

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFA/CO) NEW SITE IDENTIFICATION (NSI)

Site Title: TSF Sewage Treatment Plant (TAN-623) and Sludge Dry Beds	Site Code: TSF-28 Document number: NSI-26009
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PART A

1. **Site Status:** Potential Existing

If a potential site, record the date entered into the Long Term Stewardship Tracking System:
(not applicable).

2. Description of Site and Location:

Site TSF-28 is an existing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) site within Test Area North (TAN), Operable Unit (OU) 1-10, consisting of the former Technical Support Facility (TSF) Sewage Treatment Plant (TAN-632) and the associated sludge drying beds. The sewage treatment facility was situated in the southwest portion of the TSF and served the TSF buildings at TAN (see Figure Part A-1). The facility was constructed in 1953, activated in 1954, and operated until it was deactivated in 2007. This new site investigation (NSI) form documents new information pertaining to this site as a result of decontamination and decommissioning (D&D) of the facility and subsequent sampling, and to identify whether conditions have changed sufficiently to warrant a change in the no further action determination (DOE-ID 1999).

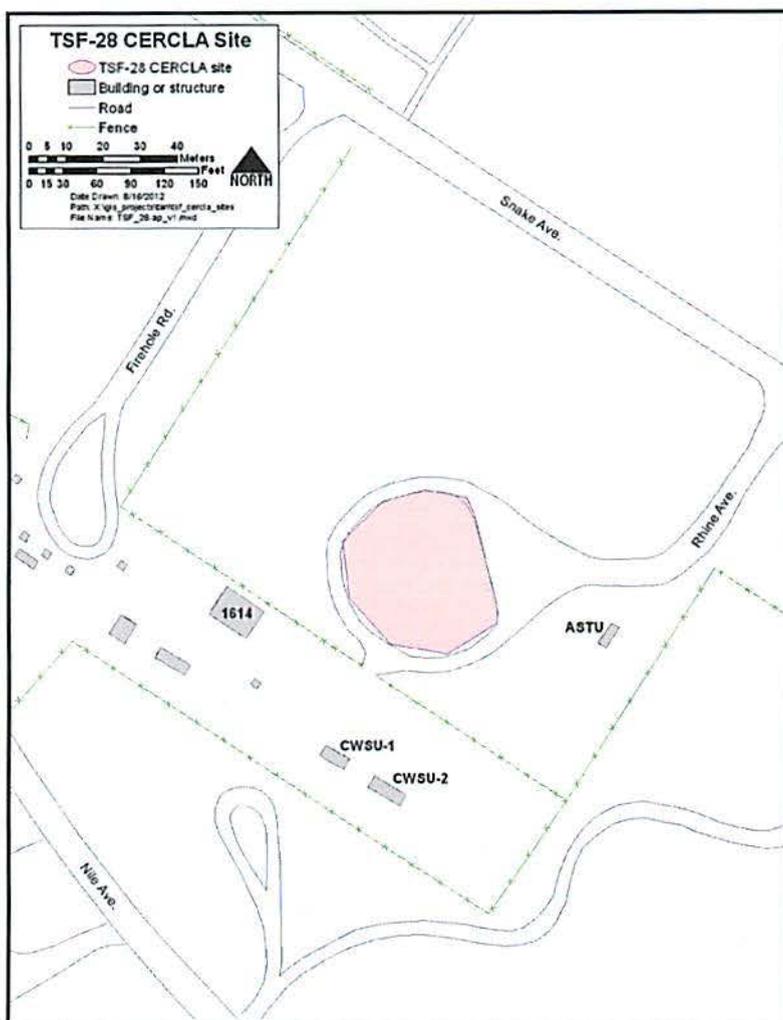


Figure Part A-1. Location of Site TSF-28, TSF Sewage Treatment Plant (TAN-623) and sludge dry beds.

