



DOE/ID-10658
Revision 3
March 2000

U.S. Department of Energy
Idaho Operations Office

Operations and Maintenance Plan for the Final Selected Remedies and Institutional Controls at Test Reactor Area, Operable Unit 2-13



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Published March 2000

**Prepared for
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Operations Office
Contract DE-AC07-99ID13727**

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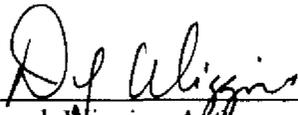
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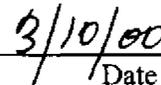
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Date

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PREFACE NOTE

Revision 0 of this Operations and Maintenance Plan for the Final Selected Remedies and Institutional Controls at Test Reactor Area, Operable Unit 2-13 was included in the Comprehensive Remedial Design/Remedial Action Work Plan for Test Reactor Area, Operable Unit 2-13 Package (DOE/ID-10643, Revision 0, 1998).

Revisions 1 (December 1999) and 2 (January 2000) were Draft Revisions of this document to incorporate Agency comments regarding Revision 0. These Agency comments on Revisions 1 and 2 have been incorporated into this document as Revision 3.

ABSTRACT

This is the plan for the long-term (at least 100 years) operations and maintenance of the final selected remedy for the Warm Waste Pond 1952, 1957 and 1964 cells (TRA-03), Chemical Waste Pond (TRA-06), Sewage Leach Pond (TRA-13), Sewage Leach Pond Soil Contamination Area, Soil Surrounding Hot Waste Tanks at Building 613 (TRA-15), Soil Surrounding Tanks 1 and 2 and Building 630 (TRA-19), and Brass Cap Area. This document also includes the plans for operation and maintenance of the institutional controls that preserve the underlying assumptions for seven of the no action sites and one remediated site (Cold Waste Pond). The December 1997 Final Record of Decision for Waste Area Group 2, Operable Unit 2-13 contains the requirements for this plan.

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ACRONYMS

AEA	Atomic Energy Act
ALARA	as low as reasonably achievable
BCA	Brass Cap Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFLUP	Comprehensive Facilities and Land Use Plan
COC	contaminant of concern
CP	Chemical Waste Pond
CWP	Cold Waste Pond
CX	categorical exclusion
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DOI	U.S. Department of Interior
EA	environmental assessment
EIS	Environmental Impact Statement
EM	Environmental Management
EPA	U.S. Environmental Protection Agency
ERIS	Environmental Restoration Information Repository
FRG	final remediation goal
FY	fiscal year
GPRS	global positioning radiometric scanner
GSA	General Services Administration
HQ	hazard quotient
IC	institutional controls

IDHW/IDEQ	Idaho Department of Health and Welfare/State of Idaho Division of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
MCL	maximum contaminant level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priorities List
O&M	operation and maintenance
OU	operable unit
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SCA	Soil Contamination Area
SLP	Sewage Leach Pond
TRA	Test Reactor Area
USGS	United States Geological Survey
WAG	waste area group
WWP	Warm Waste Pond

Operations and Maintenance Plan for the Final Selected Remedies and Institutional Controls at Test Reactor Area, Operable Unit 2-13

1. INTRODUCTION/PURPOSE

This site specific operation and maintenance (O&M) plan describes the activities and procedures required to:

1. Inspect and maintain the native-soil and engineered covers at the Warm Waste Pond (WWP), Chemical Waste Pond (CP), and Sewage Leach Pond (SLP)
2. Inspect and maintain institutional controls as part of the remedy at the WWP, CP, SLP, and Soil Contamination Area (SCA), Soil Surrounding Hot Waste Tanks at Building Test Reactor Area (TRA)-613 (TRA-15), Soil Surrounding Tanks 1 and 2 at Building TRA-630 (TRA-19), and Brass Cap Area (BCA) located at the TRA.
3. Inspect and maintain institutional controls to preserve underlying assumptions in the remedial investigation/feasibility study (RI/FS) for the Cold Waste Pond (CWP), the spills at TRA-619, TRA-626, and TRA-653, the Warm-Waste Retention Basin, TRA North Storage Area, the Hot Tree Site, and the Groundwater/Perched Water.

Groundwater monitoring will not be included in this O&M plan. It will be performed in accordance with the Operable Unit (OU) 2-13 groundwater monitoring plan (U.S. Department of Energy Idaho Operations Office [DOE-ID] 1998a).

Implementation of institutional controls, inspection, maintenance, reporting, and record keeping comprise the scope of anticipated activities. Basic elements of this O&M plan are as follows:

- A description of institutional controls and how they will be institutionalized
- A description of procedures for inspection of the natural soil and engineered covers and institutional controls, including radiological surveys to assess the effectiveness of the remedial action for select sites
- Maintenance procedures for the natural-soil and engineered covers, reseeded areas, and institutional controls
- Reporting policies and practices
- Record keeping policies and practices.

2. BACKGROUND

2.1 INEEL/TRA Background

The Idaho National Engineering and Environmental Laboratory (INEEL) is a government-owned/contractor operated facility managed by the DOE-ID (Figure 2-1) that is located 51 km (32 mi) west of Idaho Falls, Idaho. The INEEL encompasses portions of five Idaho counties: (1) Butte, (2) Jefferson, (3) Bonneville, (4) Clark, and (5) Bingham, occupying 2,305 km² (890 mi²) of the northeastern portion of the Eastern Snake River Plain. The TRA was established in the early 1950s in the southwestern portion of the INEEL. The TRA has housed extensive facilities for studying the effects of radiation on materials, fuels, and equipment, including high neutron flux nuclear test reactors. Radioactive, unregulated, and Resource Conservation and Recovery Act (RCRA) hazardous wastes have been generated from scientific and engineering research projects conducted at TRA. Although extracted and treated, the disposed wastes still contained low-level radioactive and RCRA-hazardous solutions. As originally designed and installed in the early 1950s, two separate liquid waste streams were generated and discharged at TRA: (1) sanitary sewage and (2) all other liquid waste streams.

As part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 6901 et seq.) process, a Record of Decision (ROD) was signed for the TRA with regards to remaining contamination from these waste streams (DOE-ID 1997a). This ROD presents the selected remedies for 55 sites evaluated under the Waste Area Group (WAG) 2 comprehensive RI/FS (DOE-ID 1997b). Of these 55 sites, the ROD provides information to support remedial actions for eight sites where contamination presents an unacceptable risk to human health and the environment. Remedial action was performed at four of these sites. An engineered or native cover was placed over three of the four sites: The Warm Waste Pond Cells (TRA-03), the Chemical Waste Pond (TRA-06), and the Sewage Leach Pond (TRA-13). Follow-on institutional controls are required on these covers. In addition, the remediated Cold Waste Pond (TRA-08) requires institutional controls to preserve the underlying RI/FS assumption of industrial land use only for 100 years since there is contamination remaining that would not allow for current free and unlimited use, but would allow for unlimited residential use in 100 years. A limited action remedy was selected for the Soil Surrounding Hot Waste Tanks at building TRA-613 (TRA-15) and for the SLP Soil Contamination Area. Limited action with implementation of a contingent excavation and disposal option was selected as the remedy for the other two of the eight sites: the soil surrounding Tanks 1 and 2 at Building TRA-630 (TRA-19), and the Brass Cap Area. Some additional institutional controls for contamination at depths greater than 3 m (10 ft) are also required for TRA-15.

The ROD identified the remaining 47 No Action sites as not posing unacceptable risks. In the case of seven of these sites, that determination was based on the assumptions regarding land use or exposure routes in the risk scenarios evaluated. The ROD states that for those sites where no action will be taken, based on land use assumptions, those assumptions will be reviewed as part of the 5-year review. Therefore, these seven sites also require institutional controls to preserve the underlying assumptions of the RI/FS and ROD. These sites are polychlorinated biphenyl (PCB) spills at TRA-619, 626, and 653; the TRA Warm-Waste Retention Basin (TRA-712) to control sediments below 10 feet; the TRA North Storage Area; the Hot Tree Site; and the Snake River Plain Aquifer/Perched Water System. Inclusion of institutional controls for these sites is consistent with U.S. Environmental Protection Agency (EPA) Region 10 Policy on the Use of Institutional Controls at Federal Facilities (May 1999) and with the requirement under CERCLA that when waste is left in place above levels that allow for unlimited use, appropriate controls must be in place to limit exposure and achieve acceptable levels of risk.

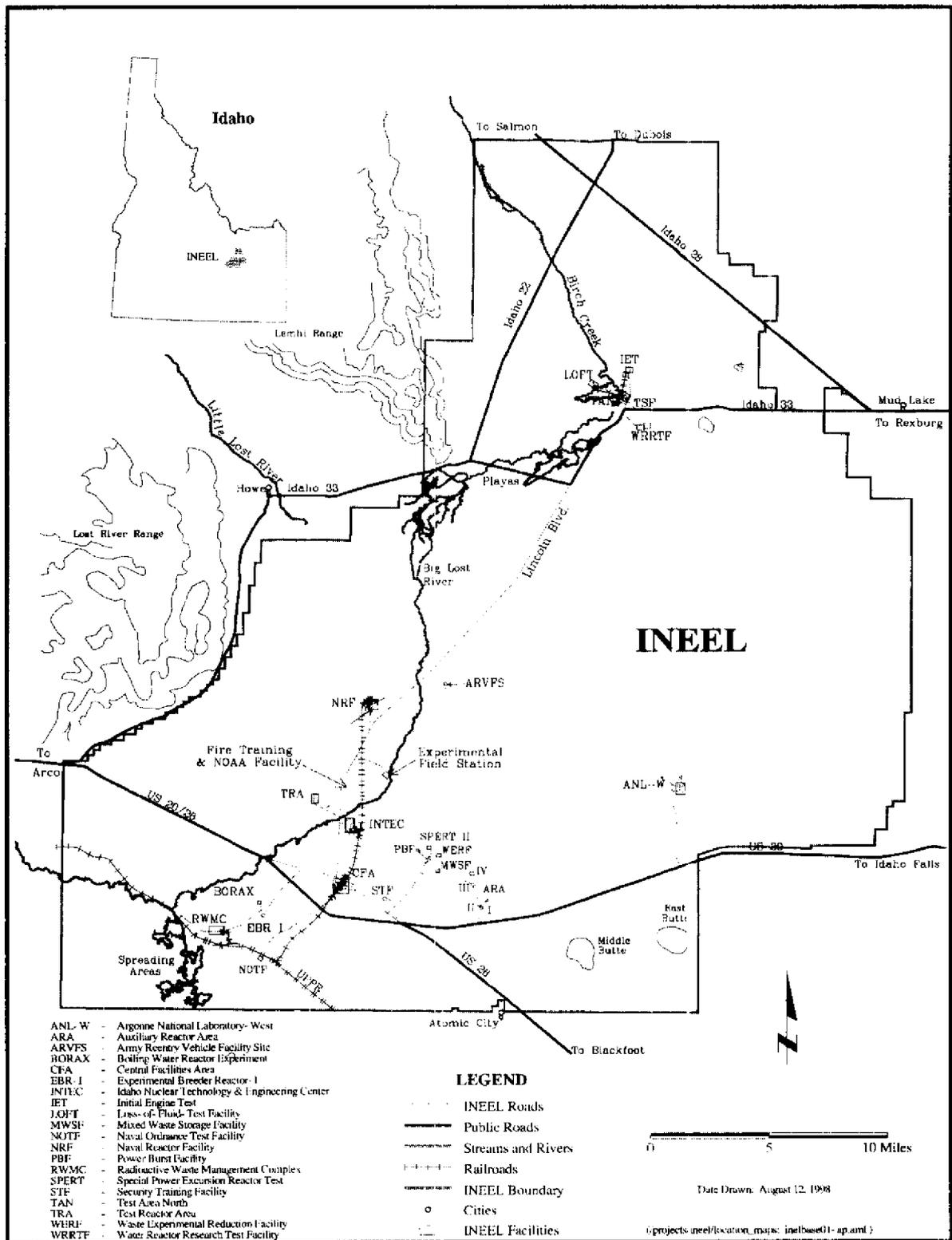


Figure 2-1. Map of the INEEL.

2.2 INEEL Comprehensive Facility and Land Use Plan

The *INEEL Comprehensive Facility and Land Use Plan* (DOE-ID 1997c) is the overall document that documents and displays current and anticipated future land use and facility use at the INEEL. The *INEEL Comprehensive Facility and Land Use Plan* provides guidance on facility and land use at the INEEL through the 100 year scenario. The *INEEL Comprehensive Facility and Land Use Plan* is updated, as needed, when information such as land use changes, and includes specific land use information about the TRA facility.

The *INEEL Comprehensive Facility and Land Use Plan* was developed with stakeholder participation. The original draft of the *INEEL Comprehensive Facility and Land Use Plan* was distributed, and public and Tribal input was included in the development of the original edition of this plan. Facility and land use planners gathered information and plans for the future use of INEEL facilities and land. A published draft plan was then produced and made available for internal INEEL review and public review and comment through distribution to the Shoshone-Bannock Tribes, presentation to the Citizen's Advisory Board (composed of individuals representing many public entities, including chambers of commerce, local Tribes, environmental groups, local government, organized labor, and others), placement in regional libraries and reading rooms, and advertisements in the print media. Upon completion of that review and comment period, comments were considered and incorporated, as appropriate, in the final version of the plan.

Land use projections in the INEEL Comprehensive Facility Land Use Plan incorporate the assumption that the INEEL will remain under government management and control for at least the next 100 years. A mix of land uses across the INEEL is anticipated to include unrestricted industrial uses, government-controlled industrial uses, unrestricted areas, controlled areas for wildlife management and conservation, and waste management areas. No residential development will be allowed within INEEL boundaries and no new major private developments (residential or nonresidential) on public lands are expected in areas adjacent to the Site. Grazing will be allowed to continue in the buffer area.

2.3 WAG 2 OU 2-13 Waste Site Locations

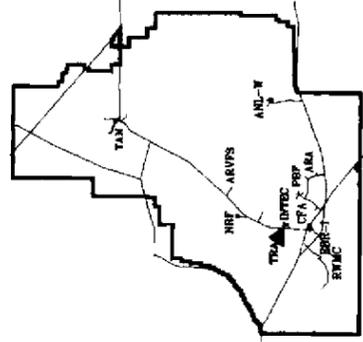
A map of the sites that were remediated and the sites needing institutional controls is included in Figure 2-2. Maps of each site and its surveyed coordinates are included in Figures 2-3 through 2-15.

Test Reactor Area (TRA) With CERCLA Sites

LEGEND

- Roads and Buildings
- - - Tanks
- - - Fences
- CERCLA Sites

Operable Unit	Site Code	Action	Description
2-04	TRA-019	Track 2	PCB Spill
2-13	TRA-06	Track 1	Chemical Waste Pond (TRA-701)
2-09	TRA-13	Track 2	Sewage Leach Ponds
2-04	TRA-08	Track 2	PCB Spills
2-04	TRA-08	Track 2	PCB Spills
2-04	TRA-15	Track 2	Hot Waste Tanks #1 and #2 (TRA-630)
2-04	TRA-15	Track 2	Hot Waste Tanks #3, #4, and #5 (TRA-713)
2-01	TRA-04	Comp. RUPFS	Warm Waste Retention Basin Surface Sediments
2-04	TRA-653	Track 2	PCB Spill, Metal Contamination
2-10	TRA-03	RUPFS	Warm Waste Ponds
2-09	TRA-08	Track 2	Cold Waste Disposal Pond
2-04	TRA-34	RUPFS	North Storage Area
2-13	TRA-Y	RUPFS	Brass Cap Area
2-13	TRA-X	RUPFS	Hot Tree Site



Vicinity Map



0 200 400 600 800 1000 Feet

Date Drawn: March 09, 2000

INTELL SPATIAL ANALYSIS LABORATORY
ADVANCING TECHNOLOGY TO MEET ENVIRONMENTAL NEEDS

(projects/cercla_sites/tra_specific_cercla_1999-hi_v3)

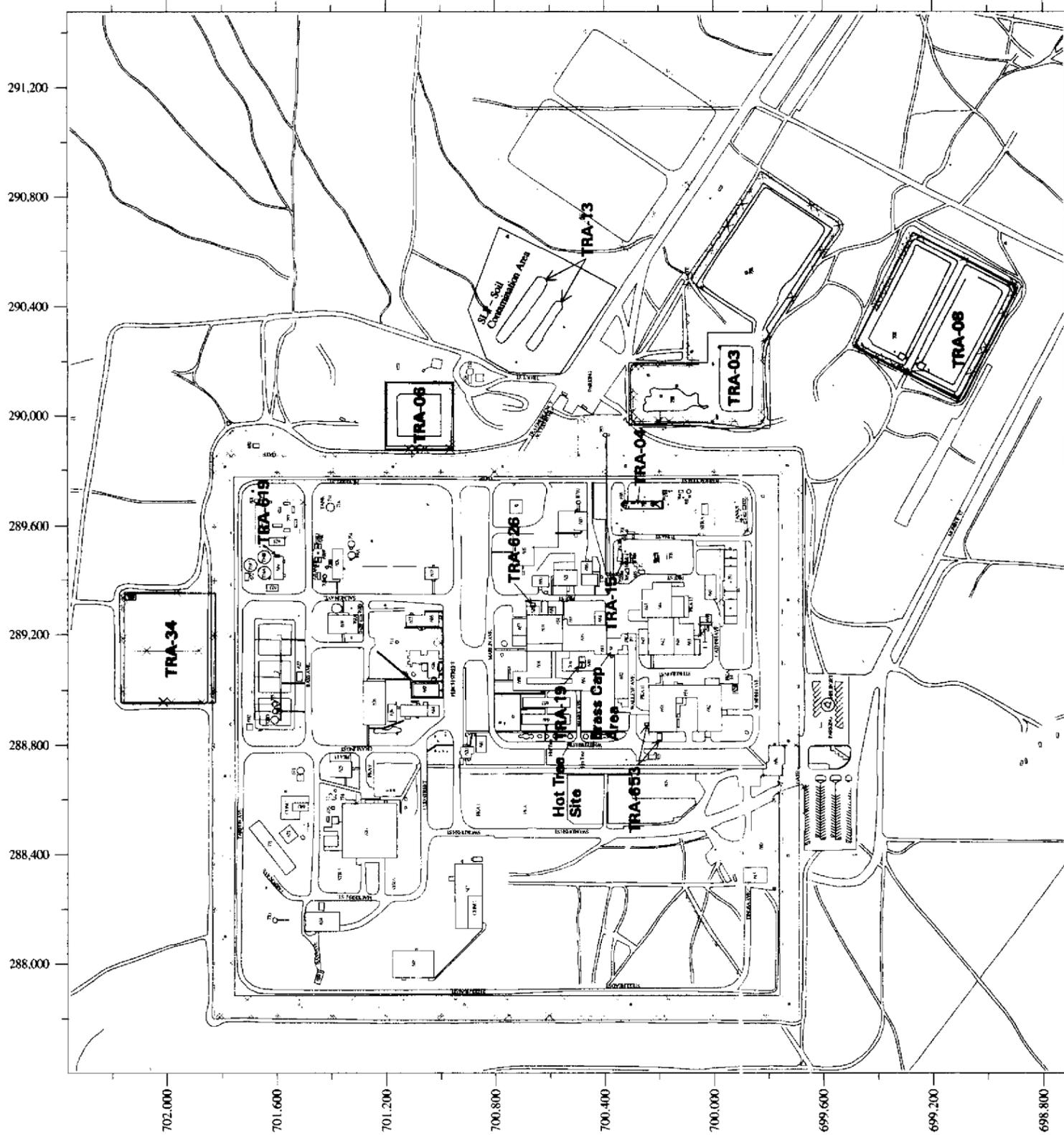


Figure 2-2. Map of TRA with retained CERCLA sites.

