not concur that this site warrants no action. Volumetric calculations using clean soil from above the pipe are not appropriate for this site. EPA recommends the pipeline be excavated and samples taken of the underlying soils to ascertain whether cleanup levels for mercury have been achieved.

State of Idaho FFA/CO RPM Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: _____ Date: _____

Explanation:

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PART D - INEEL FFA/CO RESPONSIBLE PROGRAM MANAGERS (RPM'S) CONCURRENCE	
Site Title: Buried Waste Pipe South of CFA-674	Site Code: CFA-54

DOE-ID FFA/CO RPM Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: Kathleen S Hair Date: _____

Explanation:

Concur with agency requests for additional characterization. A track 2 investigation will be completed 3/29/05

EPA FFA/CO RPM Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: _____ Date: _____

Explanation:

State of Idaho FFA/CO RPM Concurrence: Concur with recommendation. Do not concur with the recommendation.

Signature: Daryl E. Kah Date: 8/3/04

Explanation:

The State does not agree with the approach used in this New Site Identification Form to calculate the volume of mercury contaminated soil that may be present below the clay pipe. Combining the volume of clean soil that overlies the pipe with the estimated volume of contaminated soil that may be below the pipe joints reduces the concentration of the mercury in the resultant mass to less than the remediation goal. Separating the two volumes causes the estimated concentration in the soil below the pipe to exceed the remediation goal. Sampling data for soil below the pipe are limited to only four locations with a high value of 73 mg/kg. The concentration of mercury in the sludge was 61 mg/kg from one location. The State does not concur that this site can be considered a no action site. The State recommends carrying this site forward to a Track 2 with an appropriate sampling program.

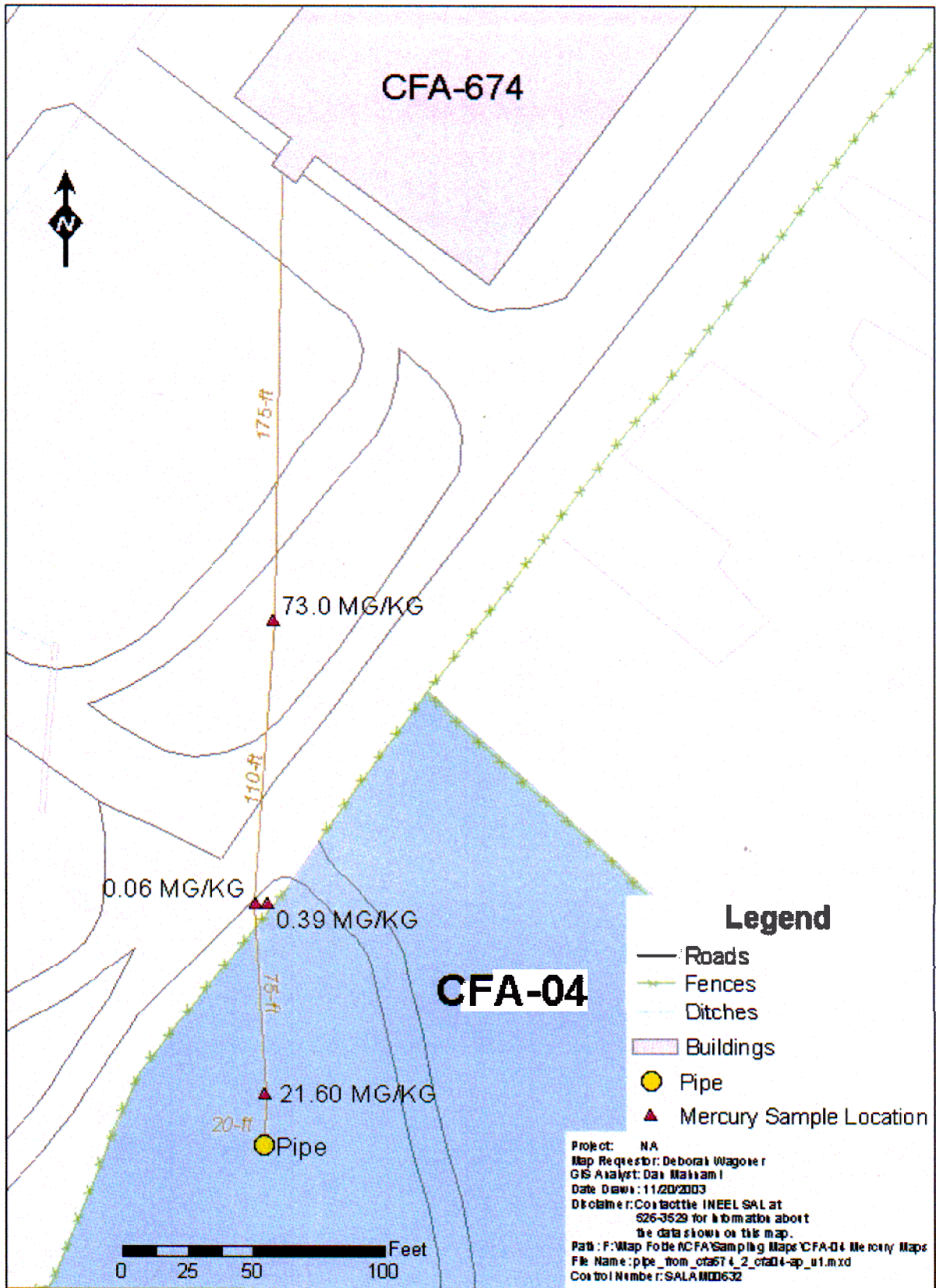


Table 1. Calculation of Mercury Concentrations in Soil around Buried Waste Pipe South of Building CFA-674