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Samples collected in 1990 and 1992 were analyzed and reported in the *Preliminary Scoping Track 2 Summary Report for Operable Unit 1-08* (INEL 1994). According to the Track 2 Summary Report, the sewage treatment plant received small quantities of paint thinner and radioactive contamination. Detected concentrations of Co-60 and Cs-137 were found to pose an acceptable risk. Site TSF-28 was further examined during the OU 1-10 Comprehensive Remedial Investigation/Feasibility Study (DOE-ID 1997), was determined to require no further action, and did not require CERCLA remediation activities. Consequently, the *Final Record of Decision for Test Area North, Operable Unit 1-10* (DOE ID 1999) identified TSF-28 as a no further action site requiring institutional controls until the risk was determined to be less than or equal to 1E-04. Because the facility was still operational, the risk assessment was not performed at that time. In accordance with the OU 1-10 Record of Decision, additional sample data would be collected following closure of the facility to determine whether the no further action determination should be continued.

Following the completion of its operational lifetime, D&D of the sewage treatment facility was initiated in 2007 and completed in 2008. D&D actions consisted of removal of the sewage treatment facility control room and contact basin, to a depth of 3 ft below grade. The 18-ft deep Imhoff tank and the sludge drying beds, which consisted of sludge cake on top of a 1-ft thickness of sand and gravel on a concrete base, were completely removed (ICP 2009).

Soil samples were collected in 2007 prior to the initiation of D&D actions. But, unfortunately, sampling was not performed at the completion of D&D actions to determine whether contaminant concentrations had been removed to levels that would allow the institutional controls to be discontinued. Consequently, further evaluation of the site was necessary. Soil sampling was conducted in August 2011 to evaluate residual contaminant concentrations, and determine the need to continue institutional controls. Sampling was conducted in accordance with the requirements identified in the *Field Sampling Plan for TSF-28, and TSF-43 CERCLA Site Characterization* (DOE-ID 2011a). The sampling results are presented in the *Field Investigation and Risk Assessment Report for TSF-28 and TSF-43 CERCLA Site Characterization, Test Area North, Idaho National Laboratory* (DOE-ID 2011b). Part A of this document compares those data results against the Idaho National Laboratory (INL) Site background concentrations (INEL 1996) for constituents for which background concentrations are available. Part B provides additional data summary and risk-screening analysis.

Table Part A-1 presents screening of the 95% upper confidence limit (UCL) of the mean mercury concentration against the background concentration.

Table Part A-1. Background screening results for mercury in soil samples collected at TSF-43 in 2011.

Constituent	95% UCL of mean (mg/kg)	Background ^a (mg/kg)	Retain for further screening?
Mercury, elemental	3.53E-01	0.050	Yes
a. The value was obtained from Background Dose Equivalent Rates (INEL 1996). UCL upper confidence limit			

The 95% UCL of the mean mercury concentration is greater than the background concentration. Consequently, mercury was retained for additional screening in Part B of this NSI form.

Table Part A-2 presents screening of radionuclides against background concentrations. For constituents with sufficient detections to calculate the 95% UCL of the mean concentration, the UCL was screened against background concentrations (INEL 1996) when they were available. For all other constituents, the maximum detected concentration was used.

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Table Part A-2. Background screening of radionuclide concentrations in soil samples collected at Site TSF-43 in 2011.

Constituent	Maximum Concentration (pCi/g)	95% UCL of mean (pCi/g)	Background ^a (pCi/g)	Retain for further screening?
Am-241	ND	—	0.011	No
Cs-137	1.71E+01	7.05E+00	0.82	Yes
Co-60	2.75E-01	2.51E-01	NA	Yes
Eu-152	ND	—	NA	No
Eu-154	ND	—	NA	No
Eu-155	ND	—	NA	No
Sr-90 ^b	1.15E+00	—	0.49	Yes
U-233/234 ^b	1.30E+00	—	1.44	No
U-235/236	ND	—	NA	No
U-238 ^b	1.79E+00	—	1.40	Yes