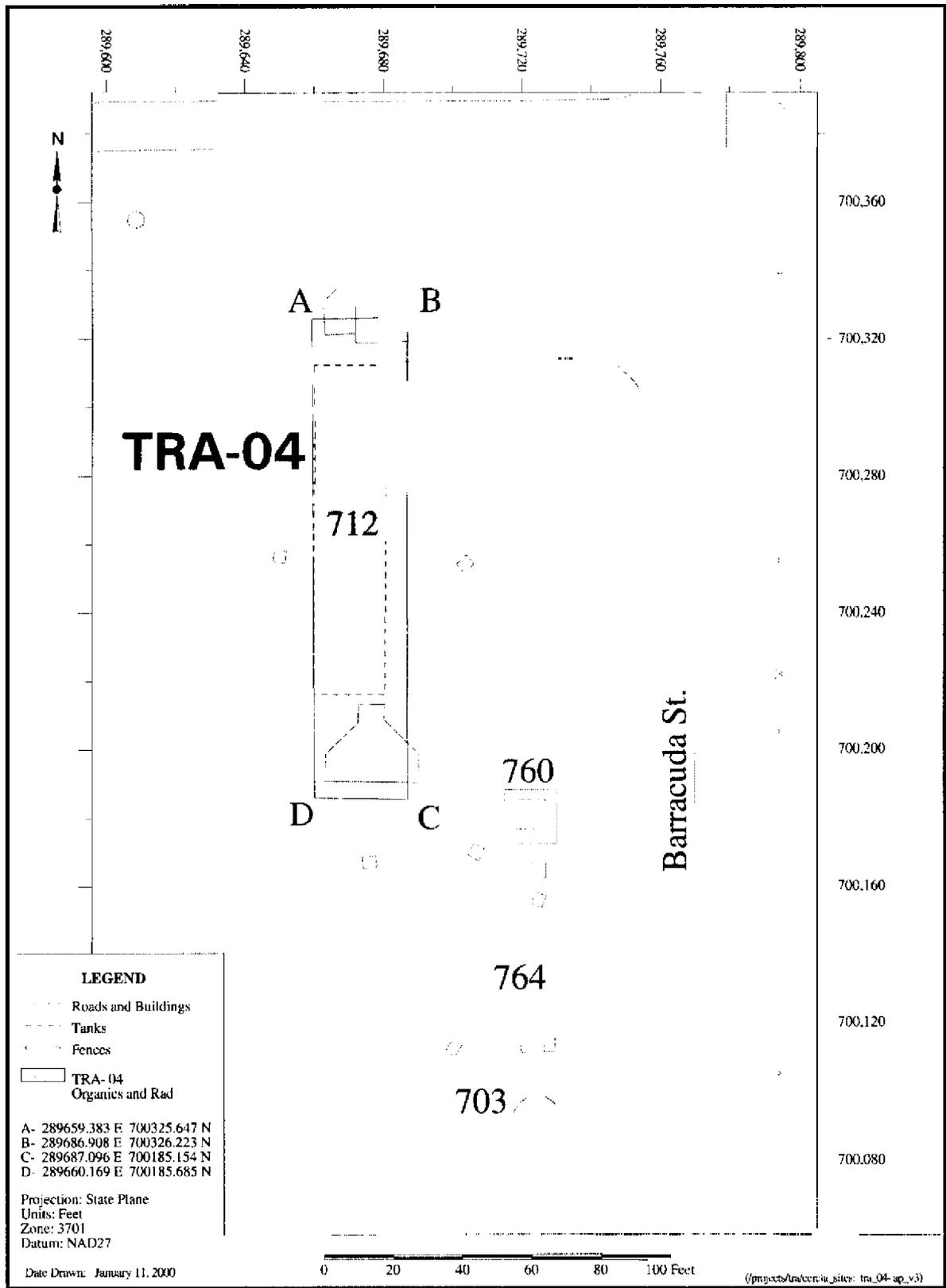


Figure 2-4. Map of TRA-06, Chemical Waste Pond.

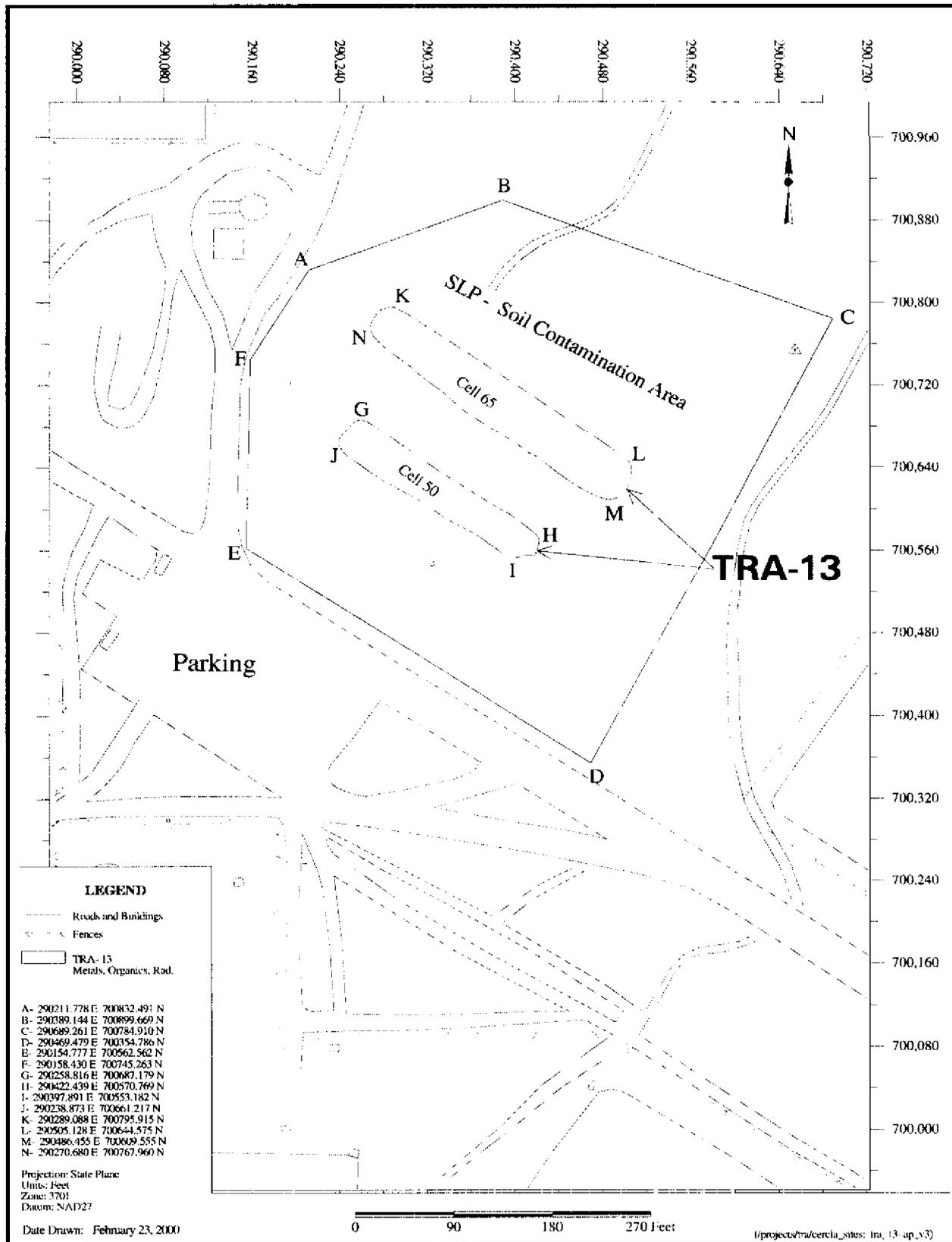


Figure 2-5. Map of TRA-13, Sewage Leach Pond and Soil Contamination Area.

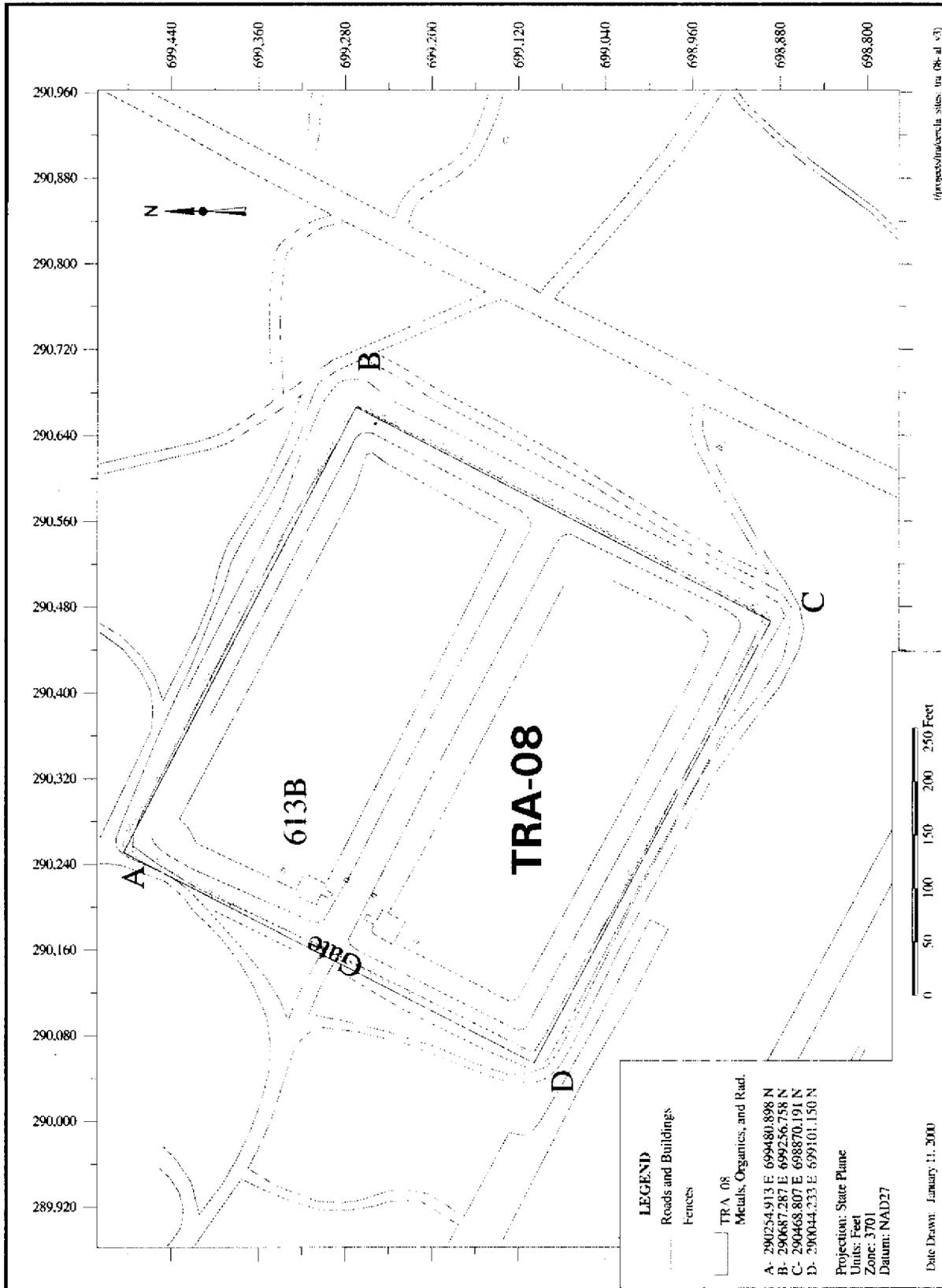


Figure 2-6. Map of TRA-08, Cold Waste Disposal Pond.

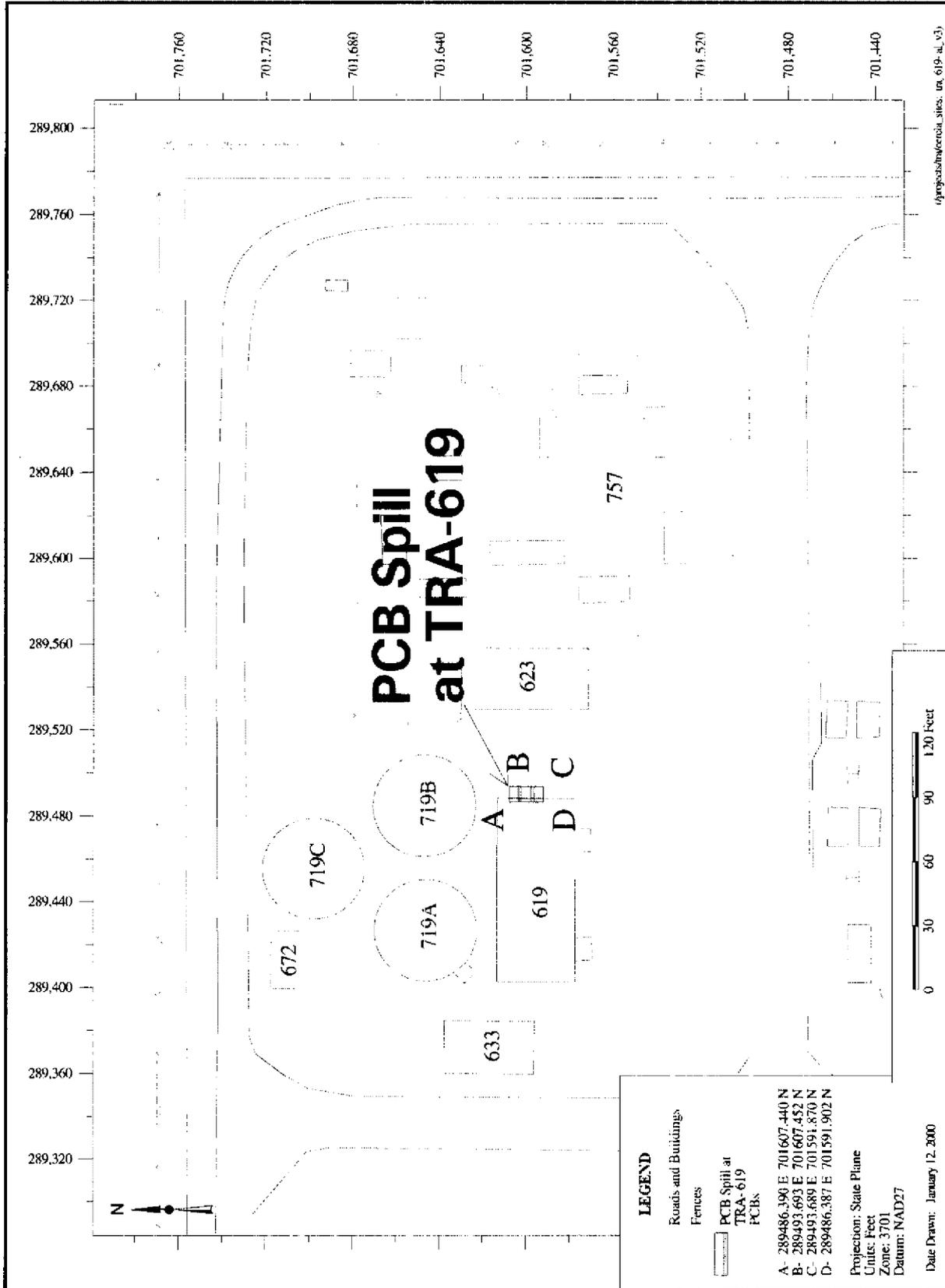


Figure 2-7. Map of TRA-619, PCB Spill.