	Total volume to a 10 ft depth (cm ³)	Volume of clean soil (cm ³)	Volume of contaminated soil (cm ³)	Concentration of mercury in contaminated soil (mg/kg)	Mass of clean soil (kg)	Mass of contaminated soil (kg)	Mass of mercury (mg)	Average concentration of mercury in soil (mg/kg)
Area 15 (clean above pipe)	3.40E+08	1.36E+08	0.00E+00	0.00E+00	2.04E+05			
Area 15 (total below pipe)			2.03E+08					
Area 15 (95% contaminated)			4.55E+07	3.40E+01		6.83E+04	2.32E+06	
Area 15 (5% contaminated)			1.58E+08	1.70E+00		2.36E+05	4.02E+05	
Area 15 (in pipe)			3.23E+04	6.10E+01		4.85E+01	2.96E+03	
				Totals	2.04E+05	3.05E+05	2.73E+06	5.36E+00
Previous sampling was limited to 4 locations along the pipeline at 0-5 ft (21.6J, 039J, 73.0J, and 0.06E) and one at 2-4 ft (0.06 UJ).								
Calculation of mass of mercury at Area 15								
Total volume								
Length (cm)	1.22E+04		Assume 400ft or 12192 cm of pipe					
Width (cm)	9.14E+01		Assume spread from leaking pipe will be within 1.5 ft either side of center of the pipe (3 ft or 91.4 cm)					
Depth (cm)	3.05E+02		Assume 10 ft residential exposure					
Volume(cm ³)	3.40E+08							
Clean Soil above pipe								
Length (cm)	1.22E+04		Assume 400ft or 12192 cm of pipe					
Width (cm)	9.14E+01		Assume spread from leaking pipe will be within 1.5 ft either side of center of the pipe (3 ft or 91.4 cm)					
Depth (cm)	1.22E+02		Assume bottom of pipe is at 4 ft depth (4ft or 121.9 cm)					
Volume(cm ³)	1.36E+08							
In pipe								
Length (cm)	1.22E+04		Assume 400 ft or 12192 cm of pipe					
area (cm ²)	2.65E+00		Assume .25" of contamination in bottom of 6" pipe or .41 in ² or 2.65 cm ²				(calculated by subtracting the area of the triangle above the contamination within the pipe from the area of the pie within the pipe.)	
volume (cm ³)	3.23E+04							
Total soil below pipe								
Length (cm)	1.22E+04		Assume 400 ft or 12192 cm of pipe					
Width (cm)	9.10E+01		Assume spread from leaking pipe will be within 1.5 ft either side of center of the pipe (3 ft or 91.4 cm)					
Depth (cm)	1.83E+02		Assume bottom of pipe is at 4 ft depth and that 6 ft of soil are below (6ft or 183 cm)					
Volume(cm ³)	2.03E+08							
Contaminated below pipe								
			Assume that pipes leak at every joint, that there is a joint every 6 ft, and that the leak will be like a plug at each location					
			95% of the contamination will be within a 2 ft * 2 ft plug in the 4 to 10 ft depth.					
Volume(cm ³)	4.55E+07		In 400 ft there would be approximately 67 joints * 24 ft ² = 1608 ft ³					
			Therefore ~22% of the total soil below the pipe would contain 95% of the contamination					
			In the rest of the soil beneath the pipe, assume that the contaminate concentration is 5% of the maximum					
			It is assumed that the soil is most concentrated below the pipe and that it tapers off quickly from this point					
			1.7 is 5% of 34 mg/kg					
			This is based on a discussion with Kirk Dooley (assuming conservative assumptions on the amount of soil that would be contaminated by any leaks)					

GPS Location Information for Buried Waste Pipe Opening South of Building CFA-674

Surveyor: Dan Mahnami

Equipment: Trimble Pro XRS Mapping Grade (sub-meter) GPS unit

Function Check: Equipment was checked against GPS-1 at the CFA Fire Station and was within 0.234-ft after post-processing

Coordinate System: STATE PLANE, IDAHO EAST ZONE 1101, U.S. SURVEY FEET, HORIZONTAL DATUM NAD-27, VERTICAL DATUM NGVD-29

Comment	Easting	Northing	GPS Height	Max_PDOP	Rcvr_Type	GPS Date	GPS Time	Update_Status	Vert_Prec	Horz_Prec	Std_Dev
PIPE AT CFA-04 CERCLA Site			4925.908	1.8	Pro XRS	11/11/2003	01:42:56pm	New	0.5	0.3	0.215670
CORNER OF BUILDINGCFA-79			4932.991	1.9	Pro XRS	11/11/2003	01:45:03pm	New	0.5	0.3	0.271849