Note: A dash within a cell means that data were insufficient to calculate the UCL.
 a. The values were obtained from Background Dose Equivalent Rates (INEL 1996).
 b. Because of insufficient detections, the 95% UCL could not be calculated.
 NA not applicable
 ND not detected
 UCL upper confidence limit

Because Am-241, Eu-152, Eu-154, Eu-155, and U-235/236 were not present at detectable concentrations, they are eliminated as a potential risk and will not be addressed further. Although the number of detections was not adequate to calculate a 95% UCL on the mean concentration for U-234/235, the maximum concentration is less than the background. Therefore, U-233/234 was eliminated as a potential risk and will not be addressed further. However, a background concentration is not available for Co-60; therefore, Co-60 was retained for further screening in Part B. In addition, Cs-137, Sr-90, and U-238 are present at concentrations greater than background concentrations (INEL 1996), and, therefore, also were retained for further screening in Part B. The data currently available are sufficient to evaluate whether institutional controls will remain necessary. Therefore, no additional samples are needed to complete Part B of this NSI form.

References

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code*, December 11, 1980.

DOE-ID 1997, *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory*, DOE/ID-10557, Rev. 0, U. S. Department of Energy Idaho Operations Office, November 1997.

DOE-ID, 1999, *Final Record of Decision for Test Area North Operable Unit 1-10*, DOE/ID-10682 Rev. 0, U.S. Department of Energy Idaho Operations Office, October 1999.

DOE-ID, 2011a, *Field Sampling Plan for TSF-28 and TSF-43 CERCLA Site Characterization*, TPMC 11-002, Rev. 1, Terranear PMC, LLC, July 2011.

DOE-ID, 2011b, *Field Investigation and Risk Assessment Report for TSF-28 and TSF-43 CERCLA Site Characterization, Test Area North, Idaho National Laboratory*, TPMC 11-008, Rev. 0, Terranear PMC, LLC, October 2011.

ICP, 2009, *Final Report for the Decontamination and Decommissioning of Test Area North (TAN)-607A/607, TAN-623, TAN-655, TAN-668, TAN-711, TAN-722, and TAN-799*, RPT-524, Rev. 0, Idaho Cleanup Project, November 2009.

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INEL, 1994, *Preliminary Scoping Track 2 Summary Report for Operable Unit 1-08*, INEL-94/0170, Lockheed Martin Idaho Technologies Company, September 1994.

INEL, 1996, *Executive Summary for Background Dose Equivalent Rates and Surficial Soil Metal and Radionuclide Concentrations for the Idaho National Engineering Laboratory*, INEL-94/0250 (Exec Sum), Rev. 1, Lockheed Martin Idaho Technologies Company, September 1996.

3. Is the site a solid waste management unit? Yes No

4a. Potential Site Recommendation

Do NOT include as a new FFA/CO site. This site does NOT warrant further investigation, and does NOT meet the criteria for acceptance (i.e., no evidence of a release of a CERCLA hazardous substance). The site should NOT be included under FFA/CO Action Plan.

Include as a new FFA/CO site. This site DOES meet the criteria for acceptance (i.e., evidence of a release of a CERCLA hazardous substance), DOES warrant further investigation, and SHOULD be included under the FFA/CO Action Plan (complete the remainder of Part A).

Additional sampling recommended?

- Yes – Submit Part A.
 No – Proceed to Part B.

4b. Existing Site Recommendation

Additional sampling recommended?

- Yes – Submit Part A.
 No – Proceed to Part B.

4c. Idaho Cleanup Project Environmental Restoration Director Concurrence:

Frank L. Webber
 Name (printed)


 Signature

12/18/2012
 Date

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11/06/2012
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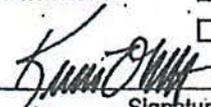
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PART A

5. FFA/CO Remedial Project Manager (RPM) Concurrence:

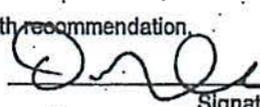
DOE-ID FFA/CO RPM: Concur with recommendation. Do not concur with recommendation.