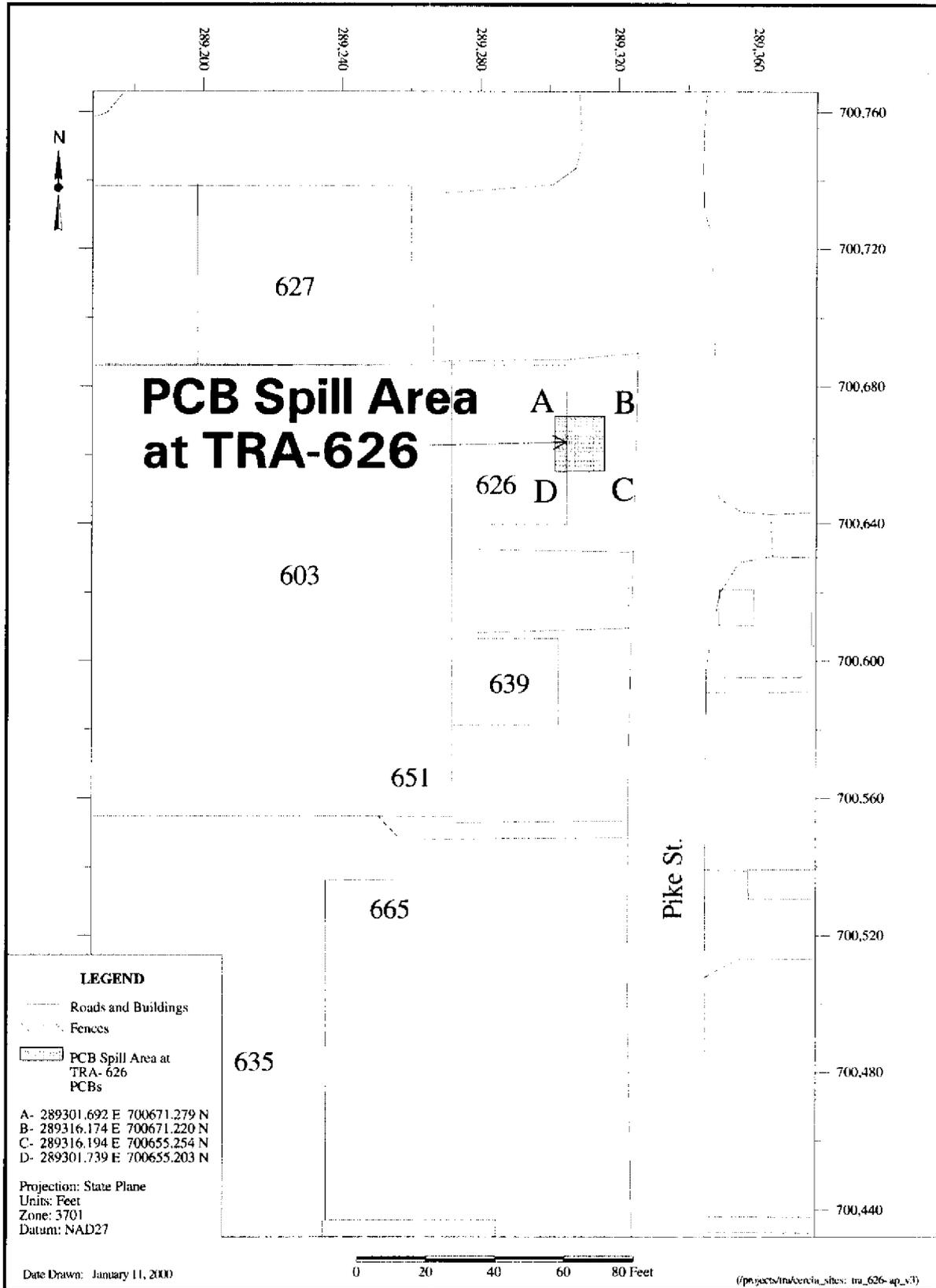


Figure 2-8. Map of TRA-626, PCB Spill.

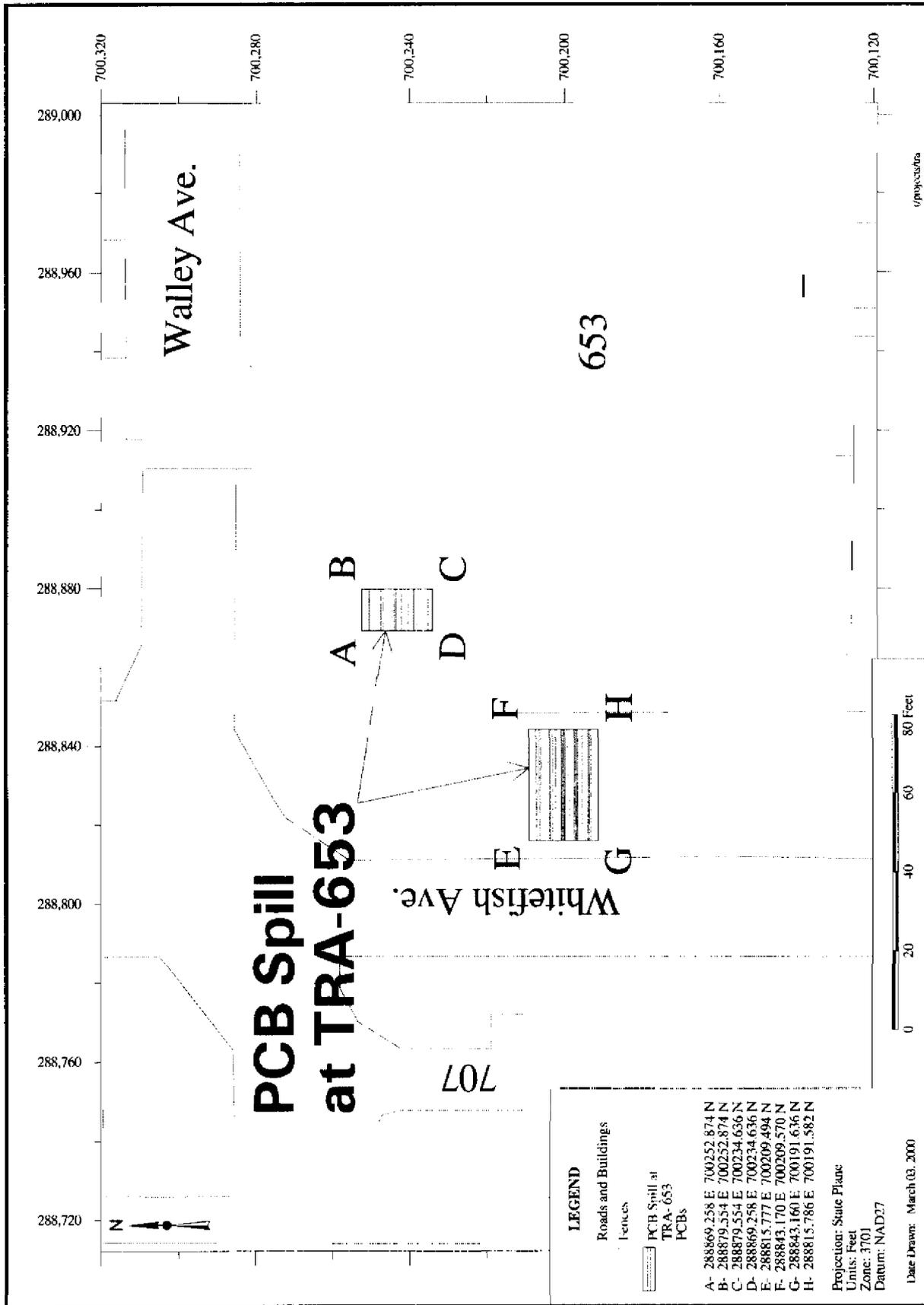


Figure 2-9. Map of TRA-653, PCB Spill.

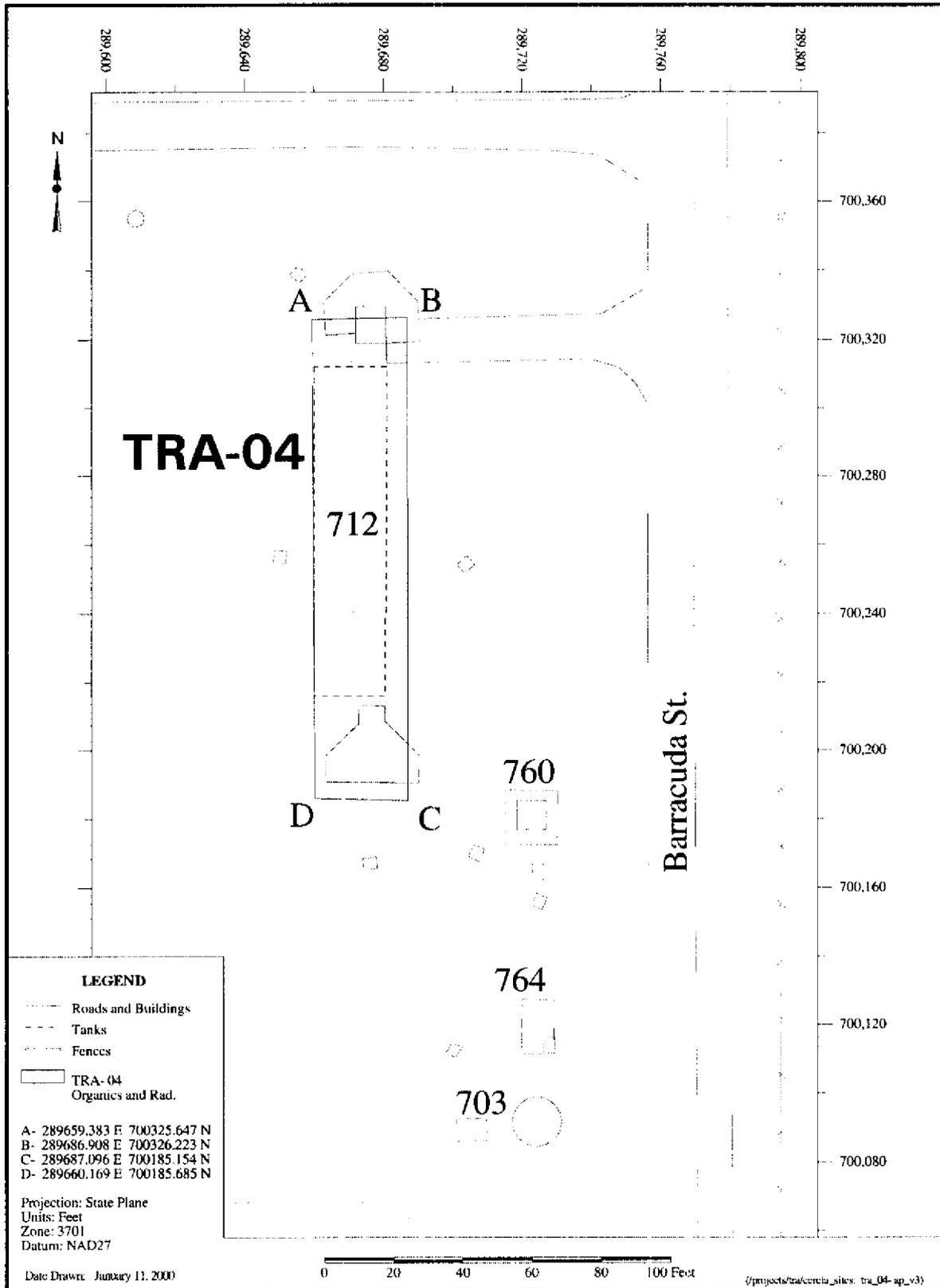


Figure 2-10. Map of TRA-04, Warm Waste Retention Basin surficial sediments.

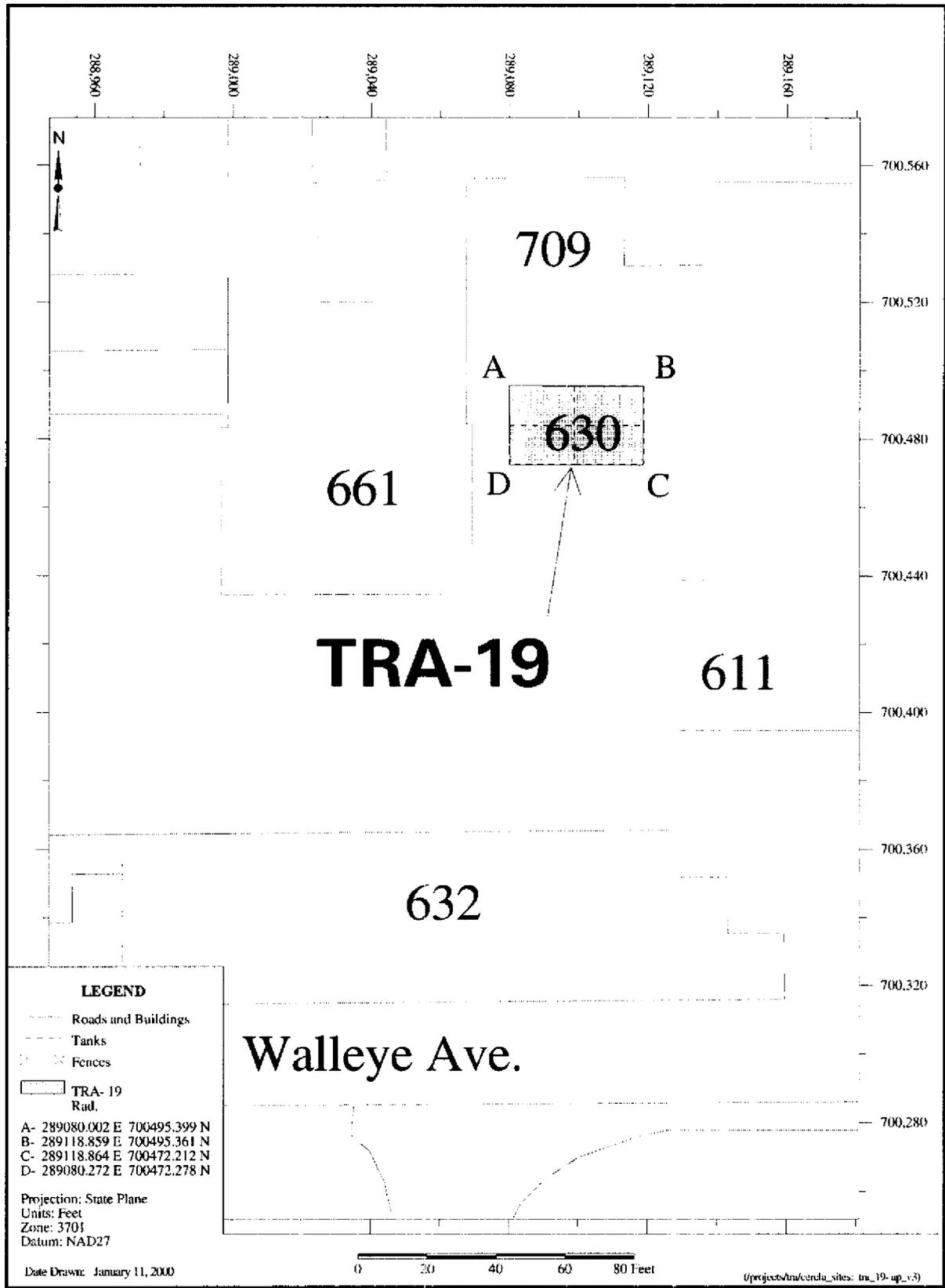


Figure 2-11. Map of TRA-19, Rad Tanks 1 and 4 at TRA-630.

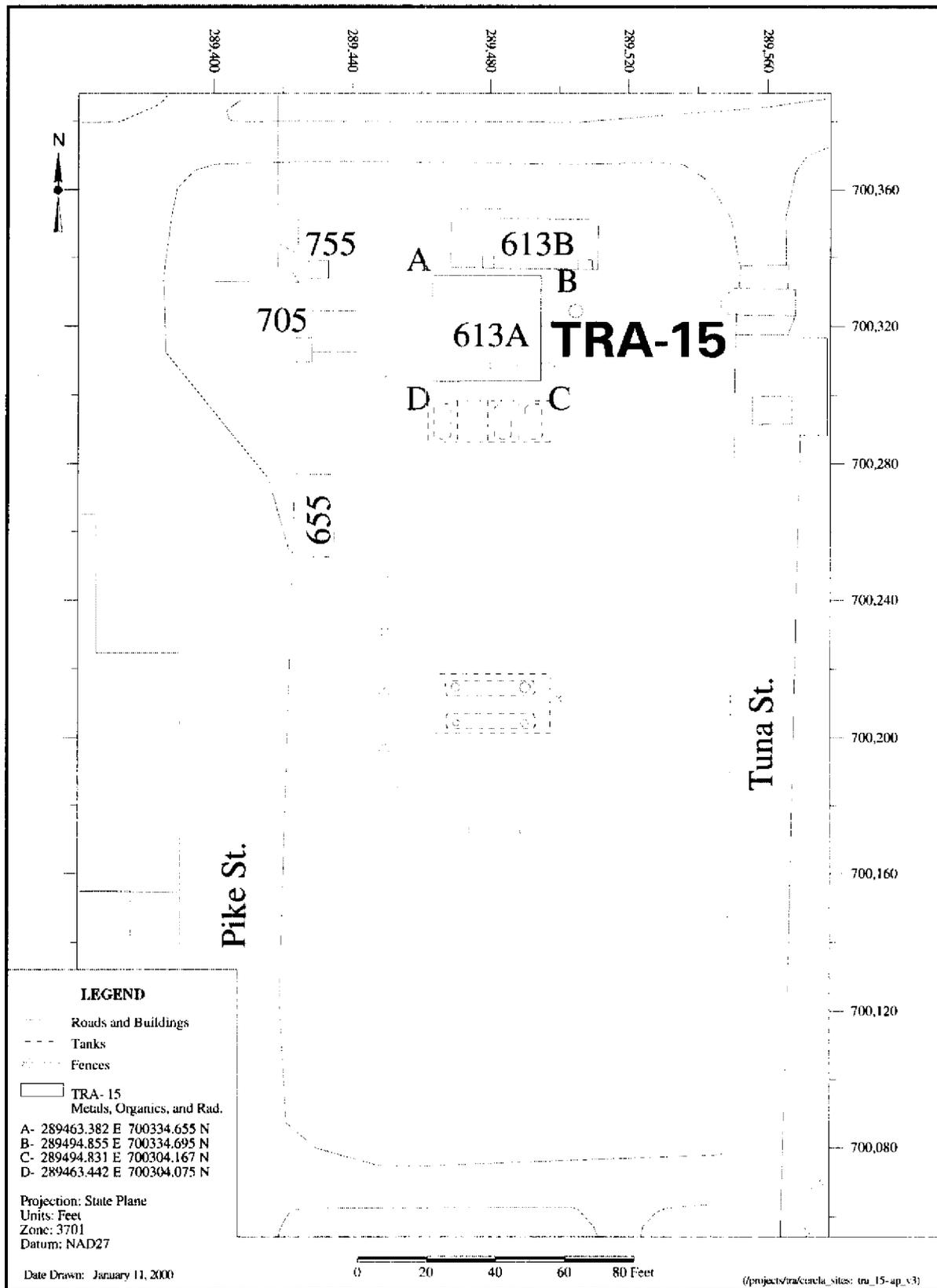


Figure 2-12. Map of TRA-15. Hot Waste Tanks 2, 3, and 4 at TRA-713.

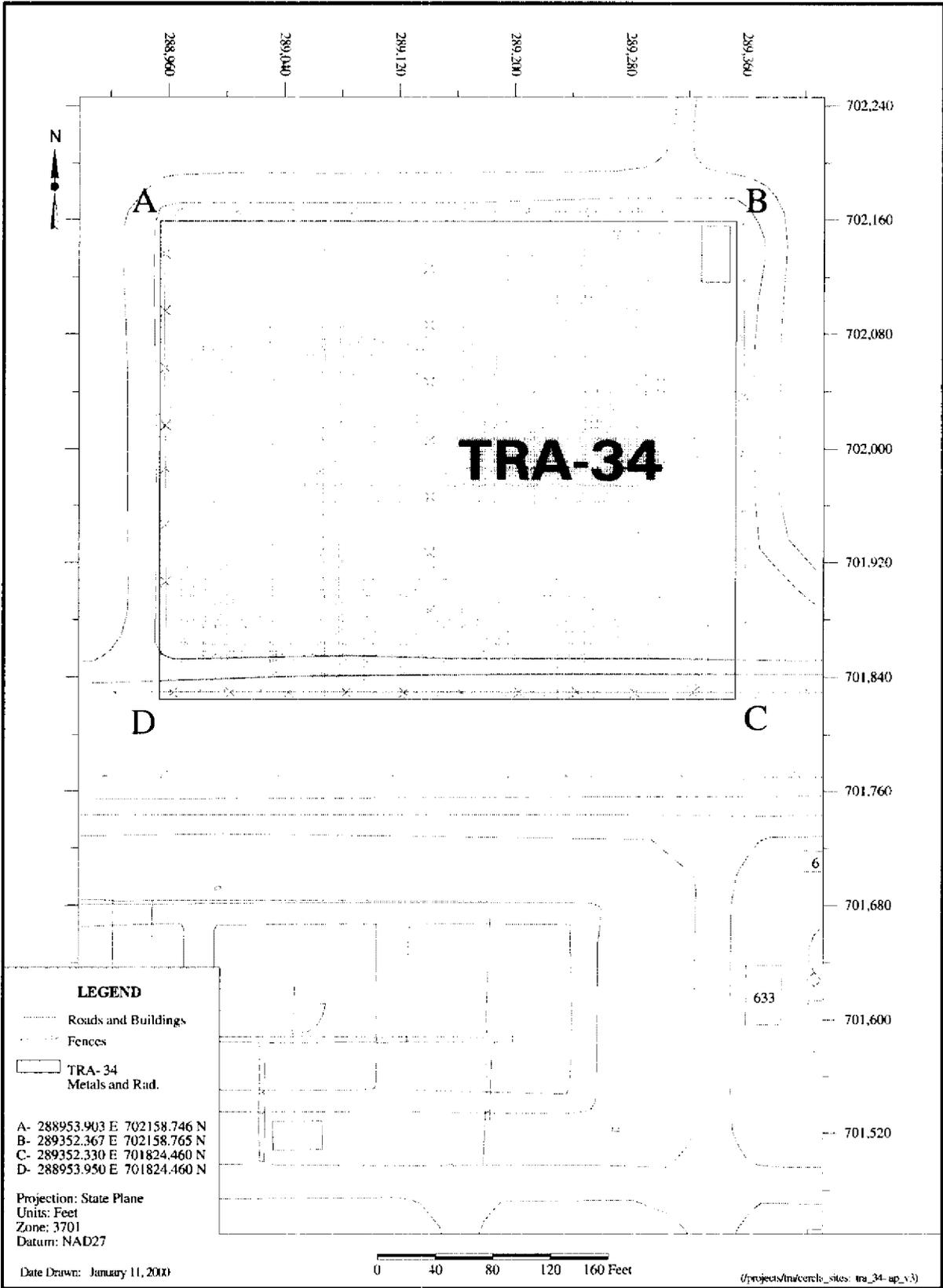


Figure 2-13. Map of TRA-34, North Storage Area.

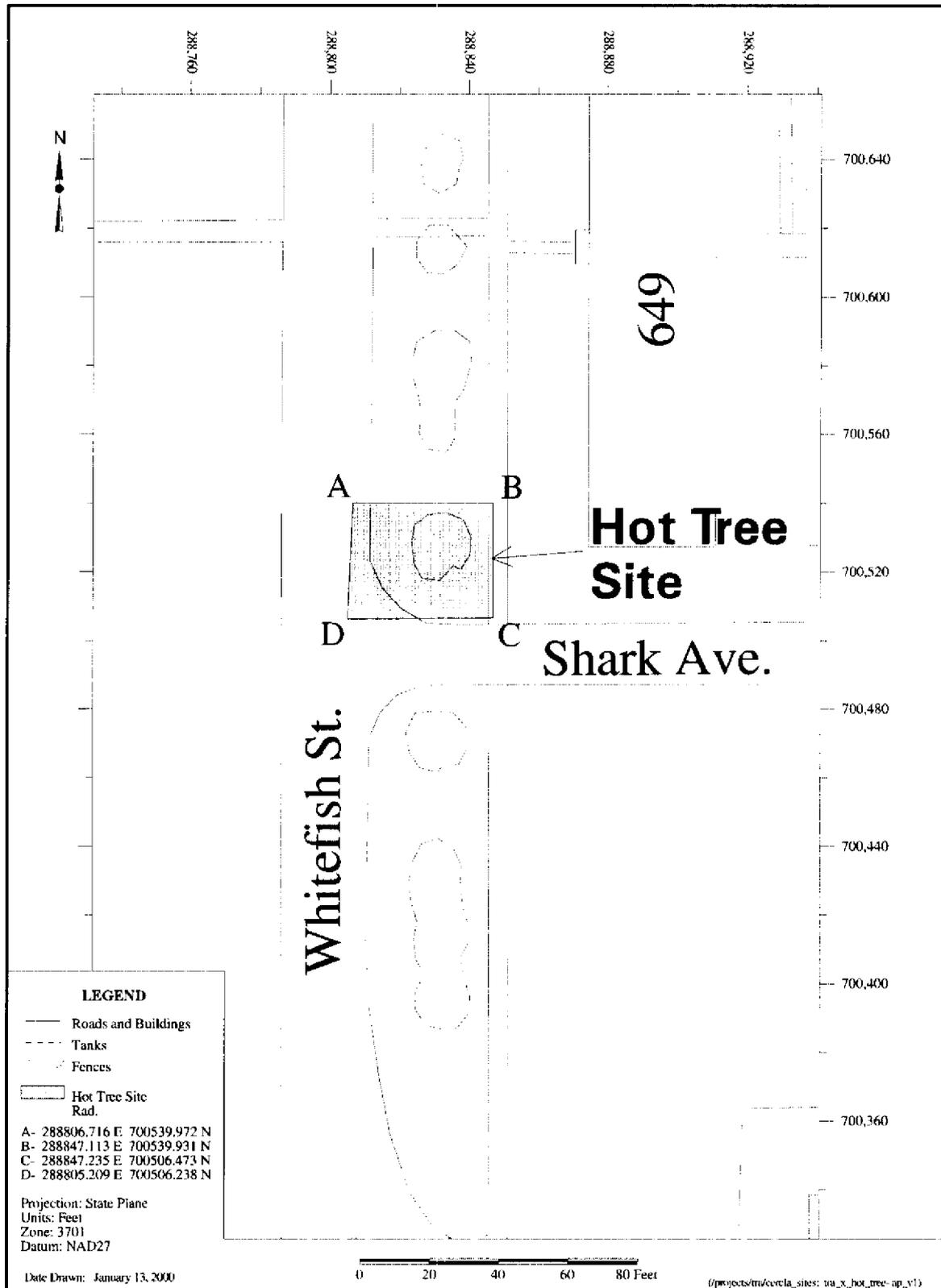


Figure 2-14. Map of the Hot Tree Site.

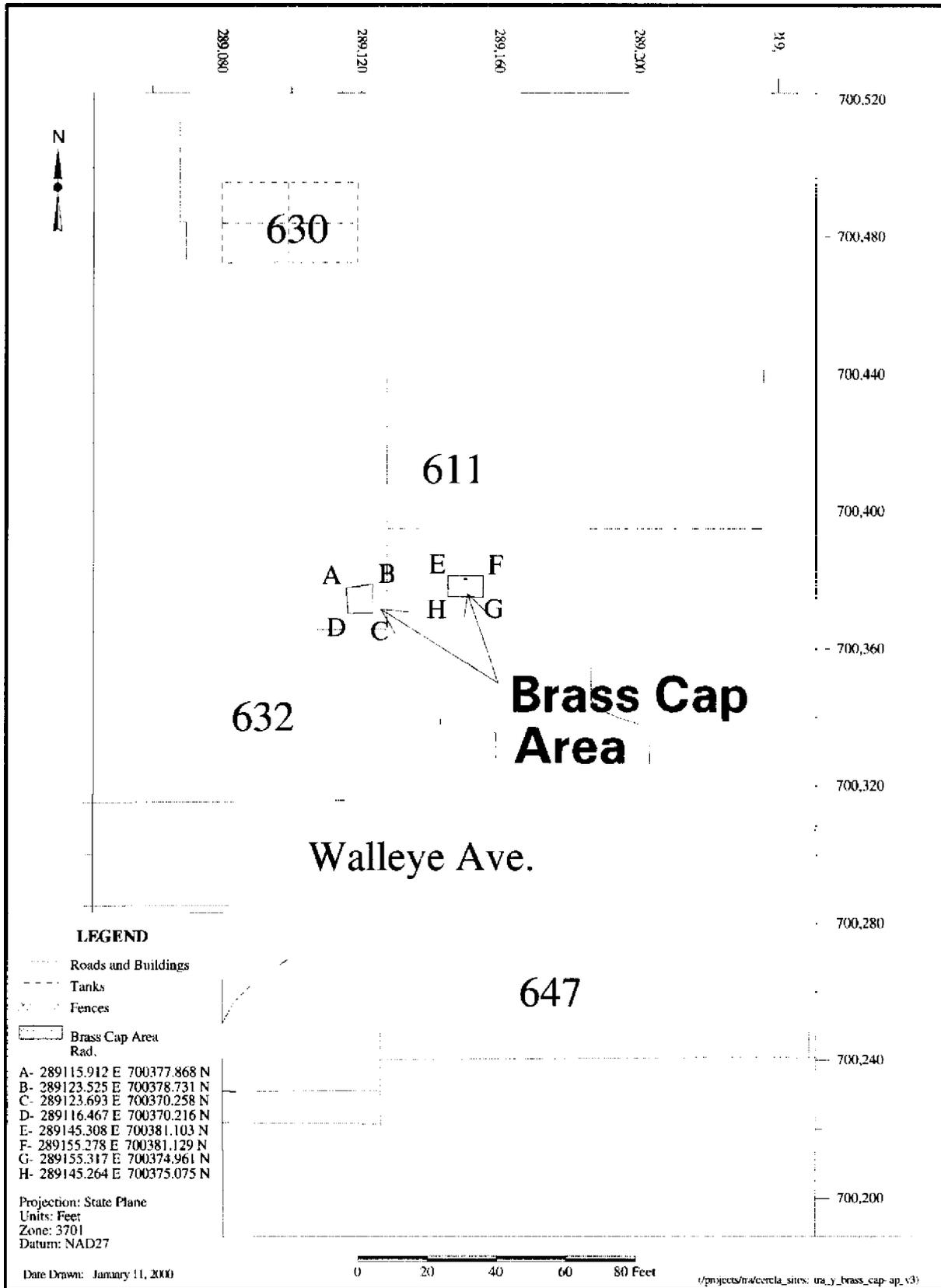


Figure 2-15. Map of the Brass Cap Area.

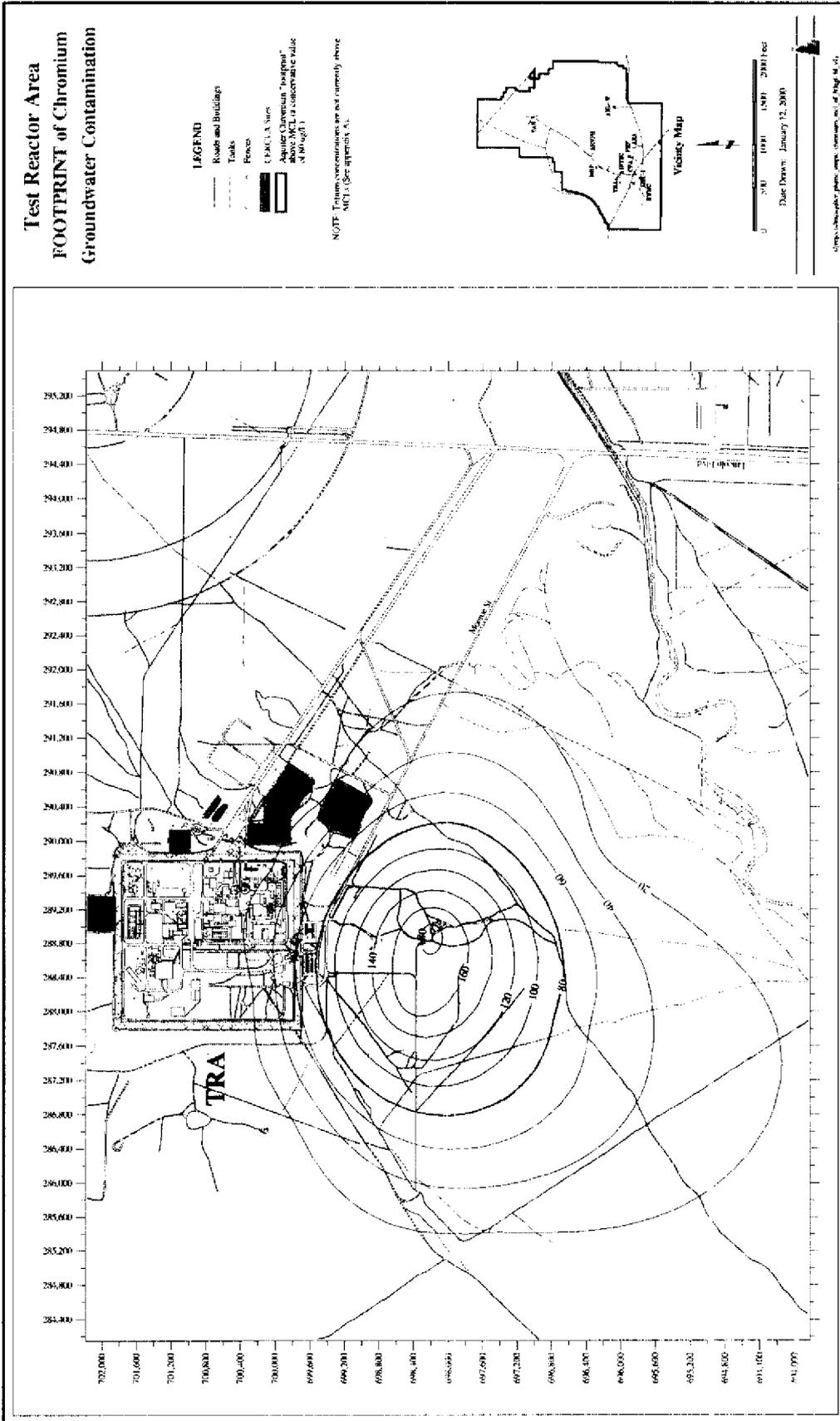


Figure 2-16. Map of the Groundwater Plume.