EPA and DEQ concurrence required? Yes No

Kevin O'Neill Name (printed)  Signature 12/29/12 Date

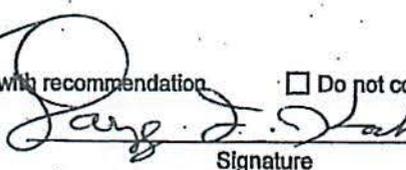
Explanation:

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

Dennis Faulk Name (printed)  Signature 1/17/13 Date

Explanation:

DEQ FFA/CO RPM concurrence: Concur with recommendation. Do not concur with recommendation.

Daryl F. Koch Name (printed)  Signature 1/19/2013 Date

Explanation:

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PART B

1. Data Analysis and Risk Assessment:

Because D&D activities in 2007 and 2008 included removal of the entire sewage treatment plant structure to 3 ft below grade and covering of the remains of the structure with 3 ft of clean fill, the 2011 samples were collected from the 3- to 5-ft-depth interval and the 8- to 10-ft-depth interval. The deeper samples were stored onsite pending the screening results of the samples collected from the shallower depth. If screening of the 3- to 5-ft-interval samples indicated the need to analyze the deeper samples to meet the criteria for closure under the residential land-use scenario (compliance with remediation goals to a depth of 10 ft below grade), the samples at the deeper intervals from the corresponding sample location(s) could be submitted for analysis of the constituent(s) in question.

Contaminants of concern identified in the *Field Sampling Plan for TSF-28 and TSF-43 CERCLA Site Characterization* (DOE-ID 2011a) included elemental mercury, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Am-241, U-234, U-235, U-238 (alpha spectrometry), and Sr-90. As identified in Part A, screening against the background concentrations eliminated Am-241, Eu-152, Eu-154, Eu-155, U-233/234 and U-235/236 as potential contaminants of concern.

Table Part B-1 presents screening of the 95% UCL of the mean mercury concentration against the background concentration.

Table Part B-1. Screening results for mercury in soil samples collected at TSF-28 in 2011.

Constituent	95% UCL of mean (mg/kg)	Residential Soil Cleanup level ^a (mg/kg)	Ecological Soil Screening Level ^a (mg/kg)	Contaminant poses an unacceptable risk human/eco?
Mercury, elemental	3.53E-01	4.3E+00	8.4E+00	No/No

a. The values were obtained from Table 6 of the *Operable Unit 10-08 Remedial Design/Remedial Action Work Plan* (DOE-ID 2010).
 UCL upper confidence limit

The 95% UCL of the mean mercury concentration is less than the residential soil cleanup level and the ecological and human health screening level. Therefore, mercury is eliminated as an unacceptable risk.

Table Part B-2 presents screening of radionuclides based on the 95% UCL of the mean concentration, screened against residential soil cleanup levels and ecological screening levels. For constituents for which detections were sufficient to calculate the 95% UCL of the mean concentration, the UCL was screened against residential cleanup levels and ecological soil screening levels. For all other constituents, the maximum detected concentration was used.

Table Part B-2. Screening of radionuclide concentrations in soil samples collected at TSF-28 in 2011.

Constituent	Maximum Concentration (pCi/g)	95% UCL of mean (pCi/g)	Residential Soil Cleanup level ^a (pCi/g)	Ecological Soil Screening Level ^a (pCi/g)	Contaminant poses an unacceptable risk human/eco?
Cs-137	1.71E+01	7.05E+00	6.0E+00	4.95E+03	Yes/No
Co-60	2.75E-01	2.51E-01	3.61E+00	1.18E+03	No/No
Sr-90 ^b	1.15E+00	—	2.31E+01	3.34E+03	No/No
U-238 ^b	1.79E+00	—	7.42E+01	2.32E+01	No/No

Note: A dash within a cell means that data were insufficient to calculate the UCL.
 a. The values were obtained from Table 6 of the *Operable Unit 10-08 Remedial Design/Remedial Action Work Plan* (DOE-ID 2010).
 b. Because of insufficient detections, the 95% UCL could not be calculated.
 UCL upper confidence limit

Table Part B-2 shows that the 95% UCL for Cs-137 exceeds the residential soil cleanup level, but is below the ecological soil screening level. All other constituent concentrations were below both the ecological screening level and residential soil cleanup level.