3. INSTITUTIONAL CONTROLS

Some waste sites at TRA require institutional controls as part of the remedy. These sites and the basis for these institutional controls are listed in Table 3-1. In addition, seven No Action sites also require institutional controls to preserve the underlying assumptions of the RI/FS and ROD on which the No Action determination was made. These sites and the basis for these institutional controls are listed in Table 3-2. The calculated risk for three No Action sites with current residential risk greater than 1E-04 are included in Appendix F. The waste site specific contaminants of concern (COCs), contamination depth, land use control objectives, and controls during U.S. Department of Energy (DOE) operations, after DOE operations under DOE control, and after DOE control are included in Appendix B.

3.1 Types of Institutional Controls

Institutional controls include:

- Visible access restrictions
- Procedures to control activities
- Publishing of surveyed boundaries and controls in the INEEL Land Use Plan
- Notice to affected stakeholders
- Property lease and transfer regulatory requirements.

More details on what each institutional control involves are presented in the following sections.

3.1.1 Visible Access Restrictions

Visible access restriction institutional controls deal with visual signs or barriers that restrict personnel access to a specific waste site. In the case of WAG 2 OU 2-13, these restrictions will be warning signs and/or permanent markers. Brass corner markers are installed at the WWP and SCA. Aluminum signs 0.5 by 0.6 m (1.5 ft by 2 ft) with the site name and "Keep Out" are posted in multiple locations on the SLP, CP, and WWP Sites (12 at SLP, 8 at CP, and 18 at WWP). Additional warning signs on the other institutionally controlled sites clearly identify waste site number and point of contact and his/her phone number and include the statement "Do not disturb." In addition, four permanent granite markers are located on each side of the WWP (north, south, east, and west). Each marker is 0.9 by 1.2 by 3 m (3 by 4 by 10 ft) wide with an imbedded brass corner marker on the top. Each granite marker has three pictures on it indicating: (1) no walking, (2) poison, and (3) radioactivity.

3.1.2 Control of Activities

Control of activity institutional controls are used to administratively control activities that can be performed at the waste site. These institutional controls will cover all entities and persons, including, but not limited to employees, contractors, lessees, and visitors that access a controlled waste site. They cover all activities and reasonably anticipated future activities, including, but not limited to, any future soil disturbance, routine and non-routine utility work, well placement and drilling, recreational activities,

paving, training activities, construction, or renovation work on structures or other activities which might occur at a waste site.

Table 3-1. Sites with remedies requiring institutional controls.^a

Site Code	Site Name	ROD Selected Remedy	Basis for Institutional Controls	Institutional Controls
TRA-03	TRA Warm-Waste Pond (Sediments)	Containment with an engineered soil cover and institutional controls.	Containment barrier has been put in place. Current occupational risk is 2E-02. 100 year future residential risk is >1E-04.	Restrict site to occupational access for more than 30 years and restrict to industrial land use only until residential risk is <1E-04 based on the results of a 5-year review.
TRA-06	TRA Chemical Waste Pond (TRA 701)	Containment with a native soil cover and institutional controls.	Native soil cover in-place. Hazard quotient greater than 1 for mercury via homegrown produce ingestion and soil ingestion at a depth of 14 feet.	Industrial land use is unrestricted. Restrict residential land use to depths less than 14 feet.
TRA-08	TRA Cold Waste Disposal Pond (TRA-702)	Excavation and disposal.	Soil excavated and disposed of to 1E-04 future residential risk cleanup levels.	Restrict site to industrial land use for less than 100 years until residential risk is <1E-04 based on the results of a 5-year review.
TRA-13	TRA Sewage Leach Ponds (2) by TRA-732	Containment with a native soil cover and institutional controls.	Containment barrier has been put in place. Current occupational risk is 1E-03 for Cs-137 and Ag-108. 100 year residential risk is 5E-04 at a depth of 14 feet. The hazard quotient (HQ) is greater than 1 for mercury and zinc via homegrown produce ingestion.	Restrict site to occupational access for more than 30 years and restrict to industrial land use only until residential risk is <1E-04 based on the results of a 5-year review.

Table 3-1. (continued).

Site Code	Site Name	ROD Selected Remedy	Basis for Institutional Controls	Institutional Controls
TRA-15	TRA Hot Waste Tanks 2, 3, 4 at TRA-613 (TRA 713-B, 713-C, and 713-D)	Limited action.	Tanks still in use. Current occupational risk 3E-04, 100 year future residential risk is 1E-04. Additional contaminated soils are greater than 13 feet deep to basalt at 37 feet. Risk assessment is not done at this depth.	Restrict occupational access for less than 100 years until risk is <1E-04 based on a 5-year review. After the above restriction is removed, restrict land use at depths greater than 10 feet until otherwise evaluated.
TRA-19	TRA Rad Tanks 1 and 4 at TRA-630, Replaced by Tanks 1, 2, 3, & 4 (TRA 730-1, 730-2, 730-3, 730-4)	Limited action with implementation of a contingent excavation and disposal option.	New tanks still in use. Current occupational risk is 2E-01 for Cs-137. 100 year residential risk is 8E-02.	Restrict occupational access and prohibit residential development until soil is removed or status is changed in a 5-year review.
None	Sewage Leach Pond Soil Contamination Area	Limited Action	2E-04 current occupational risk, 30 year occupation risk and 100 year residential risk is < 1E-04	Restrict occupational access until risk is <1E-04 based on the results of a 5-year review.
None	Brass Cap Area	Limited action with implementation of a contingent excavation and disposal option.	3E-01 current occupational risk and 8E-02 30 year future occupational risk. 8E-02 100 year future residential risk.	Restrict occupational access and prohibit residential development until removed or status is changed in a 5-year review.

a. Source of information is DOE-ID 1997b.

Table 3-2. No action sites requiring institutional controls.

Site Code	Site Name	ROD Selected Remedy	Basis for Institutional Controls ^a	Institutional Controls
None	TRA PCB Spill at TRA-619	“No action”	22 ppm PCBs in soil under pad which is below the 25 ppm for restricted industrial areas and greater than the 10 ppm for general nonrestricted use (40 CFR 761.125(c)(4)). 2.9E-05 residential risk. Track 2 No Further Action.	Restrict this site to industrial land use only to preserve industrial only land use assumption.
None	TRA PCB Spill at TRA-626	“No action”	24 ppm PCBs in soil >4 feet deep which is below the 25 ppm for restricted industrial areas and greater than the 10 ppm for general nonrestricted use (40 CFR 761.125(c)(4)). 3.6E-05 residential risk. Track 2 no further action.	Restrict this site to industrial land use only to preserve industrial only land use assumption.
None	TRA PCB Spill at TRA-653	“No action”	PCBs \leq 25ppm in soil which is below the 25 ppm for restricted industrial areas and greater than the 10 ppm for general nonrestricted use (40 CFR 761.125(c)(4)). 1.3E-05 residential risk. Track 2 No Further Action.	Restrict this site to industrial land use only to preserve industrial only land use assumption .
TRA-04	TRA Warm-Waste Retention Basin, Surficial sediments (TRA-712)	“No action”	5E-04 current residential risk for 10 ft and less. Risk evaluation not done for contamination at 40 ft deep.	Restrict site to industrial use only for less than 10 feet deep. Restrict land use for deeper contamination until evaluated otherwise.
TRA-34	TRA North Storage Area	“No action”	3.5E-05 100 year residential risk. 1.2E-04 current residential risk for Ag-108m, Cs-137, and Eu-152.	Restrict land use to industrial, until risk is less than E-04 based on a 5-year review.

Table 3-2. (continued).

Site Code	Site Name	ROD Selected Remedy	Basis for Institutional Controls ^a	Institutional Controls
None	Hot Tree Site	"No action"	2E-04 current residential risk from Cs-137. 2E-05 risk after 100 years.	Restrict site to industrial land use only for approximately 30 years until residential risk is less than E-04 based on the results of a 5-year review.
None	Perched and Snake River Aquifer Groundwater	"No action With Monitoring"	Cr concentrations are greater than MCLs and are predicted to decrease below MCLs within 20 years. (H-3 concentrations are below MCLs – see appendix A)	Restrict drilling of wells for drinking water usage until contaminants are below MCLs based on the results of a 5-year review.

a. Source of information is DOE-ID 1997b, DOE-ID 1997a, and Appendix E of this document.

CFR = Code of Federal Regulations.

MCL = maximum contaminant level.

These administrative controls include, but are not limited to:

- Procedures (including construction activities) that require a review and/or approval before activities can be performed at the waste site (see Appendix F for an example of current procedures that do this)
- DOE-ID Directives.

3.1.3 INEEL Land Use Plan

A map based on surveyed coordinates of the institutionally controlled waste sites and a list of the required institutional controls will be published in the INEEL Comprehensive Land Use Plan. The following will be included in this list: (1) the objective of the restriction or control, (2) the control or restriction, (3) the time frame that the restrictions apply, (4) the tools and procedures that will be used to implement the restrictions or controls and to evaluate the effectiveness of these restrictions or controls, and (5) a point of contact. All workers may visually see the affected areas and the access control procedures will reference these maps. The Land Use Plan will be used as a tracking mechanism for changes to land use and land use controls by controlling and documenting revisions to these maps. The Land Use Plan, located on the web, will be kept current by a Comprehensive Facilities and Land Use Plan (CFLUP) coordinator.

3.1.4 Notice to Affected Stakeholders

Some waste sites require that special notification be made to affected stakeholders prior to any change in land use designation, land-use restriction, or users. When a land use designation or restriction changes through the 5-year review process, affected stakeholders will be notified of that change. If and when the option for removal is exercised that would change the land use designation and restrictions for TRA-19 and the BCA, the EPA and the State of Idaho will be notified at least 6 months before the removal occurs. Specifics on the EPA and the State of Idaho's notifications of change in users are discussed further in Section 6, Leasing or Transfer of Property. The specific stakeholders include, but are not limited to the following:

- Bureau of Land Management
- Shoshone Bannock Tribal Council
- U.S. Fish and Wildlife Service
- Local county governments
- State of Idaho
- EPA.

3.1.5 Property Lease and Transfer Regulatory Requirements

Property lease and transfer regulatory requirements are summarized in Section 6.

3.2 Response to Failed Institutional Controls

Notification to the EPA and the State of Idaho within 48 hours will be made by the DOE upon discovery of any activity that is inconsistent with the institutional control objectives for the waste site, or of any change in the land use or land use designation of a waste site addressed in the ROD. Failure of an institutional control objective could include any of the following:

- The integrity of an engineered or native cover is breached
- A waste site that is controlled for industrial land use is used for a residential activity.

The DOE will work together with the EPA and the State of Idaho to determine a plan of action to rectify the situation, except in the case where the DOE believes the activity creates an emergency situation, the DOE can respond to the emergency immediately upon notification to EPA and the State of Idaho and need not wait for EPA or State of Idaho input to determine a plan of action. The DOE will also identify what went wrong with the institutional control process, evaluate how to correct the process to avoid future problems, and implement these changes after consulting with EPA and the State of Idaho.

Failure of an institutional control objective will commonly be found at the time of the annual inspection or during a 5-year review, although it may be found at any time.

3.3 Changing/Removing Institutional Controls

The adequacy of the continued use of institutional controls will be evaluated during the 5-year review process. Institutional controls will not be deleted or terminated, unless EPA and the State of Idaho have concurred in the deletion or termination based on the results of a 5-year review and it is documented as part of the 5-year review process (see Section 5).

4. INSPECTION AND MAINTENANCE

Inspection/monitoring and maintenance requirements for native soil and engineered covers are summarized in Table 4-1. Inspections of the WAG 2, OU 2-13 sites will fall into three types:

1. Annual scheduled inspections
2. Follow-up inspections
3. Contingency inspections.

Scheduled inspections are summarized in Table 4-2. Follow-up inspections for repair/replacement activities will occur as determined by the WAG 2 contractor project manager. Contingency inspections are unscheduled inspections ordered by DOE-ID; trigger events for these inspections may include severe rainstorms, floods, or highly unusual events such as tornadoes or earthquakes.

The WAG 2 contractor project manager will record inspection results on the attached inspection reporting forms for sites with native soil and engineered covers (Appendix C) and forms for sites with institutional controls (Appendix D) per the schedule in Table 4-2. The forms will be completed, signed, dated, and submitted to DOE-ID on an annual basis in the O&M report, or as needed in the case of contingency inspections. The institutional control inspection results will be used to draft the O&M report (see Section 7) which includes the institutional control monitoring report (Appendix E). The drawings of the WWP, CP, and SLP in the remedial design/remedial action (RD/RA) work plan and the maps in this plan will aid the inspector in identifying locations of required maintenance or repair.

Every 5 years, the frequency of inspection and reporting will be reevaluated by DOE-ID, EPA Region 10, and Idaho Department of Health and Welfare (IDHW)/DEQ.

No routine maintenance is planned for the sites. Unscheduled custodial maintenance activities will be determined during inspections. A work plan citing required maintenance activities, as identified by inspection reports, will be submitted to DOE-ID by the WAG 2 contractor project manager. The work plan will include a technical work scope, cost estimate, schedule, a reference list of existing applicable technical specifications and drawings, and health and safety requirements. A completion report should be sent to DOE-ID when the maintenance is done (see Section 7).

Photographs will be used to enhance the informative quality of the comprehensive documentation whenever possible, particularly when scheduled maintenance activities result in comments by the inspector. A record of these photographs, preserved in a site inspection photo log, will be maintained by the WAG 2 project manager and made available for review by the DOE-ID, EPA Region 10, and the IDHW/DEQ.

Table 4-1. Inspection/monitoring and maintenance requirements for native soil and engineered covers.

Reference ^a	Requirement	Action
Warm Waste Pond (TRA-03)	Periodic inspection and maintenance, following completion of the covers, to ensure cover integrity and surface drainage away from the covers.	Annual inspections and maintenance of the soil cover integrity will be performed.
	Periodic aboveground radiological surveys, following completion of the covers, to assess the effectiveness of the remedial action.	Annual surface radionuclide survey around the perimeter of the soil covers will be performed.
Chemical Waste Pond (TRA-06)	Periodic inspection and maintenance, following completion of the covers, to ensure cover integrity and surface drainage away from the covers.	Annual inspections and maintenance of the soil cover integrity will be performed.
Sewage Leach Pond and soil contamination area (TRA-13)	Periodic inspection and maintenance, following completion of the covers, to ensure cover integrity and surface drainage away from the covers.	Annual inspections and maintenance of the soil cover integrity will be performed.
	Periodic aboveground radiological surveys, following completion of the covers, to assess the effectiveness of the remedial action.	Annual surface radionuclide survey over the soil covers will be performed.

a. Declaration of the OU 2-13 ROD (DOE-ID 1997a).

Table 4-2. Summary of the OU 2-13 inspection schedules.

Inspections	Frequency
Vegetative cover integrity ^a	Annually in late summer for 3 years following seeding
Native-Soil cover erosion ^a	Annually for 5 years ^f
Engineered cover settling and erosion ^b	Annually for 5 years ^f
Radiological surveys ^c	Annually for 5 years ^f
Surface water runoff effectiveness ^d	Annually for 5 years ^f
Institutional controls ^e	
• Signs and postings integrity	Quarterly for 5 years ^f Annually for 5 years ^f
• Activity control and access control procedures	Annually for 5 years ^f
• Land use change and notification procedures	Annually for 5 years ^f
• Inclusion in land use plan	

a. CP and SLP only.

b. WWP only.

c. WWP and SLP only.

d. CP, SLP, and WWP.

e. All sites with institutional controls.

f. Continued frequency of inspections will be re-evaluated in the 5-year review.

4.1 Inspection of Engineered Cover

The engineered barriers at the TRA WWP Cells 1952, 1957, and 1964 will be inspected annually. All cells will require a visual perimeter walk-around inspection to look for subsidence in the covers. If subsidence has occurred, coarse gravel will be used to fill the voids of the affected area. This may or may not require moving rip rap to access the affected area. Information concerning the subsidence will be recorded on inspection forms, as shown in Appendix C of this document.

Both cells will require visual inspections annually for animal intrusions and subsidence by a general walk-through on the covers themselves. If subsidence or animal intrusion has occurred, appropriate soil will be placed to bring the affected area up to the surrounding grade, as determined by visual approximation. The information obtained during these inspections will be recorded on the applicable inspection reporting forms in Appendix BC of this document

4.2 Inspection of Native Covers

The reseeded CP and SLP native soil covers will be monitored qualitatively during annual late summer inspections for 3 years following initial inspection to ensure proper growth. Initial reseeding

occurred in the fall of 1999. Qualitative determinations of nongrowth or sparse growth areas will be made through comparative growth evaluations in undisturbed areas near the containment systems with consideration of the length of time since planting. Information will be recorded on the inspection reporting forms shown in Appendix C of this document.

Areas experiencing seeding failure, as evidenced by lack of perennial grass establishment, and invasion by weeds (primarily Russian thistle, cheatgrass, and tumble mustard) will be documented and photographed. Reseeding and fertilization procedures will be in accordance with the requirements of Specifications Section 02930 (Appendix B of the RD/RA work plan [DOE-ID 1998b]). Reseeded areas will require follow-up inspections in late summer for 3 years to verify successful reseeded.

During the inspections of the reseeded covers, qualitative information on surface erosion will be collected in the revegetated zones. Observations of soil movement, as evidenced by the accumulation of soil on the up-slope side of plants, pedestalling of plants or rocks, or the formation of rills or gullies, will be recorded on inspection reporting forms in Appendix C of this document, with the extent of erosion noted. If rills and gullies have occurred, appropriate soil will be added and compacted to bring the affected area up to the surrounding grade, as determined by visual approximation, and then seeded. Photographs will be taken as needed.

4.3 Radiological Monitoring

Surface radiological monitoring will be performed to identify potential contaminant migration from the WWP and SLP and to ensure that the existing institutional controls are protective of occupational exposure for the SCA. For the WWP, SLP, and SCA, annual radiological surface surveys will be performed around the perimeter of the cover using a global positioning radiometric scanner (GPRS) mounted on the front of a four-wheel drive vehicle. The GPRS system will be used to locate and document areas of high gamma activity. For areas identified by the GPRS that are above previous surveys, a high purity germanium portable in situ gamma spectroscopy detector will be used to determine whether the radiological contamination is above the final remediation goals (FRGs), as identified in the OU 2-13 ROD (DOE-ID 1997a). If radionuclide contamination is above the FRGs, the DOE-ID, EPA Region 10, and the IDHW/IDEQ must be notified and corrective actions will be determined by these agencies.

5. FIVE-YEAR REVIEW

In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) for sites where contamination is left in place above risk based concentration, a review of the selected remedy will be conducted by EPA no less than every 5 years, until determined by the Agencies to be unnecessary. The 5-year review will evaluate the remedy to determine if it is being protective to human health and the environment. For OU 2-13, six sites will need to be evaluated during the first 5-year review (WWP, CP, SLP, Soil Surrounding Hot Waste Tanks at Building 613, Soil Surrounding Tanks 1 and 2 at Building 630, and Brass Cap Area). For those sites for which no action is being taken, based on land use assumptions, those assumptions will also be reviewed as part of the 5-year review. Based on the results of this review, institutional controls may be removed or added, and waste sites may be removed from further review. Affected stakeholders will be notified prior to a land use designation or restriction change. (See Section 3.1.4) These changes will be documented as part of the 5-year review process.

6. LEASING OR TRANSFER OF PROPERTY

The DOE will notify the EPA and State of Idaho at least 6 months prior to any WAG 2 OU 2-13 transfer, sale, or lease of any property, subject to institutional controls required by the WAG 2 OU 2-13 ROD, so that the EPA and the State of Idaho can be involved in discussions to ensure that appropriate provisions are included in the conveyance documents to maintain effective institutional controls. If it is not possible for the DOE to notify the EPA and the State of Idaho at least six months prior to any transfer, sale or lease, the DOE will notify the EPA and the the State of Idaho as soon as possible, but no later than 60 days prior to the transfer, sale or lease of any property subject to institutional controls. Options for leasing or transferring property are summarized in Table 6-1. It is not anticipated that the land in this WAG will be subject to leasing or property transfer for at least 100 years.

The Hall Amendment of the National Defense Authorization Act of 1994 (Public Law 103-160) requires concurrence from the EPA on the lease of any National Priorities List sites during the period of DOE control and CERCLA [42 USC 9620 (h) (3)] requires that the state be notified of a lease involving contamination. When DOE no longer manages INEEL activities, and controls are needed, CERCLA [42 USC 9620(h)(3)] requires that DOE indicate the presence of contamination and any restrictions in property transfer documentation. These regulatory requirements for leasing property or transferring property that govern deeds and covenants are summarized in Table 6-2. In-house procedures will include these requirements in order to preserve their existence, and inspections will evaluate their continued existence.

Table 6-1. INEEL NPL site property closeout options, based on legal status and DOE need.^a

Legal Status/Need	Options					
	Use within DOE	Return to Owner	Relinquish to DOI	Report to GSA	Sell or grant under AEA	Lease under AEA or DOE Org. Act
Acquired or Withdrawn and Required for Mission Need	X					
Privately or State Owned and No DOE Need		X				
Acquired and Excess to DOE				X	X	X
Acquired and Temporarily Not Needed						X
Withdrawn and Excess to DOE			X			
Withdrawn and Temporarily Not Needed						X

a. Modified from, DOE, 1997, *Department of Energy Small Sites: Summary Guide to Closeout Requirements*, DOE/EM-0333.

DOI = Department of Interior

GSA = General Services Administration

AEA = Atomic Energy Act

Table 6-2. Requirements for INEEL property transfer relevant to CERCLA sites.

Requirements and Objectives of Closeout	Under DOE Control			DOE Control Relinquished		
	Property used Within DOE	DOE Leases Property	Property Returned to Private or State Owner	Property Reported to GSA for Disposition	Property Relinquished to DOI	DOE Sells Property
Objectives of Closeout	Fully identify and document the roles and responsibilities of EM and the new or existing DOE landlord program office relative to the environmental conditions of the property.	Convert the property to its most beneficial use while protecting the interests of DOE and the affected communities.	Eliminate DOE's future liability at the site by demonstrating that it has removed all hazardous substances attributable to DOE use of the property Or Limit DOE liability by recording levels of any contaminants or hazardous substances it is leaving on the site as part of the remedial action.	Satisfy GSA requirements as efficiently as possible.	Satisfy DOI requirements as efficiently as possible.	Convert the property to its most beneficial use while protecting the interests of DOE and the affected communities

Requirements	Source						
Document the NEPA CX, as appropriate.	Appendix A to Subpart D of 10 CFR 1021	X	X	X	X	X	X
Complete an NEPA EA or EIS if a CX is not appropriate.	40 CFR Parts 1500-1516	X	X	X	X	X	X
Use a CRS to document items and conditions of transfer of assets between DOE programs.	DOE Order 430 Section 6g(1)	X					

Table 6-2. (continued).

Requirements and Objectives of Closeout		Under DOE Control		DOE Control Relinquished			
		Property used Within DOE	DOE Leases Property	Property Returned to Private or State Owner	Property Reported to GSA for Disposition	Property Relinquished to DOI	DOE Sells Property
Requirements	Source						
Deed must include a covenant stating that remedial action is complete (or remedy is demonstrated to be operating properly and successfully) and any subsequent remedial action that is required and is attributable to DOE will be conducted by the U.S.	CERCLA section 120(h)(3) (42 U.S.C 9620 (h)(3))			X	X	X	X
If the covenant does not include the warranty that all remedial action has been taken, include the following in the transfer document: restrictions on property use necessary to protect human health and the environment and not interfere with remedial activities, a guarantee that all necessary response actions be taken, identification of schedules for necessary response actions, and assurances that budget requests will be made for response actions.	CERCLA Section 120(h)(3)(C)(ii) (42 U.S.C. 9620(h)(3)(C)(ii))			X	X	X	X

6-4

Table 6-2. (continued).

Requirements and Objectives of Closeout		Under DOE Control		DOE Control Relinquished			
		Property used Within DOE	DOE Leases Property	Property Returned to Private or State Owner	Property Reported to GSA for Disposition	Property Relinquished to DOI	DOE Sells Property
Requirements	Source						
The covenant must include a clause which reserves to the U.S. access to the property in any case in which an investigation, response, or corrective action is found to be necessary after the date of transfer.	CERCLA Section 120(h)(3)(A)(iii) (42 U.S.C. 9620 (h)(3)(A)(iii))			X	X	X	X
6-9 Notice of the type and quantity of hazardous substances and the time at which such substances were stored, released, or disposed of in the contract for sale or transfer and deed.	CERCLA Section 120(h)(1)-(3) (42 U.S.C. 9620 (h)(1)-(3)) 40 CFR 373			X	X	X	X
Notify states of sites to be closed that are encumbered by a lease beyond the closure date and that are contaminated.	CERCLA Section 120(h)(5) (42 U.S.C. 9620 (h)(5))		X				

Table 6-2. (continued).

Requirements and Objectives of Closeout		Under DOE Control		DOE Control Relinquished			
		Property used Within DOE	DOE Leases Property	Property Returned to Private or State Owner	Property Reported to GSA for Disposition	Property Relinquished to DOI	DOE Sells Property
Consult with and request the concurrence of the EPA Administrator for proposed leases that are on the NPL.	Hall Amendment-Section 3154 of the FY 94 National Defense Authorization Act, (which amends Section 646 of the DOE Organization Act (42 U.S.C. 7256 (e)(1)-(2)))		X				X
Requirements	Source						
Identify uncontaminated parcels of land.	CERCLA Section 120(h)(4) (42 U.S.C. 9620 (h)(4))			X	X	X	X
Notice of Intent to relinquish property, including extent and nature of contamination and measures which have been and should be taken to protect the public from contamination.	43 CFR 2372.1					X	

6-9

Table 6-2. (continued).

Requirements and Objectives of Closeout		Under DOE Control		DOE Control Relinquished			
		Property used Within DOE	DOE Leases Property	Property Returned to Private or State Owner	Property Reported to GSA for Disposition	Property Relinquished to DOI	DOE Sells Property
Continue to be accountable and responsible for the property until completion of decontamination of the property of all dangerous materials and restoration to a suitable condition; or posting the property and installing protective devices and agreeing to maintain notices and devices.	43 CFR 2374.2					X	
Requirements	Source						
Property report which includes history of hazardous substance activity, presence of asbestos and/or PCBs, and easements. Must describe extent of contamination and the extent to which the property can be used without further decontamination.	41 CFR 101-47.202-1, -2, and -7				X		
Determine if reuse is compatible with the AEA and advances the purposes of the Act.	AEA Section 161(g)	X		X	X	X	X

6-7

Table 6-2. (continued).

Requirements and Objectives of Closeout	Under DOE Control		DOE Control Relinquished			
	Property used Within DOE	DOE Leases Property	Property Returned to Private or State Owner	Property Reported to GSA for Disposition	Property Relinquished to DOI	DOE Sells Property
AEA = Atomic Energy Act						
CRS =-confirmed release site						
CX =-categorical exclusion						
DOI = Department of Interior						
EA = environmental assessment						
EIS = Environmental Impact Statement						
EM = Environmental Management						
FY = fiscal year						
GSA = General Services Administration						
NEPA = National Environmental Policy Act						
NPL = National Priorities List						

7. REPORTING

The draft remedial action report was submitted on March 10, 2000 to the agencies for review, per agreement with the agencies. The O&M report is the only planned report. It will include the institutional controls monitoring report. Another report is a completion of maintenance report that defines any maintenance work performed, including record drawings of any maintenance work that alters the design configuration of the WWP engineered covers or the SLP and CWP native-soil covers.

The O&M report will be submitted to EPA and IDHW/IDEQ on an annual basis for 5 years. It will contain documentation of scheduled inspections, follow-up and contingency inspections, and maintenance activities. It will include:

- General OU description and operational history
- A summary of the inspection
- A summary of maintenance activities to date
- An estimate of maintenance activities required in the next year
- An assessment of cover inspection data, and applicable photos
- Institutional controls monitoring report and applicable photos
- A list of field inspector names and qualifications
- A copy of the appropriate inspection report forms.

Unless otherwise directed in the 5-year review, only the institutional controls (IC) monitoring report will be submitted annually thereafter. Continued annual submittal of the IC monitoring report is subject to change in the 5-year review.

8. RECORDKEEPING

A set of the records specific to WAG 2 OU 2-13 will be kept in the project files and the INEEL Environmental Restoration Information Repository (ERIS). The records will include, but not be limited to, the following:

- O&M plan, including surveyed coordinates of the waste sites and applicable institutional controls
- O&M reports, including IC monitoring reports, inspection checklists, and maintenance records
- Institutional control monitoring reports if a complete O&M report was not prepared
- Notifications of failed institutional controls
- Notifications to affected stakeholders
- Five-year review documentation.

9. RESPONSIBILITIES

This section specifies the individuals responsible for the inspections, repairs, and reporting and notifications required for WAG 2, OU 2-13.

9.1 DOE Project Manager

The DOE-ID WAG 2 remediation project manager is responsible for the following:

- Ensuring the O&M activities are performed in accordance with the approved plan
- Coordinating the activities of the INEEL operating contractor at WAG 2, OU 2-13.

9.2 WAG 2, OU 2-13 Contractor Project Manager

As the point of contact for O&M activities, the WAG 2 contractor project manager will be responsible for the following:

- Implementation of inspections using personnel trained to the requirements of the approved plan
- Document control of O&M reports and plans and 5-year review reports, including their placement in the project records file and information repository
- Administration of subcontracts for performing required maintenance
- Submittal of O&M reports to the DOE-ID, EPA, and IDHW/IDEQ
- Providing updated IC and waste site information to the CFLUP coordinator, as required
- Notifying EPA and IDHW/IDEQ of activities inconsistent with land control objectives
- Notifying affected stakeholders (see Section 3.1.4), as required.

10. REFERENCES

- DOE, 1997, *Department of Energy Small Sites: Summary Guide to Closeout Requirements*, U.S. Department of Energy, DOE/EM-0333.
- DOE-ID, 1997a, *Final Record of Decision for Test Reactor Area, Operable Unit 2-13*, U.S. Department of Energy Idaho Operations Office, DOE/ID-10586, December.
- DOE-ID, 1997b, *Comprehensive Remedial Investigation/Feasibility Study for the Test Reactor Area, Operable Unit 2-13, at the Idaho National Engineering and Environmental Laboratory*, U.S. Department of Energy Idaho Operations Office, DOE/ID-10531, February.
- DOE-ID, 1997c, *Idaho National Engineering Laboratory Comprehensive Facility and Land Use Plan*, U.S. Department of Energy Idaho Operations Office, DOE/ID-10514, (website:<http://eris04.inel.gov/>), March.
- DOE-ID, 1998a, *Groundwater Monitoring Plan for the Test Reactor Area, Operable Unit 2-13*, U.S. Department of Energy Idaho Operations Office, DOE/ID-10626, June.
- DOE-ID, 1998b, *Final Comprehensive Remedial Design/Remedial Action Work Plan for the Test Reactor Area*, U.S. Department of Energy Idaho Operations Office, DOE/ID-10643, September.
- EPA, 1999, *Region 10 Final Policy on the Use of Institutional Controls at Federal Facilities*, Memorandum from Director, Office of Environmental Cleanup; Director, Office of Waste and Chemicals Management; Director, Office of Regional Counsel to Office of Environmental Cleanup; Office of Waste and Chemicals Management; Office of Regional Counsel, May.
- INEEL, 1995, *Work Plan for Waste Area Group 2 Operable Unit 2-13 Comprehensive Remedial Investigation/Feasibility Study*, Idaho National Engineering and Environmental Laboratory, INEL-94/0026, April.

Appendix A

Footprint of Groundwater Contamination

1. TRA MCL FOOTPRINT

1.1 R. C. Arnett

12/2/99

I was tasked by Deborah Wiggins and Harry Williams to develop an areal footprint at TRA within which the Snake River Plain Aquifer water would be expected to be above the maximum contaminant limit (MCL) as specified in the Safe Water Drinking Act. This area would remain under institutional control for the near future to prevent withdrawal of contaminated drinking water from the aquifer. During the last decade, only tritium and chromium have exceeded MCLs in the aquifer; therefore only those two contaminants were considered in this assessment.

Tritium and chromium data were obtained from the TRA Environmental Restoration monitoring program and the USGS database. Maximum tritium concentrations have declined during the past two years until no aquifer well samples exceed the MCL of 20,000 pCi/L. Chromium, on the other hand continue to exceed the MCL of 100 ug/L by a substantial margin at wells USGS-065 and TRA-07 and exceeded the MCL at well TRA-08 until the May 1999 sampling round.

For these reasons, chromium was selected to determine the areal extent of the above MCL contaminant footprint. The latest available chromium concentration data from both TRA and USGS monitoring wells were assembled and the well locations plotted on a simple background map. TRA monitoring data were available for May 1999 and USGS monitoring data were available from October 1998 until April 1999. Concentrations below the detection limit were assumed to have a concentration of 2 ug/L. Concentration contours were computed using a simple Kriging algorithm and a grid spacing of 100 x 100 feet. Two estimated concentration points were added to control extrapolation in areas with limited well data. The results of the contouring are shown on Figure A-1 together with well locations, sample concentrations and the TRA background map. Data from well highway-3 was also used in the contouring shown on Figure 1. The location of Highway-3 is beyond the area of Figure 1 and is located where the Big Lost River channel crosses U. S. highway 20. It is used to supply a highway rest stop facility. Aquifer wells close to or within the TRA fence have shown recent concentrations well below the MCL and it is for this reason that the plume is somewhat downgradient (south-west) of the TRA.

A figure was constructed that could be used to produce a GIS style map showing the MCL "footprint." For this final map, the 80 ug/L contour line was selected to provide a degree of conservatism (the chromium MCL is 100 ug/L). Figure 2 represents the map provided to the GIS group.

The location of the wells (particularly TRA-08), the direction of the hydraulic gradient (south-west), and the location of chromium discharge sites (TRA-DISP well for direct disposal to the aquifer and the Warm Waste Ponds as surface receivers in the past) provide reasonable confidence in the position of the "footprint." For the most part, the exceedance wells are surrounded by other monitoring wells, particularly in the direction of the hydraulic gradient. Wells USGS-065 and TRA-07 are shallow skimmer wells and there is evidence that a shallow, semi-stagnant zone exists surrounding those two wells that resists mixing with deeper portions of the aquifer. The contamination in this zone does not appear to be moving downgradient with the regional aquifer flow. Well TRA-06 is located within a few feet of well USGS-065, but is completed 65' deeper. Chromium concentrations in TRA-06 are less than 1/10th the concentrations in USGS-065.

A two-dimensional aquifer model was prepared as part of the remedial investigation that assumed a well-mixed aquifer that flowed to the southwest. This model predicted the maximum future contaminant (including chromium and tritium) concentrations in the aquifer without respect to location. In other words, an areal footprint could not be constructed from the model predictions. The model is documented in Lewis, et al. (1992).

Finally, concentrations in TRA-08 have exceeded MCLs in the past. This analysis assumes that the recent decline is permanent. Continued monitoring of TRA-07, TRA-08, and USGS-065 are planned. If chromium concentrations at TRA-08 again exceed the MCL, some adjustment of the "footprint" may be indicated. Further details about the TRA perched water and aquifer systems can be found in Arnett, et al. (1996).

References:

- Lewis, S.M., P. O. Sinton, M. J. Condran, J. W. Gordon, 1992, *Remedial Investigation Report for the Test Reactor Area Perched Water System (Operable Unit 2-12)*, EGG-WM-10002 Rev. 0, June, prepared for EG&G Idaho, Inc. and the U. S. Department of Energy, Idaho Field Office by Dames and Moore, 1125 Seventeenth Street, Suite 1200, Denver, CO 80202.
- Arnett, R. C., T. R. Meachum, and P. J. Jessmore, 1996, *Post-Record of Decision Monitoring for the Test Reactor Area Perched Water System, Operable Unit 2-12*, INEL-96/0305, prepared for the U. S. Department of Energy by Lockheed Martin Idaho Technologies Company, August, Idaho Falls, Idaho 83415.

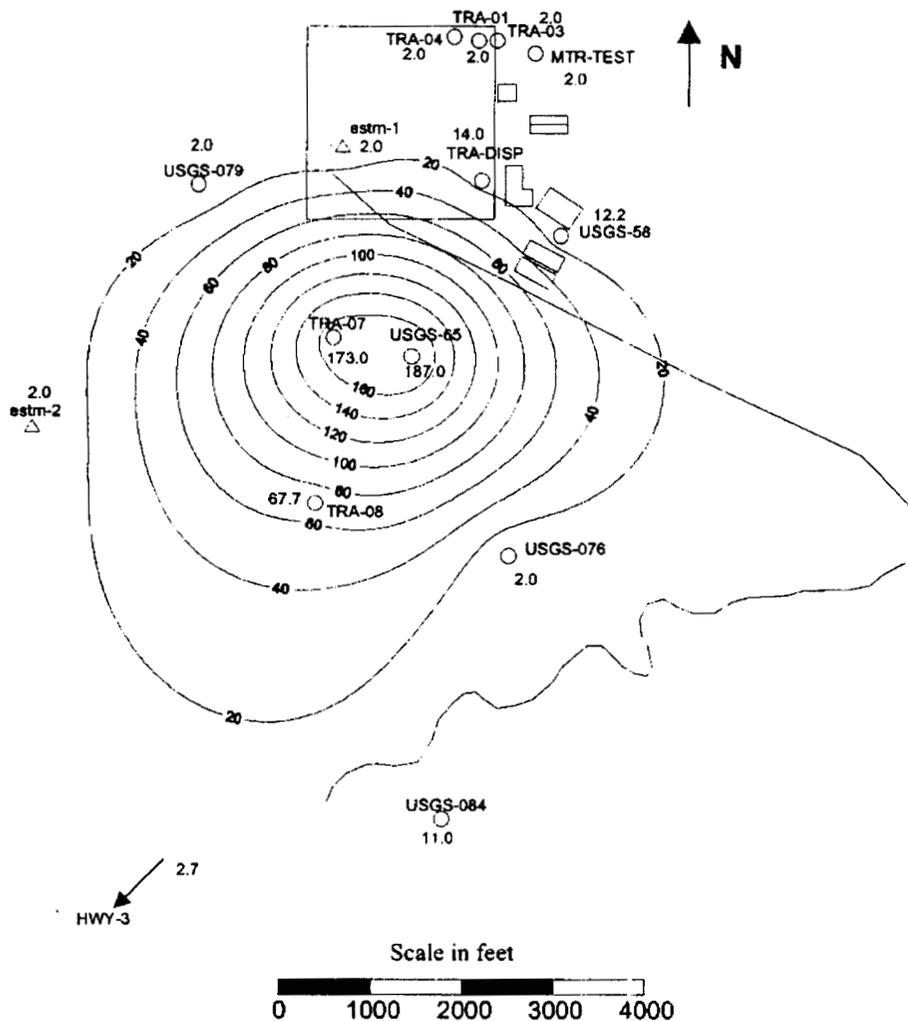


Figure A-1. TRA aquifer concentration contours with well names and sample concentrations (1998-99 samples).

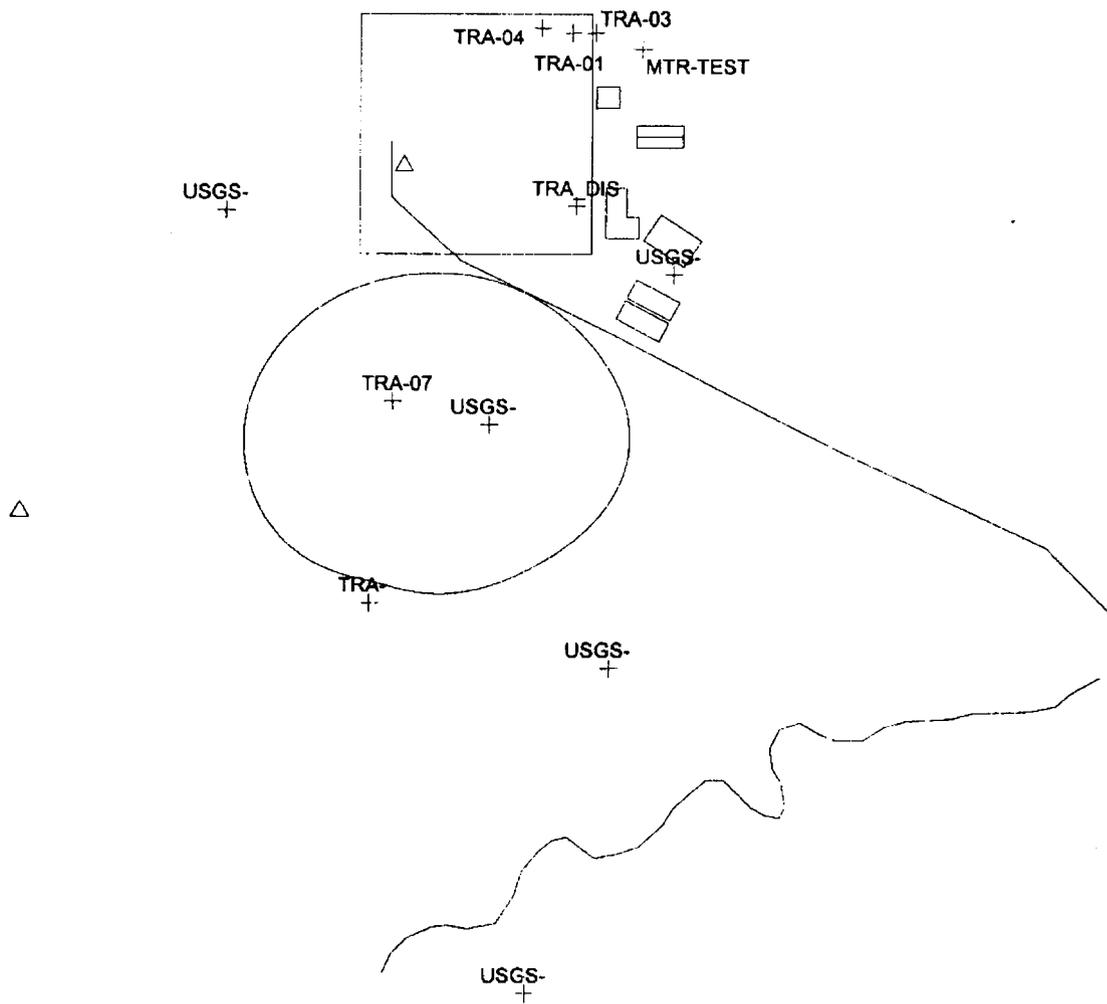


Figure A-2. TRA aquifer chromium "footprint" above MCL (a conservative value of 80 ug/l was used for the contour, rather than the MCL of 100 ug/L)

Appendix B

Waste Site Specific Land Use Controls

Table B-1. Land use control during DOE operations.^{a,b}

Waste Site	Contaminants that Require Institutional Controls ^f (in order of concern)	Protection/ Institutional Control ^d	Depth of contamination	Land Use Control Objectives	Controls
<i>Sites with remedies</i>					
TRA-03 Warm Waste Pond	Cs-137, Eu-152, Co-60, Eu-154, Sr-90, Ag-108m, Am-241, Pu-239/240, Pu-238	1 Engineered containment barrier, institutional controls to limit occupational access until cumulative human health risk is less than 1E-04	1952 cell – 2 ft 1957 cell 7-9 ft 1964 cell – 1 ft at edges	Maintain integrity of engineered cover	<ol style="list-style-type: none"> 1. Visible access restrictions (warning signs, and permanent markers). 2. Control of activities (drilling or excavating). 3. Publish surveyed boundaries and description of controls in INEEL Land Use Plan.
TRA-13 Sewage Leach Pond	Cs-137, Co-60, Ag-108m Eu-152, Eu-154, Cs-134	Native soil containment barrier, institutional controls to limit occupational access until cumulative human health risk is less than 1E-04	14 ft at the location of the original cells	Maintain integrity of native cover	<ol style="list-style-type: none"> 1. Visible access restrictions (warning signs). 2. Control of activities (drilling or excavating). 3. Publish surveyed boundaries and description of controls in INEEL Land Use Plan.

Table B-1. (continued).

Waste Site	Contaminants that Require Institutional Controls ^f (in order of concern)	Protection/ Institutional Control ^d	Depth of contamination	Land Use Control Objectives	Controls
Sewage Leach Pond Soil Contamination Area	Cs-137, Co-60, Ag-108m	Institutional Controls to limit occupational access until cumulative human health risk is less than 1E-04 (approximately 30 years)	Surface	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible Access Restrictions (signs) 2. Control of activities (drilling or excavating)
TRA-15 Soil around hot tanks	Cs-137, Co-60, Cs-134	<p>Institutional Controls to limit occupational access until cumulative human health risk is less than 1E-04 (approximately 100 years for top 10 ft)</p> <p>Limit land use for deep soil (10-40 ft) until evaluated to not be needed</p>	Below surface to 40 ft deep	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible access restrictions (signs) 2. Control of activities (drilling or excavating)

B-2

Table B-1. (continued).

Waste Site	Contaminants that Require Institutional Controls ^f (in order of concern)	Protection/ Institutional Control ^d	Depth of contamination	Land Use Control Objectives	Controls
TRA-19 Soil around tanks	Cs-137 Cs-134, Co-60, Sr-90	Institutional Controls to limit occupational access until soil removed or status is changed.	Below surface	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible access restrictions (signs) 2. Control of activities (drilling or excavating) 3. Notice to affected stakeholders (e.g. BLM, ShoBan Tribal Council, F&W, local county governments, State, and EPA) with regards to any change in land use designation, restriction, or land users.
Brass Cap Area	Cs-137 ,Co-60, Cs-134, Sr-90	Institutional Controls to limit occupational access until soil removed or status is changed.	Below surface	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible access restrictions (signs) 2. Control of activities (drilling or excavating) 3. Notice to affected stakeholders (e.g. BLM, ShoBan Tribal Council, F&W, local county governments, State, and EPA) with regards to any change in land use designation, restriction, or land users.
<i>No action Sites with Institutional Controls</i>					
TRA-04 TRA Warm-Waste Retention Basin, Surficial sediments (TRA-712)	Potential contaminants of concern at depth include arsenic, beryllium, chromium, copper, lead, mercury, selenium, thallium, Co-60, Cs-137, U.234, U-238	Limit land use for 10-40 ft deep until evaluated to not be needed	10-40 ft	Ensure land use is appropriate	Control land use.

Table B-1. (continued).

Waste Site	Contaminants that Require Institutional Controls ^f (in order of concern)	Protection/ Institutional Control ^d	Depth of contamination	Land Use Control Objectives	Controls
Perched and Groundwater	Cr, H-3 ^c	Control groundwater use until MCLs are achieved (approximately 20 years)	50 ft, 150 ft, 480 ft	Prevent consumption and use of water >MCL	1. Activity control procedures. 2. Publish estimated conservative boundaries in INEEL Land Use Plan

a. Source of information is DOE-ID 1998b, INEL 1995, and DOE-ID 1997a.

b. No residential land use is assumed.

c. Potential deep contamination could include acetone, CCL₄, chloroform, 1,4 dichlorobenzene, 2,4 dinitrotoluene, methylene chloride, naphthalene, As, Pb, chloride, fluoride, nitrate, nitrite, orthophosphate, sulfate, Am-241, Co-60, Cs-134, Eu-154, Pu-238, Pu-239/240, Sr-90.

d. Listed timeframes are approximate, based on risk calculations done in the RI/FS. The continued need for institutional controls will be re-evaluated by the Agencies in the 5-year review.

e. Tritium concentrations are not currently above MCLs (see appendix A).

f. Contaminants that contribute to a current occupational cumulative human cancer risk greater than 1E-04 with an individual risk greater than 1E-06, and/or with a current occupational hazard index greater than 1.0.

B-4

Table B-2. Land use control after DOE operations under DOE control.^{a,b}

Waste Site	Contaminants that require institutional controls (in order of concern)	Protection/ Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls During DOE Control After DOE Operations
<i>Sites with remedies</i>					
TRA-03 Warm Waste Pond	Cs-137, Eu-152, Eu-154, Co-60, Sr-90, Au-108m, Am-241, Pu-239/240, Pu-238 ^d	1. Engineered containment barrier institutional controls to limit occupational access until cumulative human health risk is less than 1E-04	1952 cell – 2 ft 1957 cell 7-9 ft 1964 cell – 1 ft at edges	Maintain integrity of engineered cover	1. Visible access restrictions (warning signs, permanent markers). 2. Control of activities (drilling or excavating). 3. Property lease restrictions. 4. Notice to affected stakeholders (e.g. BLM, ShoBan Tribal Council, F&W, local county governments, State, and EPA) with regards to any change in land use designation, restriction, or land users.
TRA-06 Chemical Waste Pond	Hg ^c	Limit Land use	14 ft	Ensure appropriate land use	1. Visible access restrictions (warning signs) 2. Property lease restrictions.
TRA-08 TRA Cold Waste Disposal Pond (TRA-702)	Cs-137, As, Co-60, Eu-154 ^c	Limit land use to Industrial land use until risk is less than 1E-04 (approximately 100 years)	Below surface	Ensure Land use is appropriate	Property lease restrictions.

Table B-2. (continued).

Waste Site	Contaminants that require institutional controls (in order of concern)	Protection/ Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls During DOE Control After DOE Operations
TRA-13 Sewage Leach Pond	Cs-137, Ag-108m, Co-60, Eu-152 ^d	Native soil containment barrier, institutional controls to limit occupational access until cumulative human health risk is less than 1E-04 and prohibit residential development	14 ft at the original cell location	Maintain integrity of native cover	<ol style="list-style-type: none"> 1. Visible access restrictions (warning signs). 2. Control of activities (drilling or excavating). 3. Property lease restrictions. 4. Notice to affected stakeholders (e.g. BLM, ShoBan Tribal Council, F&W, local county governments, State, and EPA) with regards to any change in land use designation, restriction, or land users.
TRA-15 Soil Around Hot Waste Tanks 2,3,4	Cs-137 ^d	Institutional controls to limit access until cumulative human health risk is less than 1E-04 and prohibit residential development. Limit land use for deep soil (10–40 ft) until evaluated to not be needed.	Below surface to 10 ft deep	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible access restrictions 2. Control of activities 3. Property lease restrictions.

B-6

Table B-2. (continued).

Waste Site	Contaminants that require institutional controls (in order of concern)	Protection/ Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls During DOE Control After DOE Operations
TRA-19 Soil Around Rad Tanks 1, 4	Cs-137, Sr-90, Co-60 ^d	Institutional Controls to restrict occupational access and prohibit residential development, until soil is removed or status is changed.	Below surface	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible access restrictions (signs) until soil removed. 2. Control of activities (drilling or excavating) until soil removed. 3. Property lease restrictions until soil removed.
Brass Cap Area	Cs-137, Co-60, Sr-90, Cs-134 ^d	Institutional Controls to restrict occupational access and prohibit residential development until soil is removed or status is changed.	Below surface	Limit direct exposure to radiologically contaminated soils	<ol style="list-style-type: none"> 1. Visible access restrictions (signs) 2. Control of activities (drilling or excavating) 3. Property lease restrictions until soil removed.
<i>No action Sites with Institutional Controls</i>					
Spill at TRA-619	PCBs	Limit land use to Industrial land use	2 ft under concrete pad	Ensure land use is appropriate	Property lease restrictions for industrial use only.
Spills at TRA-626	PCBs	Limit land use to Industrial land use	>4 ft	Ensure land use is appropriate	Property lease restrictions for industrial use only.
Spills at TRA-653	PCBs	Limit land use to Industrial land use	>4 ft	Ensure land use is appropriate	Property lease restrictions for industrial use only.

Table B-2. (continued).

Waste Site	Contaminants that require institutional controls (in order of concern)	Protection/ Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls During DOE Control After DOE Operations
TRA-04 TRA Warm-Waste Retention Basin, Surficial sediments (TRA-712)	Cs-137, As, Be, Co-60, U-238	Limit land use of top 10 ft to Industrial land use until risk is less than 1E-04 (approximately 100 years). Limit land use for 10-40 ft deep until otherwise evaluated	<40 ft	Ensure land use is appropriate	Property lease restrictions, as applicable.
TRA-34 TRA North Storage Area	Ag-108m, Eu-152, Cs-137	Limit land use to industrial land use until risk is less than 1E-04 (approximately 30 years)	Below surface	Ensure land use is appropriate	Property lease restrictions, as applicable.
Hot Tree Site	Cs-137	Limit land use to Industrial land use until risk is less than 1E-04 (approximately 30 years)	6 ft below surface	Ensure land use is appropriate	Property lease restrictions, as applicable .

B-8

Table B-2. (continued).

Waste Site	Contaminants that require institutional controls (in order of concern)	Protection/ Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls During DOE Control After DOE Operations
Perched and Groundwater	Cr, H-3	Control groundwater use until MCLs are achieved (approximately 20 years)	50 ft, 150 ft, 480 ft	Prevent consumption and use of water >MCL	1. Activity control procedures, as applicable. 2. Property lease restrictions, as applicable.

a. Listed timeframes are approximate, based on risk calculations done in RI/FS. The continued need for institutional controls will be re-evaluated by the Agencies in the 5-year review.

b. Source of information is DOE-ID 1998b, INEL 1995, and DOE-ID 1997a.

c. Contaminants that contribute to a calculated 30 year future residential cumulative human cancer risk greater than 1E-04 with an individual risk greater than 1E-06, and/or with a 30 year future residential hazard index greater than 1.0 (30 year future residential land use is the most conservative assumption using available RI/FS risk data).

d. Contaminants that contribute to a calculated 30-year future occupational cumulative human cancer risk greater than 1E-04 with an individual risk greater than 1E-06 and/or with a 30-year future occupational hazard index greater than 1.0.

Table B-3. Land use control after DOE control^{a,b}

Waste Site	Contaminants that prevent unlimited land use ^c (in order of concern)	Protection/Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls After DOE Control
<i>Sites with remedies</i>					
TRA-03B Warm Waste Pond	Cs-137, Pu-239/249, Ag-108m, Am-241, Eu-152, Sr-90, U-238, Pu-238	Land use control to maintain engineered cover	1952 cell – 2 ft 1957 cell 7-9 ft, 1964 cell – 1 ft at edges	Maintain integrity of engineered cover	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b
TRA-06 Chemical Waste Pond	Hg	Limit land use	14 ft	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b
TRA-13 Sewage Leach Pond	Hg, Zn, Ag-108m, Cs-137	Limit land use	14 ft at the location of the original cells	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b
TRA-15 Soil Around Hot Tanks	Cs-137, As	Limit land use until evaluated to not be needed	10 ft to 40 ft	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b
TRA-19 Rad Tanks 1,4	Cs-137, Sr-90	Institutional Controls to restrict occupational access and prohibit residential development until soil is removed or status is changed.	Below surface	Limit direct exposure to radiologically contaminated soils	Property transfer requirements including finding of suitability to transfer and requirements for control of activities consistent with ROD ^b until soil is removed.

B-10

Table B-3. (continued).

Waste Site	Contaminants that prevent unlimited land use ^c (in order of concern)	Protection/Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls After DOE Control
Brass Cap Area	Cs-137, Sr-90	Institutional Controls to restrict occupational access and prohibit residential development until soil removed or status is changed.	Below surface	Limit direct exposure to radiologically contaminated soils	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD ^b until soil is removed.
<i>No Action Sites with institutional controls</i>					
TRA-04 TRA Warm-Waste Retention Basin, Surficial sediments (TRA-712)	Cs-137, As, Be, Co-60, U-238	Limit land use	>10 ft	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b
Spill at TRA-619	PCBs	Limit land use to industrial land use	2 ft Under concrete pad	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b
Spills at TRA-626	PCBs	Limit land use to industrial land use	> 4 ft	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b

B-11

Table B-3. (continued).

Waste Site	Contaminants that prevent unlimited land use ^c (in order of concern)	Protection/Institutional Control	Depth of Contamination	Land Use Control Objectives	Controls After DOE Control
Spills at TRA-653	PCBs	Limit land use to industrial land use	>4 ft	Ensure appropriate land use	Property transfer requirements, including finding of suitability to transfer and requirements for control of activities consistent with ROD. ^b

a. DOE control is assumed to end at 100 years

b. Source of information is DOE-ID 1998b, INEL 1995, and DOE-ID 1997a.

c. Contaminants that contribute to a calculated 100 year future residential cumulative human cancer risk greater than 1E-04 with an individual risk greater than 1E-06, and/or with a 100 year future residential hazard index greater than 1.0 .

Appendix C

Inspection Report Forms for TRA OU 2-13 Native Soil and Engineered Covers

**INSPECTION REPORT FORM FOR REMEDIATED SITES
TRA WARM WASTE POND, AS REQUIRED BY OU 2-13 OPERATION AND MAINTENANCE PLAN**

Annual Inspection of Warm Waste Pond

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSPECTION DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for nongrowth areas.			
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
RIPRAP BARRIER			
1. Inspect for erosion areas.			
2. Inspect for subsidence areas.			
3. Inspect for biological intrusion.			
4. Inspect for effectiveness of surface water runoff.			
PERIMETER OF RIPRAP BARRIER			
1. Perform perimeter surface radiological survey.			

Printed Name of Inspector _____

Photographs Taken Yes No

Qualification/Title _____

C-1

**INSPECTION REPORT FORM
TRA CHEMICAL WASTE POND, AS REQUIRED BY OU 2-13 OPERATION AND MAINTENANCE PLAN**

Annual Inspection of Chemical Waste Pond Cover

INSPECTION ACTIVITY	INSPECTOR'S SIGNATURE	INSPECTION DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for nongrowth areas.			
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
NATIVE SOIL COVER			
1. Inspect for erosion areas.			
2. Inspect for animal intrusion.			
3. Inspect for subsidence areas.			
4. Inspect for effectiveness of surface water runoff.			

02

Printed Name of Inspector _____

Photographs Taken Yes No

Qualification/Title _____

INSPECTION REPORT FORM
TRA SEWAGE LEACH POND, AS REQUIRED BY OU 2-13 OPERATION AND MAINTENANCE PLAN
 Annual Inspection of Sewage Leach Pond Cover

INSPECTION ACTIVITY	INSPECTOR'S SIGNATURE	INSPECTION DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for nongrowth areas.			
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
NATIVE SOIL COVER			
1. Inspect for erosion areas.			
2. Inspect for animal intrusion.			
3. Inspect for subsidence areas.			
4. Inspect for effectiveness of surface water runoff.			
PERIMETER OF SOIL COVER			
1. Perform surface radiological survey.			

Printed Name of Inspector _____

Photographs Taken Yes No

Qualification/Title _____

C-3

**INSPECTION REPORT FORM
 TRA SEWAGE LEACH POND AND SOIL CONTAMINATION AREA, AS REQUIRED
 BY OU 2-13 OPERATION AND MAINTENANCE PLAN**

Annual Inspection of Soil Contamination Area

INSPECTION ACTIVITY	INSPECTOR'S SIGNATURE	INSPECTION DATE	COMMENTS/RECOMMENDED REPAIR
INSTITUTIONAL CONTROLS			
1. Perform surface radiation surveys.			

Printed Name of Inspector _____

Photographs Taken Yes No

Qualification/Title _____

Appendix D

Inspection Form for Institutional Controls

WAG 2 OU 2-13 Inspection Form for Institutional Controls at a Waste Site

DATE/TIME: _____

INSPECTOR:

Printed Name	Title	Organization
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INSPECTOR:

Printed Name	Title	Organization
---------------------	--------------	---------------------

1. WASTE SITE ID: _____

2. GROUP NUMBER (if applicable): _____

3. SITE DESCRIPTION:

4. ROD LAND USE: _____

5. CURRENT LAND USE: _____

6. CHECK THE INSTITUTIONAL CONTROLS REQUIRED FOR THE SITE:

- a. Visible Access Restrictions:
- b. Warning Signs _____
- c. Fencing _____
- d. Control of Activities _____
- e. Comprehensive Land Use Plan _____
- f. Property lease or transfer restrictions _____
- g. Notice to affected stakeholders _____

7. CHECK THE INSTITUTIONAL CONTROLS OBSERVED FOR THE SITE:
- a. Visible Access Restrictions:
 - b. Warning Signs _____
 - c. Fencing _____
 - d. Control of Activities _____
 - e. Comprehensive Land Use Plan _____
 - f. Property lease or transfer restrictions _____
 - g. Notice to affected stakeholders (if applicable) _____
8. ARE THE INSTITUTIONAL CONTROLS OPERATIONAL AND FUNCTIONAL?
YES _____ NO _____
9. ARE SURVEYED MAPS OF THE SITE AVAILABE? YES _____ NO _____
Provide Map Number(s) _____
10. PHOTO NUMBERS: Take photographs of each site, identify the date, time, location and compass orientation of each photograph in the attached photographic log.

COMMENTS:

11. PROVIDE THE CURRENT STATUS OF ANY REMEDIAL ACTIONS AT THE SITE (e.g., remedial design, construction, O&M): _____
12. IS THERE ANY EVIDENCE OF HUMAN INTRUSION (i.e., excavation marks, changes in features of original cover)? _____
EXPLAIN _____
13. DO WARNING SIGNS CLEARLY IDENTIFY A HAZARD?
EXPLAIN _____
14. ARE WARNING SIGNS VISIBLE FROM ALL AVENUES OF APPROACH TO THE INSTITUTIONAL CONTROL CONTROLLED AREA? _____ EXPLAIN

15. ARE REQUIRED SIGNS INTACT AND READABLE? _____ EXPLAIN

DEFICIENCIES:

PROVIDE A DESCRIPTION OF ANY DEFICIENCIES AND THE EFFORTS OR MEASURES THAT HAVE BEEN OR WILL BE TAKEN TO CORRECT PROBLEMS:

IMPROVEMENTS:

DESCRIBE ANY ADDITIONAL INSTITUTIONAL CONTROL REQUIREMENTS THAT MAY BE NECESSARY DUE TO UNIQUE CIRCUMSTANCES OBSERVED DURING THE VISUAL INSPECTION:

I certify that the above inspection report is true and accurate to the best of my ability.

Inspector signature

Date

Inspector signature

Date

SITE INSPECTION PHOTO NUMBER LOG

WASTE SITE ID: _____ GROUP NUMBER: _____

DATE: _____ TIME OF DAY(if applicable): _____

WEATHER CONDITIONS: _____

ROLL NUMBER: _____ FILM TYPE: _____

NUMBER OF EXPOSURES: _____

PHOTO NUMBER	LOCATION AND DIRECTION	DESCRIPTION

Appendix E

Monitoring Report Forms for Institutional Controls

Institutional Controls Monitoring Report

DATE OF
INSPECTION:

1st INSPECTOR: _____ TITLE: _____

ORGANIZATION: _____ TELEPHONE: _____

2nd INSPECTOR: _____ TITLE: _____

ORGANIZATION: _____ TELEPHONE: _____

GENERAL OU DESCRIPTION AND OPERATIONAL HISTORY: Provide a brief description of the operable unit and its operational history since the last monitoring inspection (or ROD signature if the first inspection). Summarize the ROD's institutional controls and land use assumptions. Take photographs of each site, identify the date, time, location, and compass orientation of each photograph in a photographic log. Also, provide a brief description of how INEEL is meeting the facility-wide institutional control requirements (use additional sheets as necessary).

GENERAL QUESTIONS

1. Has INEEL developed a comprehensive facility-wide approach for establishing, implementing, enforcing, and monitoring institutional controls at the facility. This approach will frequently include a Base Master Plan or a facility-wide land use plan, installation maps, a comprehensive permitting system, and other installation policies and orders.

The INEEL Comprehensive Facilities and Land Use Plan (CFLUP) is used to track land use and includes installation maps. Internal procedures control work and land use.

2. Does the CFLUP (or equivalent) list all areas or locations covered by the OU 2-13 ROD that has institutional controls for protection of human health or the environment?

The CFLUP lists all the areas in the OU 2-13 ROD that have institutional controls for protection of human health or the environment.

3. Do the applicable company work control procedures describe how and what entities and persons are covered by the Institutional Controls? If yes, list who is covered (e.g., contractors, employees, invitees) and describe the nature of the coverage.

4. Do procedures that control activities at the waste site address the following activities: future soil disturbance, routine and non-routine utility work, well placement and drilling, recreational activities, groundwater withdrawals, paving, training activities, construction, renovation work on structures; or other activities? Describe by type of site.

5. Describe how the CFLUP serves as a tracking mechanism that identifies all land areas under restriction or control.

6. Describe the process that is in place to promptly notify both EPA and the state prior to any anticipated change in land use designation, restriction, land users or activity for any institutional control required by a decision document. If yes, please describe.

7. Has INEEL designated a point of contact for implementing, maintaining, and monitoring institutional controls? If yes, provide name, title and phone number?

8. Has DOE-ID obtained sufficient funding to institute and maintain institutional controls pursuant to Paragraph 28 of the Federal Facility Agreement and Consent Order? If no, describe what steps were taken to obtain sufficient funding.

9. Has INEEL deleted or terminated any institutional control? If so describe the circumstances to include how the state and EPA were involved in the decision.

10. Has INEEL transferred, sold or leased any property subject to institutional controls in OU 2-13? If yes, please describe to include dates of notification to state and EPA.

11. Has INEEL transferred, sold or leased any other property? If yes, please describe to include dates of notification to state and EPA.

12. Does INEEL have any plans in the next year to transfer, sell, or lease any properties?

DEFICIENCIES:

Provide a description of any deficiencies and the efforts or measures that have been or will be taken to correct problems.

IMPROVEMENTS:

Describe any additional institutional control requirements that may be necessary due to unique circumstances observed during the visual inspection?

SITE # TRA #	ROD Land Use ^b	Current Land Use	Required Institutional Control [WS, CFLUP, P, L, W] ^c	Observed Institutional Controls [WS, CFLUP, P, L, W] ^c	ICs O&F ^d [Y/N] ^d	Photo Numbers	Visual Inspection Comments
03 & SCA							
06							
08							
13							
15							
19							
Brass Cap Area							
619							
626							
653							
04							
34							
Hot tree site							
Groundwater							

a. See OU 2-13 ROD, or subsequent decision document for site description. Does not include "No Action" sites

b. Describe land use, unrestricted (U), structures-industrial (SI), zoned industrial (ZI), grazing (G), radiologically controlled (RC), etc. Explain in comments.

c. WS = warning signs, CFLUP = INEEL Comprehensive Facility Land Use Plan, NA = no action, P = property transfer restrictions, L = lease restrictions, W = well drilling restrictions

O&F = Is the institutional control required in ROD operational and functional (e.g., signs posted).

Appendix F

Calculations for Current Residential Risk

Table F-1. Calculations for residential risk.

		TRA-04 human cancer risk	TRA-34 human cancer risk	Hot Tree Site human cancer risk
Acrylonitrile	100 yr Future	5.E-05	1.E-06	1.E-06
	30 yr Future	5.E-05	1.E-06	1.E-06
	Current	5.E-05	1.E-06	1.E-06
Arsenic	100 yr Future	3.E-05	---	---
	30 yr Future	3.E-05	---	---
	Current	3.E-05	---	---
Beryllium	100 yr Future	1E-05	---	---
	30 yr Future	1.E-05	---	---
	Current	1.E-05	---	---
Ag-108m	100 yr Future	5.E-10	3.E-05	6.E-12
	30 yr Future	6.E-10	4.E-05	7.E-12
	Current	9.E-10	5.E-05	1.E-11
Am-241	100 yr Future	3.E-15	3.E-15	3.E-15
	30 yr Future	3.E-15	3.E-15	3.E-15
	Current	7.E-16	7.E-16	7.E-16
Co-60	100 yr Future	5.E-10	4.E-11	5.E-11
	30 yr Future	5.E-06	4.E-07	5.E-07
	Current	3.E-04	2.E-05	2.E-05
Cs-134	100 yr Future	---	---	---
	30 yr Future	---	---	---
	Current	---	---	---
Cs-137	100 yr Future	1.E-05	5.E-06	2.E-05
	30 yr Future	5.E-05	1.E-05	1.E-04
	Current	1.E-04	5.E-05	2.E-04

Table F-1. (continued).

		TRA-04 human cancer risk	TRA-34 human cancer risk	Hot Tree Site human cancer risk
Eu-152	100 yr Future	---	5.E-07	---
	30 yr Future	---	2.E-05	---
	Current	---	9.E-05	---
Eu-154	100 yr Future	---	---	---
	30 yr Future	---	---	---
	Current	---	---	---
Pu-239	100 yr Future			
	30 yr Future			
	Current			
Sr-90	100 yr Future	2.E-09	2.E-08	3.E-08
	30 yr Future	4.E-09	3.E-08	8.E-08
	Current	4.E-09	2.E-07	3.E-07
U-234	100 yr Future	8.E-08	---	---
	30 yr Future	8.E-08	---	---
	Current	8.E-08	---	---
U-238	100 yr Future	2.E-06	---	---
	30 yr Future	2.E-06	---	---
	Current	2.E-06	---	---
Total Risks	100 yr Future	1.02E-04	3.65E-05	2.10E-05
	30 yr Future	1.52E-04	6.67E-05	1.02E-04
	Current	4.55E-04	2.12E-04	2.20E-04

Appendix G

Example of Procedures for Activity and Access Control

Appendix G

EXAMPLE OF PROCEDURE WHICH CONTROLS ACTIVITIES AT CERCLA WASTE SITES