At the time of the initial screening by Terranear PMC, LLC (DOE ID-2011b), the 95% UCL for Cs-137 was mistakenly

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screened against a residential soil cleanup level as calculated for 2011, instead of the 2095 value. As a result, the 95% UCL was determined to be less than the residential soil cleanup level, and the samples from the 8- to 10-ft-depth interval were not analyzed, and were discarded onsite. Because of the high K_d of Cs-137, and because the waste water was discharged near ground surface, the highest concentrations are expected at the shallowest depth. Therefore, it is likely that the sample results from the shallow depth interval would have been below the residential soil cleanup level. However, institutional controls would have been retained based on the results of the shallower samples and the outcome would not have changed.

As identified in Table 7 of the *Operable Unit 10-08 Remedial Design Remedial Action Work Plan* (DOE-ID 2010), Sr-90 is the only groundwater contaminant of potential concern. However, no driving force exists to accelerate migration to the Snake River Plain Aquifer; therefore, Sr-90 is eliminated as a potential risk to the groundwater.

Based on the results of this risk screening, Cs-137 is the only contaminant present at concentrations that pose an unacceptable potential risk to human health or the environment. Because the 95% UCL for Cs-137 exceeds the residential soil cleanup level, institutional controls will be required at the site until the Cs-137 concentration decays to below the residential soil cleanup level of 6.0 pCi/g. The termination date for ICs at TSF-28 was calculated using the formula below.

$$t = (1/\lambda)\ln(C_f/C_0)$$

Where

t = Decay time (in years) required for Cs-137 to decay to residential soil cleanup level

λ = Cs-137 decay rate constant (0.023 yr⁻¹)

C_f = Final Cs-137 concentration (residential soil cleanup level = 6.0 pCi/g)

C_0 = Initial Cs-137 concentration (95% UCL from 2011 sampling = 7.05 pCi/g).

Results of the above equation indicate that institutional controls will be required for 7 years from the time samples were collected (August 2011), or until August 2018. Therefore, it is recommended that Site TSF-28 remain a no further action site requiring institutional controls as identified in the OU 1-10 Record of Decision (DOE-ID 1999).

References

DOE-ID, 1999, *Final Record of Decision for Test Area North, Operable Unit 1-10*, DOE/ID-10682, Rev. 0, U.S. Department of Energy, October 1999.

DOE-ID 2010, *Operable Unit 10-08 Remedial Design/Remedial Action Work Plan*, DOE/ID-11418, Rev. 0, U.S. Department of Energy Idaho Operations Office, August 2010.

DOE-ID, 2011, *Field Sampling Plan for TSF-28 and TSF-43 CERCLA Site Characterization*. TPMC 11-002, Rev. 1, Terranear PMC, LLC, July 2011.

DOE-ID, 2011b, *Field Investigation and Risk Assessment Report for TSF-28 and TSF-43 CERCLA Site Characterization, Test Area North, Idaho National Laboratory*, TPMC 11-008, Rev. 0, Terranear PMC, LLC, October 2011.

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PART B

4. FFA/CO Remedial Project Manager (RPM) Concurrence:

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

Kevin O'Neill *Kevin O'Neill* 12/27/12
Name (printed) Signature Date

Explanation:

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

Dennis Zwick *Dennis Zwick* 1/14/13
Name (printed) Signature Date

Explanation:

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

Daryl F. Koch *Daryl F. Koch* 1/15/2013
Name (printed) Signature Date

Explanation: