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MAR 25 1996

ENTERED

Mr. Benito Garcia
New Mexico Environment Department
Hazardous & Radioactive Materials Bureau
2044 A. Galisteo Street
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Dear Mr. Garcia:

Enclosed please find two copies of Data Summary Report No. 3 for Solid Waste Management Units (SWMUs) at the Waste Isolation Pilot Plant (WIPP). This report describes the results of voluntary release assessment sampling at SWMUs 001h, 001l, 001s, and 003a described in the Voluntary Release Assessment/Corrective Action Work Plan (DOE/WIPP draft 2115) submitted to the Environmental Protection Agency (EPA) and NMED on August 1, 1995. The voluntary release assessment program was developed to provide the additional data needed to evaluate potential releases from SWMUs at the WIPP, and describe possible corrective actions at these sites. Data generated as part of this sampling program are intended to update the RCRA Facility Assessment (RFA) for the WIPP (Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant), NMED/DOE/AIP 94/1.

This summary report is the last of three reports submitted to the NMED Hazardous and Radioactive Materials Bureau and EPA Region VI Federal Facilities Section. The schedule for distribution of these reports was designed to provide all voluntary assessment data to the agencies prior to the issuance of the Part B permit for public review and comment.

We look forward to meeting with you, your staff, and personnel from the EPA Federal Facilities Section to discuss the results of the voluntary release assessment program, and the DOE's proposed corrective actions. If you have any questions regarding this Data Summary Report, or if you require any additional information, please contact Mr. Craig Snider at (505)234-7452, or Mr. D. C. Robertson at (505)234-8240.

Sincerely,

E K Hunter

E. Kent Hunter, Assistant Manager
Office of National TRU Waste Operations

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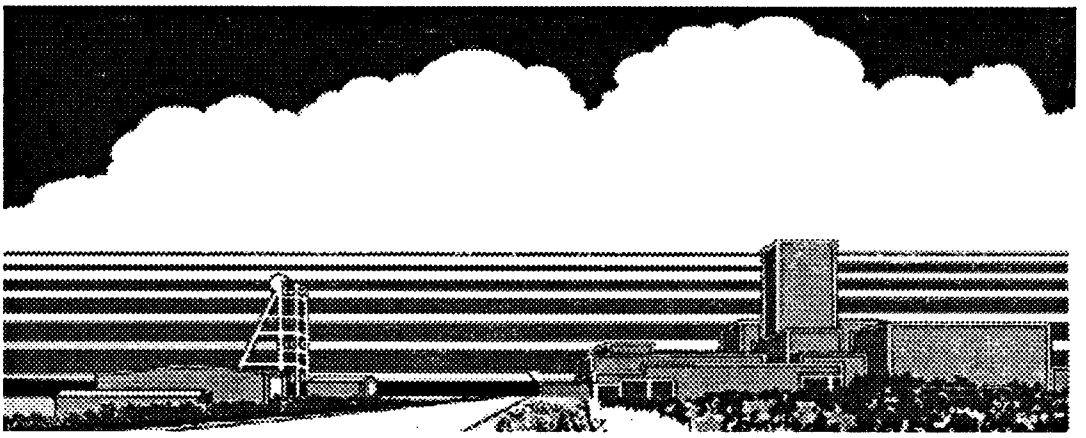
WIPP Library

Data Summary Report No. 3 for Solid Waste Management Units

001h, 001L, 001s, and 003a

At the Waste Isolation Pilot Plant



Supplement to DOE/WIPP Draft - 2115

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EXECUTIVE SUMMARY

The U.S. Department of Energy, Carlsbad Area Office (DOE-CAO) has completed a voluntary release assessment sampling program at selected Solid Waste Management Units (SWMUs) at the Waste Isolation Pilot Plant (WIPP). This release assessment data summary report is the third of three reports to be submitted to the EPA Region VI, Hazardous Waste Management Division and the NMED Hazardous and Radioactive Materials Bureau to describe the results of voluntary release assessment sampling and identify proposed corrective actions.

The voluntary release assessment/corrective action program is intended to be the first phase in implementing the RCRA Facility Investigation (RFI) corrective action process at the WIPP. Data generated as part of this sampling program are intended to update the RCRA Facility Assessment (RFA) for the WIPP (*Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant), NMED/DOE/AIP 94/1*. This Release Assessment Data Summary Report documents the results of release assessment sampling at SWMU 001h, 001L, 001s, and 003a. Additionally, this report will provide further information on the request for No Further Action at the Brinderson and Construction Landfills (SWMUs 002a and 002b respectively). This additional information includes a letter from the Bureau of Land Management discussing the inspections at these locations and operating logs for the landfills from 1989 to present. These results are provided to document voluntary release assessment/corrective action commitments contained in the *Voluntary Release Assessment/Corrective Action Work Plan (DOE/WIPP Draft 2115)* submitted to the EPA and NMED in August, 1995.

A total of 98 release assessment samples were collected to determine if a release had occurred from any of the six SWMUs discussed in this data summary report. Based on the criteria provided in proposed *40 CFR § 264.514 FR Vol. 55, No. 145, VI(D), p. 30813*, and the October 1995, *EPA Region III Risk-Based Concentration Table, July - December 1995*. EPA Region III Office of RCRA Technical & Program Support Branch (3HW70), the analytical data collected at SWMUs 001h, 001L, 001s, 003a, 002a and 002b demonstrates that no release of hazardous constituents has occurred. Thus, there is no potential for impacts to human health or the environment.

Based on the results of voluntary release assessment sampling and information provided by the BLM and NMED, the DOE-CAO formally requests that a determination of No Further Action be granted for SWMUs 001h, 001L, 001s, 003a and SWMUs 002a and 002b. Because it is the EPA's intent to encourage voluntary corrective actions as described in the preamble of the Proposed Subpart S Rule, the DOE requests that after appropriate public review and agency approval, a No Further Action determination be granted for the six SWMUs described in this Data Summary Report prior to the issuance of the RCRA Part B Permit for the WIPP. Any delay in the issuance of No Further Action determination may require the DOE to submit a Class III permit modification to remove these SWMUs from the list of sites requiring evaluation under

the RFI process. The submittal of a Class III permit modification to remove sites with no potential to impact human health or the environment represents an unreasonable expense. If a No Further Action determination is supported by both the EPA and NMED, these sites will be replanted with native vegetation, in accordance with the *WIPP Land Management Plan (DOE WIPP 93-004)* guidelines.

DATA SUMMARY REPORT FOR SOLID WASTE MANAGEMENT UNITS 001H, 001L, 001S, 003A, 002A AND 002B

1.0 INTRODUCTION

The U.S. Department of Energy, Carlsbad Area Office (DOE-CAO) has completed a voluntary Release Assessment sampling program at selected Solid Waste Management Units (SWMUs) at the Waste Isolation Pilot Plant (WIPP). The DOE-CAO, is the Owner and Operator of the WIPP. Westinghouse Electric Corporation, Waste Isolation Division (WID) is the Co-Operator at the site. For the purpose of clarity, any reference to the DOE throughout this release assessment data summary report implies both the DOE-CAO and Westinghouse-WID.

The voluntary release assessment/corrective action program is intended to be the first phase in implementing the RCRA Facility Investigation (RFI) corrective action process at the WIPP. Data generated as part of this sampling program are intended to update the RCRA Facility Assessment (RFA) for the WIPP (*Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant), NMED/DOE/AIP 94/1*. This Release Assessment Data Summary Report is the third of three reports that will be submitted to the Environmental Protection Agency (EPA) Region VI, Hazardous Waste Management Division and the New Mexico Environment Department (NMED) Hazardous and Radioactive Materials Bureau to describe the results of release assessment sampling and to identify proposed corrective actions. Throughout the balance of this Release Assessment Data Summary report, the acronym EPA will be used for any further reference to the EPA Region VI Hazardous Waste Management Division, and the acronym NMED will be used to reference the NMED Hazardous and Radioactive Materials Bureau.

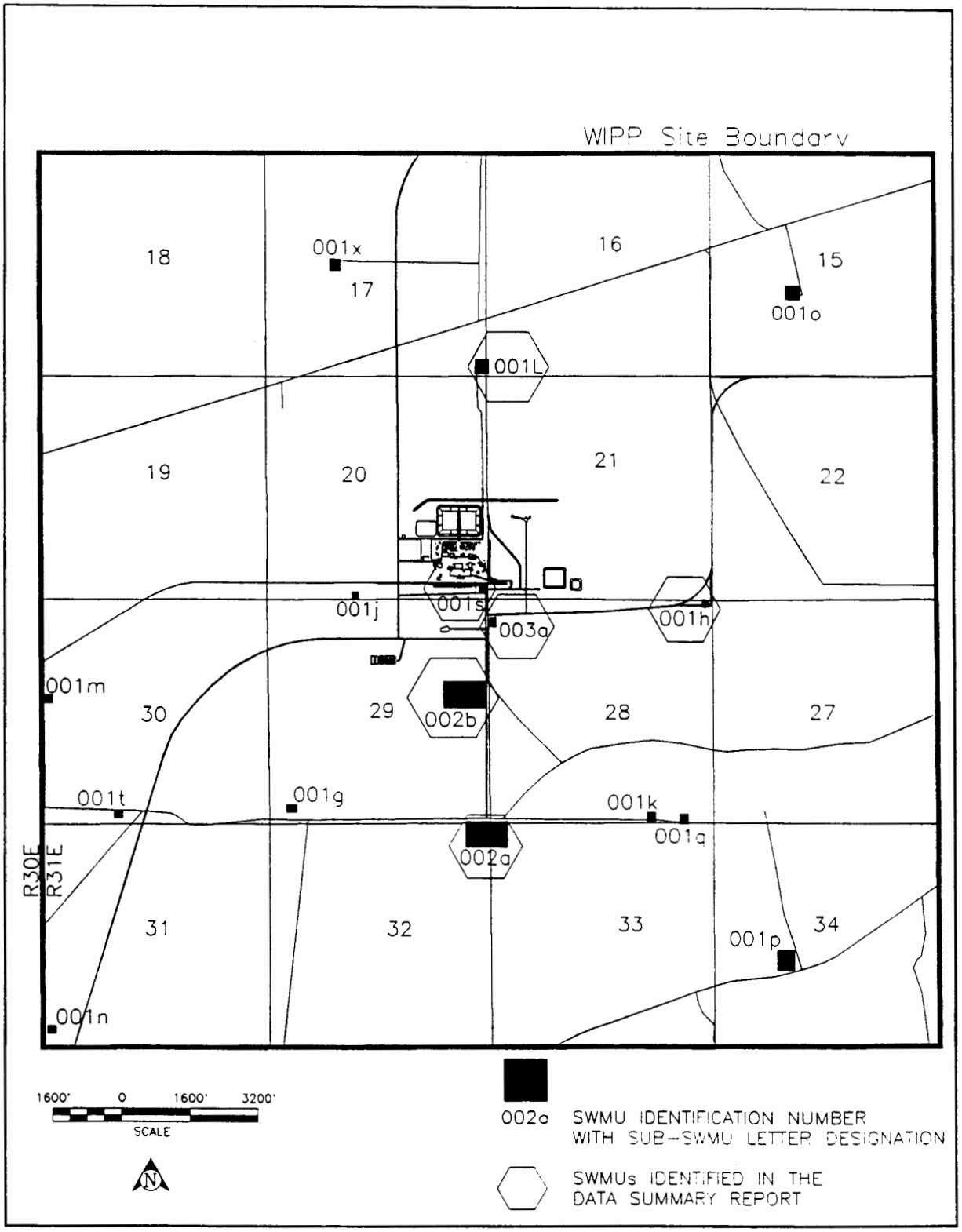
1.1 Scope of the Release Assessment Data Summary Report

This Release Assessment Data Summary Report documents the results of release assessment sampling at SWMU 001h (mudpits H-15 and P-2), SWMU 001L (P-5 and WIPP-12), SWMU 001s (mudpit ERDA-9) and SWMU 003a (the Portacamp Area). To reduce repetition, information regarding sampling requirements, regional geology, and data quality assurance which are shared by all four SWMUs are provided in the introduction section of this report. Release Assessment Data, as well as historical data, are being used to evaluate and develop appropriate voluntary corrective actions required for each SWMU. The results of facility investigations and other analyses will be used to focus on plausible concerns and expedite cleanup decisions as defined in the preamble of the Proposed Subpart S Rule, *Federal Register, Vol. 55, No. 145; July 27, 1990; 308033.*

The *Voluntary Release Assessment/Corrective Action Work Plan (DOE/WIPP Draft 2115)* is the document developed by the DOE to describe the voluntary release assessment sampling protocols and proposed corrective actions at the 16 SWMUs identified in Chapter J of the

draft RCRA Part B Permit Application. The relative location of the 16 SWMUs at the WIPP is provided in Figure 1. In the July 1995, *Release Assessment/Corrective Action Work Plan*, the DOE committed to completing release assessment sampling at 11 SWMUs, initiating corrective actions at 3 SWMUs, and requesting a formal determination of No Further Action at the 2 remaining SWMUs.

Figure 1
Location of SWMUs Identified in WIPP Release Assessment/Corrective Action Plan



Voluntary Release Assessment Sampling has been completed, and a request for a formal determination for No Further Action has been submitted for at the following SWMUs:

SWMU 001g (H-14/P-1 Drill Pad)
SWMU 001h (H-15/P-2 Drill Pad)
SWMU 001j (P-3 mud pit)
SWMU 001k (P-4 Drill Pad)
SWMU 001L (WIPP-12/P-5 Drill Pad)
SWMU 001m (P-6 Drill Pad)
SWMU 001n (P-15 Drill Pad)
SWMU 001s (ERDA 9 Drill Pad)
SWMU 001t (IMC 374 Drill Pad)
SWMU 001x (WIPP-13 Drill Pad)
SWMU 003a (Portacamp Storage Area) (formerly 004a)

Voluntary Corrective Actions have been proposed at the following SWMUs:

SWMU 001o (Badger Unit Drill Pad)
SWMU 001p (Cotton Baby Drill Pad)
SWMU 001q (DOE -1 Drill Pad)

A request for a formal determination for No Further Action has been submitted for the followings SWMUs:

SWMU 002a (Brinderson Landfill) (formerly 003a)
SWMU 002b (Construction Landfill) (formerly 003b)

As described in Data Summary Report No. 1, meetings were held with EPA and NMED personnel in February, August, and September 1995, to review the proposed *Release Assessment/Corrective Action Work Plan* and to obtain approval of sampling protocols. Data quality objectives for the release assessment sampling program were reviewed and verbally approved by both EPA and NMED personnel prior to completing SWMU sampling. The EPA subsequently provided written approval of the sampling protocols used in a December 19, 1995, letter that contained formal review and comment of the July 1995, *Release Assessment/Corrective Action Work Plan.*

A detailed description of sampling methods and quality assurance protocols used to complete assessment sampling are described in the work plan. Sampling personnel utilized the sampling and analytical protocols that are described in the *WIPP Site Effluent and Hazardous Materials Sampling Plan*, WP02-EM2, Rev. 0. WP02-EM2 was developed to meet the sampling and analytical protocols defined in *Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, SW-846.*

Release assessment sample and data quality assurance requirements are defined in the *Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling*, WP02-EM1, Rev.0. Agency and DOE personnel discussed the implementation of Data Quality Objectives, including data quality evaluations, and release assessment plan modifications. Potential corrective actions were discussed, in accordance with the *Guidance for the Data Quality Objectives Process, EPA QA/G-4*, September, 1994.

Guidance for establishing sample locations at each SWMU is contained in the *RCRA Facility Investigation (RFI) Guidance, Development of an RFI Work Plan and General Considerations for RCRA Facility Investigations (Vol. 1)*, EPA 530/SW-89-031, May 1989. The DOE utilized a Judgmental Sampling method to characterize each SWMU. The methodology was selected because site layout or unit characteristics, such as mudpit locations, indicated areas where the probability for contamination would be greatest. As part of the assessment sampling program review meetings, EPA, NMED, and DOE staff evaluated proposed sampling locations and approved the DOE's proposal to limit the first round of RFI release assessment samples to soils media. This determination was based on discussions in the RFA which state that soil is the only media that has the potential to be impacted by releases at individual SWMUs.

1.2 Rationale for the Selection of Target Analytes at SWMU Mudpits 001h, 001L, and 001s

Material Safety Data Sheets (MSDS) have been reviewed to determine potential drilling additives and other products that may have been used to drill the boreholes at each of these three SWMUs. It was assumed that these constituents were subsequently discharged into the mudpits at SWMU 001h, SWMU 001L, and SWMU 001s. Information contained in the RFA, as well as drill logs and geologic reports, were also used to establish the following list of potential wastes streams:

1. attapulgite drill gel (salt bentonite gel)
2. bentonite gel
3. diesel fuel
4. gear grease/gear lubricants
5. hydraulic fluids
6. hydrochloric acid (20% solution)
7. lignite
8. meta-trifluorobenzoic acid
9. metal cuttings
10. motor oil
11. portland cement
12. sodium and potassium chloride saturated brine
13. starch
14. soda ash
15. sodium hydroxide (NaOH)

Based on the review of MSDS for each of these potential waste streams, the DOE developed and the agencies approved, a list of target analytes for all mudpits evaluated in the original release assessment work plan. Because drilling additives, such as drill mud, gear lubricants, and diesel fuel, have a limited potential to generate hazardous constituents, the list of target analytes has been limited. A list of target analytes used in release assessment sampling at SWMUs 001h, 001L, and 001s is provided in Table 1.

TABLE 1
LIST OF TARGET ANALYTES USED IN RELEASE ASSESSMENT SAMPLING AT SWMUS 001H, 001L, AND 001S

PARAMETER	EPA ANALYTICAL METHOD (or equivalent)
Inorganic Analytes	
Arsenic	6010
Barium	6010
Cadmium	6010
Chromium	6010
Lead	6010
Mercury	7470/7471
Thallium	6010
Organic Analytes	
Benzene	8240/8260
Chloroform	8240/8260
1,2-Dichloroethane	8240/8260
Ethylbenzene	8240/8260
Toluene	8240/8260
1,1,1-Trichloroethane	8240/8260
Vinyl Chloride	8240/8260
Xylenes	8240/8260

1.3 Rationale for Selection of Target Analytes for the Portacamp Area

Because both nonhazardous and hazardous materials and wastes have been historically stored in the Portacamp area, a broad range of target analytes have been selected for samples that will be collected at the Portacamp storage areas. The list of target analytes for both the Westinghouse and Sandia Portacamp Areas is provided in Table 2.

TABLE 2

TARGET ANALYTES AND PROPOSED EPA ANALYTICAL METHODS FOR CHARACTERIZING THE PORTACAMP STORAGE AREAS SWMU 003a

Parameter	EPA Analytical Method (or equivalent)
Arsenic***	6010
Barium***	6010
Cadmium***	6010
Chromium***	6010
Lead***	6010
Mercury***	7470/7471
Nickel***	6010
Selenium***	6010
Silver***	6010
Thallium***	6010
Acetone*	8240/8260
Benzene*	8240/8260
Bromoform*	8240/8260
n-Butyl alcohol*	8260
Carbon tetrachloride*	8240/8260
Chlorobenzene*	8240/8260
Chloroform*	8240/8260
Cresols	8040/8270
Cyclohexane*	8240/8260

Parameter	EPA Analytical Method (or equivalent)
Cyclohexanone	8240/8260
o-Dichlorobenzene*	8260/8270
p-Dichlorobenzene*	8260/8270
1,1-Dichloroethane*	8240/8260
1,2-Dichloroethane*	8240/8260
1,1-Dichloroethene*	8240/8260
cis-1,2-Dichloroethene*	8240/8260
2,4-Dinitrotoluene**	8250/8270
2-Ethoxyethanol*	8240/8260/8015 (mod.)
Ethyl acetate*	8240/8260
Ethylbenzene*	8240/8260
Hexachloroethane**	8250/8270
Isobutanol*	8240/8260/8015 (mod.)
Methanol*	8240/8260/8015 (Mod.)
Methylene Chloride*	8240/8260
Methyl Ethyl Ketone*	8240/8260
4-Methyl-2-pentanone*	8240/8260
Nitrobenzene**	8250/8270
Polychlorinated biphenyls(PCB)	8080/8081
Pyridine**	8250/8270
1,1,2,2-Tetrachloroethane*	8240/8260
Tetrachloroethylene*	8240/8260

TABLE 3
(Continued)

TARGET ANALYTES AND PROPOSED EPA ANALYTICAL METHODS FOR CHARACTERIZING THE PORTACAMP STORAGE AREAS

Parameter	EPA Analytical Method (or equivalent)
Toluene*	8240/8260
1,1,1-Trichloroethane*	8240/8260
1,1,2-Trichloroethane*	8240/8260
Trichloroethylene*	8240/8260
Trichlorofluoromethane*	8240/8260
1,1,2-Trichloro-1,2,2-trifluoroethane*	8240/8260
Vinyl chloride*	8240/8260
Xylenes*	8240/8260

* - Volatile, ** - Semivolatile, *** - Metal

1.4 Geology and Hydrogeology in the Vicinity of the WIPP

The geology at the WIPP is characterized by four primary stratigraphic units or regions. The first region includes a near-surface region of Holocene surface deposits, the Mescalero Caliche Formation, and the Gatuna and Dockum Formations. The second region is the Dewey Lake Red Beds. The third region is the Rustler Formation, which is made up of five individual stratigraphic formations. The fourth region is the uppermost part of the Salado Formation.

Because the uppermost strata are the only zones likely to be influenced by any potential release from SWMUs at the WIPP, a brief description of the regional geology and individual surface strata are the only formations discussed in this data summary report. The determination to examine only the near-surface geology at each SWMU site is based on information contained in Section 4.0 of the WIPP RFA. In Section 4.0 of the RFA, the NMED described the potential for a release to groundwater sources in the vicinity of SWMUs 001h, 001L, 001s, and 003a as low. This determination is based on the depth to groundwater and the relative low permeability of the Dewey Lake Formation, the most shallow potential water bearing zone at each of these SWMU sites. A detailed description of the geology and hydrogeology at the WIPP is contained in Chapter D of the *WIPP RCRA Part B Permit Application*, Chapter 2 of the *No-Migration Variance Petition for the Waste Isolation Pilot Plant* (DOE-CAO-95-2043), and Section 3.3 of the *WIPP RFA*.

1.4.1 Surface Formations

The uppermost stratigraphic formations are made up of Quaternary and Triassic-age surface and near-surface strata. These formations consists of Holocene surface deposits, the Mescalero Caliche Formation, and the Gatuna and Dockum group of formations. The uppermost formation consists of fine-to-medium-grained Eolian sands of the Holocene Age that are typically 10-14 feet thick. Soil development is poor, and the overall permeability in this unit is high.

The Mescalero Caliche underlies surface dune sands. Sands and gravels in the Mescalero Caliche are characteristically well cemented with a chalky-to-finely-crystalline matrix of calcium carbonate. The caliche is invoked as a continuous, impermeable barrier over much of the site, however, the Mescalero Caliche may be locally thin or absent. The Gatuna formation occurs as a discontinuous deposit of friable, poorly sorted, pale, reddish brown silty sandstone, with localized mudstone and gravelly beds. The rock generally occurs as the most shallow formation on the western side of the WIPP site, where the thickness and distribution of the formation is variable and erratic. Representative thicknesses at the site range from 10-32 feet. Measurements of hydraulic conductivity in the Gatuna Formation encountered in foundation boreholes at the WIPP facility generally range from 7.8×10^{-6} m/s. to 1.0×10^{-8} m/s.

Triassic-aged Santa Rosa Formation overlays the Dewey Lake Beds over the eastern half of the WIPP site. Mercer (1983) describes the formation as "a sequence of well-indurated, cemented, fine-to-coarse grain sandstone with interbeds of siltstone and mudstone." The formation ranges in thickness over 200 feet to the northeast to less than 50 feet near the area of the WIPP repository. West of the repository itself, the Dockum Formation is essentially absent, and the Gatuna Formation lies directly over the Dewey Lake Formation.

1.4.2 The Dewey Lake Red Beds

Section 2.1.3.6 of the *No-Migration Variance Petition for the Waste Isolation Pilot Plant* identifies three main sources of geologic information on the Dewey Lake Red Bed Formation in the vicinity of the WIPP. Miller (1955, 1966) studied the petrology of the unit. Schiel (1988, 1994) evaluated outcrops in the vicinity of the site and interpreted geophysical logs of the unit in southeastern New Mexico and west Texas. Holt and Powers (1990) described in detail the Dewey Lake Red Bed Formation at the WIPP Air Intake Shaft.

The Dewey Lake Red Beds are characterized as a deltaic sequence of alternating, thinly bedded siltstone and mudstone with lenticular interbeds of fine-to-coarse grained sandstone. The formation dips gently to the east and thins to the west, where it is also found at relatively shallow depths. The Dewey Lake Red Beds occur at a depth of 20 to 40 feet at the south end of the site. This general trend continues south of the WIPP site boundary. Data indicate that the Dewey Lake is found at moderate depths (70 to 100 feet) along the central axis of the site and occurs between 130 to 220 feet along the eastern site boundary.

Mercer, (1983) and D'Appolonia (1982b) contend that groundwater occurs perched or semiperched lenticular sands in the upper Dewey Lake and suggests that surface recharge may occur where local geologic conditions permit.

The Dewey Lake Red Bed Formation yields water in sufficient volume and quality for domestic and stock wells along the southern WIPP boundary. These wells may produce from perched aquifers (Mercer, 1983, Lappin et al., 1989), or they may produce from transmissive zones in a continuously saturated zone that is elsewhere unproductive due to low transmissivities. On the southeastern boundary of the site, Barn Well is used for domestic purposes and Ranch Well is used for livestock watering. Wells in this area are adjacent to an extensive, thick, active area of dunes, which could be the recharge area for these water bearing sand dunes units. These wells are completed at 94 feet and 212 feet, respectively. Packer-permeability tests indicate that hydraulic conductivities range from 2.5×10^{-6} m/s to 1.0×10^{-8} m/s. Presumably, water bearing zones would have higher values.

1.5 Sample Quality Assurance

Field quality control samples such as duplicate samples, field blanks, and equipment rinsate samples were collected by the sampling team and documented in the sampling logbook. All samples were collected and managed in accordance with Section 3.3.1 of the *Quality*

Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling (WP02-EM1), and Section 3.3 of the *WIPP Site Effluent and Hazardous Materials Sampling Plan (WP02-EM2)*.

Deionized water was used for the field and equipment rinsate blank samples because deionized water provides excellent sensitivity to contamination. Equipment rinsate samples were collected for each type of sample (organic soil, and inorganic soil). Equipment rinsate blanks were collected to verify the effectiveness of field equipment decontamination. The equipment blanks are collected, using deionized water transported to the sampling site. At the sampling location, deionized water is poured over or through the sample collection device, collected, and returned for analysis.

1.5.1 Data Quality Assurance and Data Validation

All sample analyses were completed in accordance SW-846 or equivalent analytical protocols. Halliburton NUS Laboratory is the contract laboratory used to analyze all Release Assessment Samples. Sample analytical methods and Quality Assurance/Quality Control requirements have been completed in accordance with the *Halliburton NUS Laboratory General Quality Assurance Plan*, March 10, 1995. The Halliburton QA plan defines all equipment calibration, sample handling, sample analyses, matrix blank, and method blank analyses required to meet SW-846 QA/QC requirements.

An independent data quality review was completed by Harding Lawson & Associates (HLA) Engineering and Environmental Services. HLA developed the *Final Data Validation Procedure, Voluntary Release Assessment (VRA) Program* to complete QA/QC data package reviews in accordance with the data quality requirements described in SW-846 and the *Halliburton NUS General Quality Assurance Plan.*

1.6 Calculation of Action Levels Required to Evaluate Analytical Results

Appendix D of Proposed *40 CFR § 264.521(d), FR Vol. 55, No. 145, VI(D), p. 30870,* establishes criteria for selecting and calculating action levels for soils. Action level concentrations in Appendix D assume a chronic exposure through consumption of soil media contaminated with hazardous constituents. Criteria for establishing soil action levels can also be found in proposed *40 CFR § 264.521(d)*, Appendix A. The tables contained in Appendix A provide "Examples of Concentrations Meeting Criteria for Action Levels for Air, Water, and Soil Media." To complete Appendix D soil action level calculations, the DOE multiplied all TCLP concentrations by 20 (total concentration level in mg/kg) to obtain the intake assumption used in the Appendix D formula to compute the actual action level.

No action levels are established in Appendices A, D, or F for Barium, Benzene, Thallium or Vinyl Chloride tested at SWMUs 001h, 001L, 001s, and 003a. For these four analytes, only Barium was detected above the method detection limit. It is important to note that constituent concentrations for these analytes collected inside the SWMU mudpit areas are

comparable to concentrations for both up-and-down gradient background samples.

1.7 EPA Region III Risk Based Concentration Tables

As part of the assessment of the constituent action levels, the DOE evaluated action level criteria developed by the EPA Region III office of Technical and Program Support. The DOE requests that the "EPA Region III Risk Based Concentration (RBC) Table" be used in the evaluation of release assessment data when an action level has not been established in Appendices A, D, or F. As part of the evaluation of analytical data collected at SWMUs 001h, 001L, 001s, and 003a, the DOE used the RBC action levels for the constituents that do not have calculated action levels in Appendix D of the Subpart S rule. When using the RBC tables, the DOE used the risk-based concentrations for soil ingestion from an industrial land use. This criteria appeared to most closely match the parameters established in Appendix D. The Soil Screening Levels for transfers to groundwater are not appropriate because geologic data demonstrates that any potential release of hazardous constituents to groundwater from any of the SWMUs described in this data summary report is extremely remote.

1.7.1 Brief Summary of Guidance on the Content, Use, and Limitations of the Region III Risk Based Concentration Table

Toxicologists working with the EPA Region III Technical and Program Support Branch developed the RBC table to screen sites not yet on the National Priority List (NPL), respond rapidly to citizen inquiries, and spot-check formal baseline risk assessments. Region III distributes this table and associated guidance to all interested parties on a semiannual basis. The Risk-Based table used in this assessment is the table published for the period July - December. A complete copy of the July - December 1995, Risk-Based Table and associated guidance information is contained in Appendix 1.

The EPA Region III Technical and Program Support Branch developed guidance and limitations on the use of the RBC table. Important sections of this guidance have been transcribed here to define the scope and limitations of the RBC table. Background materials provide the complete basis for all the calculations, with the intent of showing users exactly how the RBCs were developed.

The RBC table contains reference doses and carcinogenic potency slopes obtained from the Integrated Risk Information System (IRIS) through September 1, 1995, the Health Effect Assessment Summary Table (HEAST) through May 1995, and the EPA National Center for Environmental Assessment (NCEA) Superfund Health Risk constants. Constants have been combined with "standard" exposure scenarios to calculate RBCs. The RBCs are chemical

concentrations corresponding to fixed levels of risk (i.e., a hazard quotient of 1, or lifetime cancer risk of 10^{-6}, whichever occurs to a lower concentration) in water, air, fish tissue, and soil.

The RBC table also includes soil screening levels (SSLs) for protection of groundwater and air. Most SSLs were obtained directly from the proposed SSL guidance document developed by the EPA Office of Solid Waste and Emergency Response (OSWER). The Technical and Program Support Branch has have added some additional SSLs based on the same methodology. Sources of SSLs are noted in the RBC table. SSLs incorporate the same exposure assumptions as RBCs, plus additional assumptions needed for intermedia extrapolation. SSLs are therefore distinct from RBCs and should be used only in the framework proposed in the OSWER document.

Guidance provided by Region III also states that the RBCs have several important limitations. Specifically excluded from consideration are (1) transfers from soil to air and groundwater, and (2) cumulative risk from multiple contaminants or media. Additionally, the guidance documentation also states that the toxicity information contained in the table have been assembled by hand, and despite extensive checking and years of use, may contain errors. Thus, agency personnel advise that users cross-check all information before relying on any referenced doses (RfDs) or carcinogenic potency slopes (CPSs) in the RBC table.

Region III guidance documentation states that many users want to know if the risk-based concentrations can be used as valid no-action levels or cleanup levels, especially for soils. The answer is a bit complex. First, it is important to realize that the RBC table does not constitute regulation, and should not be viewed as a substitute for a site-specific risk assessment. For sites where:

1. A single medium is contaminated

2. A single contaminant contributes nearly all of the health risk

3. Volatilization or leaching of that contaminant from soil is expected not to be significant

4. The exposure scenarios used in the RBC table are appropriate for the site

5. The fixed risk levels used in the RBC table are appropriate for the site

6. Risk to ecological receptors is expected not to be significant

The risk-based concentrations would probably be protective as no-action levels or cleanup goals. However, to the extent that a site deviates from this description, as most do, the RBCs would not necessarily be appropriate. Although the four SWMU sites described in this work plan may not specifically meet the six criteria described above, the results of release

assessment sampling indicate no potential impact to human health and the environment exists. Thus, the values contained in the RBC table may be appropriate to use as guidance for making a No Further Action determination.

1.7.2 Applicability of Assumptions Contained in Appendix D and the EPA Region III RBC Tables

Several assumptions contained in Appendix D for evaluating action levels are not applicable to the soils contained in the four SWMUs described in this summary report. First, Appendix D assumes that shallow soils in the vicinity of a SWMU site will ultimately be used for residential use. Second, this model also assumes that soils will be ingested over a long period of time, creating a long-term or chronic health risk. All of the SWMUs at the WIPP are located within the WIPP Land Withdrawal Area. Congress withdrew these areas from all types of land use except TRU waste management and historical land uses such as hunting and livestock grazing. The WIPP land withdrawal effectively precludes residential land for posterity and eliminates a direct ingestion pathway. Ingestion due to the human consumption of livestock or game animals will be precluded by the implementation of reclamation activities that will cover all SWMU sites with top soil and replant the site with native vegetation. And third, analytical data demonstrates that soil contamination at these SWMU sites are below *40 CFR § 264.521(d)*, Appendix D or Region III RBC concentrations and do not represent a potential threat to groundwater sources.

2.0 RESULTS OF RELEASE ASSESSMENT SAMPLING AT SWMU 001H

2.1 Location of SWMU 001h

This section of the release assessment data summary report documents the results of release assessment sampling at SWMU 001h and describes the proposed corrective actions at this location. SWMU 001h is located in the NE ¼ of the NE ¼ of the NE ¼ of Section 28, Township 22 South, Range 31 East. H-15 was drilled in 1986 to conduct a series of water quality evaluations and to develop a database of Culbera Formation water levels. Boyles Brothers Drilling Company drilled the USGS P-2 borehole in September 1976 as part of a 21-well U.S. Geologic Survey (*USGS*) resource evaluation program to investigate the potash resources in the Salado Formation (*USGS, 1978*).

USGS drilling logs indicate that air foam was used for P-2. Saturated sodium and potassium chloride brine with starch and salt gel (attapulgite) were also used to complete the P-2 borehole. As with P-1 borehole, diesel fuel was apparently added to inhibit dissolution of the Salado (*WIPP Hydrologic Data Report #5*). Saturated brine and "traced" freshwater are listed as drilling fluid constituents in the H-15 borehole data report. Saturated brine is specifically described as a 70-30 mixture of cement slurry and salt with 2 percent bentonitic gel. Meta-trifluorobenzoic acid (2 mg/l) was added to measure borehole and aquifer contamination of the Culebra from the drilling process. Approximately 1,336 gallons of traced drilling fluid were lost to the formation, representing about 75 percent of the drilling fluid used (*WIPP Hydrologic Data Report #5*).

SWMU 001h consists of the mudpits constructed for the drilling of the P-2 potash exploration well and the H-15 Culebra test well. The H-15 test well was drilled to a total depth of 1,895 feet. After setting 20 feet of 7-inch casing, a 5.875 inch rotary borehole was drilled to 1,038 feet below land surface. A 4.5 inch casing liner was installed and the hole was deepened to 1,500 feet using a 3.94 inch rotary drill bit. The hole was drilled to the final depth of 1,895 feet using a 3.94 inch core bit.

2.2 Geology and Hydrogeology in the Area of SWMU 001h

The USGS lithology logs identify the near-surface deposits at SWMU 001h as shallow, fine-to-medium grained Holocene soils and Eolian sands that are about 10 feet thick. The Gatuna Formation at SWMU 001h is approximately 20 feet thick (USGS, 1978). The Gatuna Formation is a poorly sorted zone of sandstone and calcareous cement that overlays the Santa Rosa Sandstone Formation. The Santa Rosa Sandstone formation at this site is approximately 126 feet thick and is composed of pale reddish-brown, medium-to-fine grained sandstones containing approximately 5 percent caliche. The Santa Rosa Sandstone sit directly on top of the Dewey Lake Redbed Formation.

The Dewey Lake formation is approximately 526 feet thick in the P-2 borehole. The Dewey Lake Red Beds in this region are characterized as a deltaic sequence of alternating, thinly bedded siltstone and mudstone with lenticular interbeds of fine-to-coarse grained sandstone (Mercer, 1983; D'Appolonia 1982b). Mercer (1983) contends that groundwater occurs perched or semiperched in lenticular sands in the upper Dewey Lake.

The RFA describes soil development at this location as poor, and the release potential for soils in the immediate vicinity of SWMU 001h as high. This suggests that surficial units in this area may display greater permeability than other sites underlain by well-cemented caliche.

Although the RFA identifies the release potential to surface soils at this location as high, analytical data from samples collected at SWMU 001h indicate that the constituent concentrations for all analytes, except Barium, are below method detection limit, and concentrations for samples collected inside the mudpit area are equivalent to the background concentrations. The mean TCLP Barium concentration at this location is 0.79 mg/l or 15.8 mg/kg total concentration equivalent. These concentrations are significantly below RBC table action level concentration of 140,000 mg/kg.

The groundwater migration potential at SWMU 001h is low relative to other locations onsite. The Dewey Lake Formation at this location is not water bearing. The use of air foam during the drilling of the P-2 borehole greatly increased the driller's ability to detect the presence of shallow groundwater in the borehole. USGS drilling logs indicate that no water was encountered during drilling. Thus, constituent migration to the Dewey Lake Formation or to the Culebra Dolomite 860 feet below surface is not credible.

Once drilling of the P-2 borehole was completed, all casing was retrieved and the hole was cemented from the bottom of the hole 1,879 feet to the surface. After drilling of the H-15 borehole was completed, all casing was removed and the hole was cemented to the surface and abandoned.

2.3 Sampling Protocols

During sampling visits, the sampling team used information data contained in the RFA to survey the location of the H-15 and P-2 mudpits. The H-15 mudpit is a rectangular mudpit approximately 18 feet wide and 55 feet long, located approximately 18 feet east of the H-15 well cap and in the northeast corner of the P-2 drill pad area.

The P-2 mudpit is located approximately 40 feet southeast of the P-2 well head, on the eastern edge of the P-2 well pad. The P-2 mudpit is approximately 20 feet wide and 35 feet long. The P-2 well pad is unvegetated and covered with compacted caliche. No discolored soil or liner materials were identified during sampling activities.

A total of 26 soil samples were collected to characterize the vertical and horizontal extent of any potential release from the SWMU 001h. The rationale for selecting sample depths at both the H-15 and P-2 mudpits during voluntary release assessment sampling were based on an evaluation of the 001h SWMU site and historical information contained in the RFA.

A list of the number and type of samples collected at the H-15 mudpit and associated sample intervals are provided in Table 3. A list of the number and type of samples collected at the P-2 mudpit and their associated sample intervals are provided in Table 4. Organic and metals samples collected in both mudpit areas from the 12-24 inch depth were used to provide data from the depth where the highest concentration of potential hazardous constituents were anticipated. Samples collected from both mudpits from the 60-72 inch depth were used to quantify the maximum vertical extent of potential constituent migration. A revised sample location map for SWMU 001h is provided in Figure 2.

TABLE 3

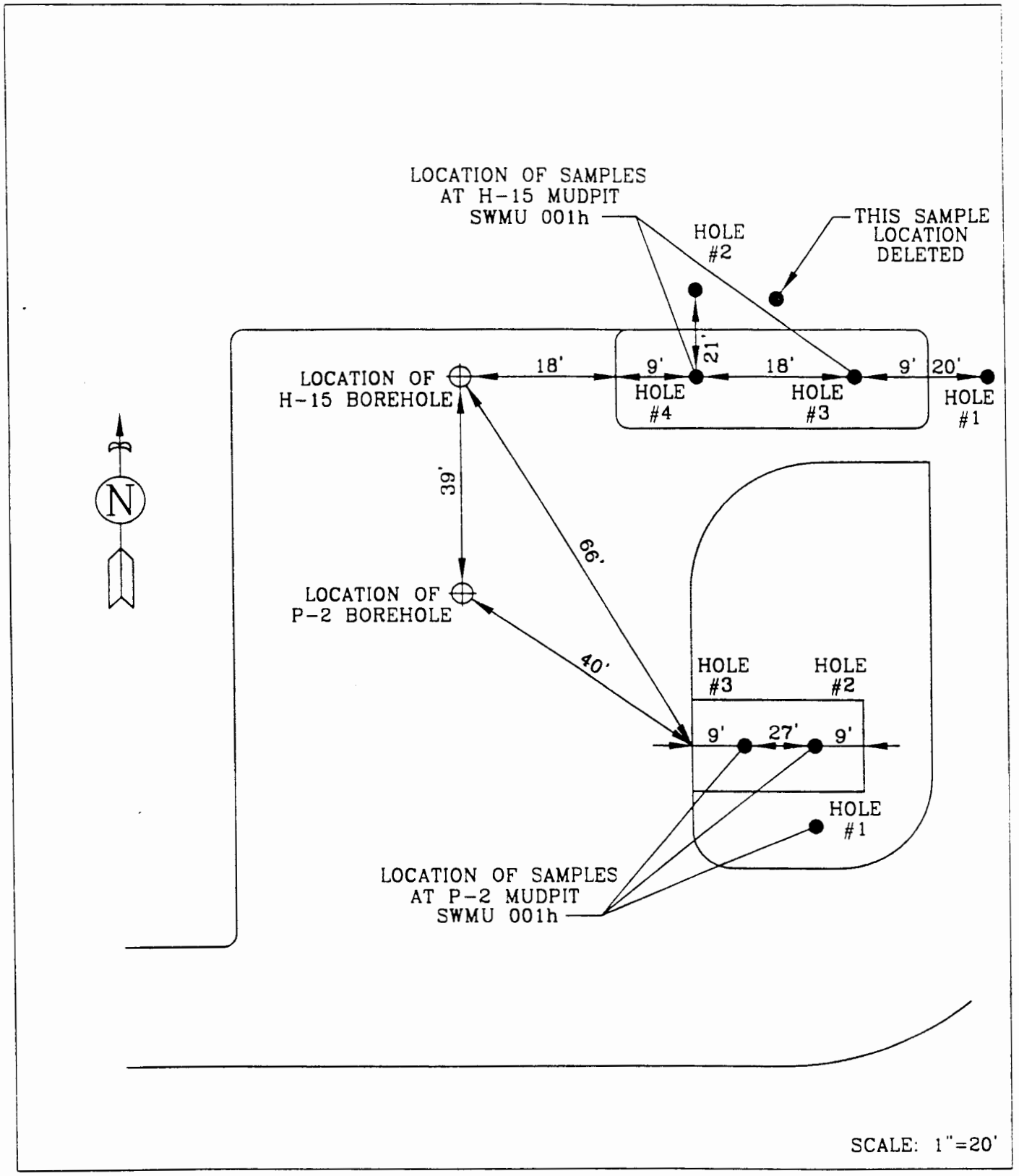
NUMBER, TYPE, AND SAMPLING INTERVAL FOR SAMPLES COLLECTED AT SWMU 001H (H-15 MUD PIT)		
	12 - 24"	60 - 72"
NUMBER OF SAMPLES:		
Inorganic Analysis	4	4
Organic Analysis	2	2
NUMBER OF DUPLICATE SAMPLES:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF EQUIPMENT BLANKS:		
Inorganic Analysis	1	0
Organic Analysis	1	0
NUMBER OF FIELD BLANKS:		
Inorganic Analysis	0	0
Organic Analysis	0	0

TABLE 4

NUMBER, TYPE, AND SAMPLING INTERVAL FOR SAMPLES COLLECTED AT SWMU 001H (P-2 MUD PIT)		
	12 - 24"	60 - 72"
NUMBER OF SAMPLES:		
Inorganic Analysis	3	3
Organic Analysis	2	2
NUMBER OF DUPLICATE SAMPLES:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF EQUIPMENT BLANKS:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF FIELD BLANKS:		
Inorganic Analysis	1	0
Organic Analysis	1	0

FIGURE 2

SAMPLE LOCATION MAP SWMU 001h (H-15 & P-2)



Up-gradient and down-gradient samples were collected to evaluate the lateral extent of potential constituent migration and to establish background concentrations for constituents in the vicinity of SWMU 001h. These samples were collected from an undisturbed location, immediately up-and-down gradient of the SWMU area. Up-gradient and down-gradient metals samples were collected at both the 12-24 inch and 60-72 inch depth. Background sample locations were selected by the sampling team during the sampling visit. Sample locations were noted in the sample logbook and sampling location maps were revised to reflect the location of up-gradient and down-gradient samples.

A tractor mounted power auger was used to drill an 8 inch diameter borehole to the appropriate sampling depth. A stainless tube sampler was used to collect a core sample for organic analytes from both the 12-24 inch and 60-72 inch depths. A disposable teflon scoop was generally used to collect metal constituent samples from the 12-24 inch depth. Metal constituent samples were collected in one liter (1000 ml) clear glass bottles with teflon lined lids. Volatile organic constituent samples were collected in 4 ounce (125 ml) clear glass bottles with welded septum lids.

2.4 Data Quality Assurance

Analytical data generated for samples collected at SWMU 001h were completed in accordance with SW-846 or equivalent analytical protocols. Halliburton NUS Laboratory is the contract laboratory used to analyze all Release Assessment Samples. Sample analytical methods and Quality Assurance/Quality Control requirements have been completed in accordance with the *Halliburton NUS Laboratory General Quality Assurance Plan*, March 10, 1995. The Halliburton QA plan defines all equipment calibration, sample handling, sample analyses, matrix blank, and method blank analyses required to meet *SW-846* QA/QC requirements.

2.5 Independent Data Validation

An independent data quality review of SWMU 001h samples was completed by Harding Lawson & Associates (HLA) Engineering and Environmental Services Incorporated. HLA developed the *Final Data Validation Procedure* to complete QA/QC data package reviews in accordance with the data quality requirements described in *SW-846* and the *Halliburton NUS General Quality Assurance Plan*. A copy of the independently reviewed analytical data package for SWMU 001h is provided as Appendix 2.

2.6 Comparison of Analytical Results and EPA Action Levels at SWMU 001h

Appendix D of proposed *40 CFR § 264.521(d), FR Vol. 55, No. 145, VI(D), p.30870*, establishes criteria for selecting and calculating action levels for soils. Action level concentrations in Appendix D assume a chronic exposure through consumption of soil media contaminated with hazardous constituents. Criteria for establishing soil action levels can also be found in *40 CFR § 264.521(d)*, Appendix A. The tables in Appendix A contain

"Examples of Concentrations Meeting Criteria for Action Levels for Air, Water, and Soil Media." In order to complete Appendix D soil action level calculations, the DOE multiplied all TCLP concentrations by 20 (estimated total concentrations in mg/kg.) to obtain the intake assumption used in the Appendix D formula to compute the actual action level.

For all but one constituent listed in Appendix A and Appendix D, analytical results demonstrate that sample constituent concentrations are below soil action levels. The only exception is the constituent concentrations for Lead. Consistently, the TCLP analytical concentration for Lead was at the established TCLP method detection limit of <0.5 mg/l. Upon receipt of the initial analytical results, the contract laboratory was contacted, and a randomly selected group of samples were re-analyzed for Lead to achieve a lower detection limit. Analytical results for all of these re-analyzed samples showed TCLP concentrations of <0.05 mg/l for Lead. This concentration is below the Maximum Contaminant Level (MCL) for Lead of 0.05 mg/l established in Appendix A. The matrix spike and matrix duplicate recoveries for three Lead samples collected at SWMU 001h were below the minimum detection limit of 75 percent. Therefore, the Lead results for samples RA-95-195, RA-95-197 and RA-95-199 from batch 38634 were qualified as below method detection limit/estimated and given the EPA qualification of U,J. The results of voluntary release assessment samples collected at SWMU 001h are provided in Table 5.

No action levels are established in Appendices A, D, or F for Barium, Benzene, Thallium or Vinyl Chloride tested at SWMU 001h. For these analytes, only Barium was detected above the method detection limit. The mean TCLP Barium concentration at this location is 0.79 mg/l or 15.8 mg/kg total concentration equivalent. These concentrations are significantly below RBC table action level concentration of 140,000 mg/kg. It is important to note that constituent concentrations for all other analytes collected from inside the SWMU mudpit area are all below method detection limits and identical to concentrations for both up-and-down gradient background samples.

TABLE 5

3 8 96

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001h, Mudpit P-2

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	EQ BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95
WID Sample Numbers:	RA-95-189	RA-95-190	RA-95-191	RA-95-193	RA-95-195	RA-95-197	RA-95-199
			RA-95-192	RA-95-194	RA-95-196	RA-95-198	RA-95-200
Analytes							
Leachable Metals (mg/L)							
Arsenic (As)	0.1 UB	0.5 U	0.1 UB	0.5 U	0.1 UB	0.5 U	0.1 U
Barium (Ba)	0.28 UB	1.2 B	0.39 UB	1.2 B	0.29 UB	1.1 B	0.005 U
Cadmium (Cd)	0.005 U	0.02 U	0.005 U	0.02 U	0.005 U	0.02 U	0.005 U
Chromium (Cr)	0.02 U	0.1 U	0.02 U	0.1 U	0.02 U	0.1 U	0.02 U
Lead (Pb)	0.05 U	0.2 U	0.05 U	0.2 U	0.05 UJ	0.2 UJ	0.05 UJ
Mercury (Hg)	0.0001 U	0.0001	0.0001 U	0.0002	0.0001 U	0.0001	0.0001 U
Thallium (Tl)	0.2 U	1 U	0.2 U	1 U	0.2 U	1 U	0.2 U
Leachable Volatiles (mg/L)							
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected, value is method reporting limit
UB Detected in the blank and qualified as not detected

TABLE 5
(cont.)

3/8/96

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001h, H-15

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4	EQ BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95
WID Sample Numbers:	RA-95-175	RA-95-176	RA-95-177	RA-95-178	RA-95-179	RA-95-183	RA-95-185	RA-95-187	RA-95-181
					RA-95-180	RA-95-184	RA-95-186	RA-95-188	RA-95-182
Analytes									
Leachable Metals (mg/L)									
Arsenic (As)	0.2 UB	0.2 U	0.1 UB	0.2 U	0.1 UB	0.2 U	0.2 UB	0.5 U	0.1 U
Barium (Ba)	0.43 UB	1.3 B	0.79 B	0.99 B	0.44 UB	1.1 B	0.36 UB	1.2 B	0.005 U
Cadmium (Cd)	0.005 U	0.01 U	0.005 U	0.01 U	0.005 U	0.02 U	0.005 U	0.02 U	0.005 U
Chromium (Cr)	0.02 U	0.04 U	0.02 U	0.04 U	0.02 U	0.04 U	0.02 U	0.1 U	0.02 U
Lead (Pb)	0.05 U	0.1 U	0.05 U	0.1 U	0.05 U	0.1 U	0.05 U	0.2 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001	0.0001 U	0.0001	0.0001 U	0.0001	0.0001 U	0.0001	0.0001 U
Thallium (Tl)	0.2 U	0.4 U	0.2 U	0.4 U	0.2 U	0.4 U	0.2 U	1 U	0.2 U
Leachable Volatiles (mg/L)									
1,1,1-Trichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
1,2-Dichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Chloroform	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Ethyl benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Toluene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Vinyl chloride	NA	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
Xylenes, total	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ

B Detected in the blank
EQ BLANK Equipment Rinse Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected, value is method reporting limit
UB Detected in the blank and qualified as not detected

2.7 Evaluation of Selected Analytical Results Using Risk Based Concentrations

As part of the assessment of the constituent action levels at SWMU 001h, the DOE used the Risk Based Concentration (RBC) levels, developed by the EPA Region III office of Technical and Program Support, to evaluate analytical results for Barium, Benzene, Thallium, and Vinyl Chloride. These criteria appeared to most closely match the parameters established in Appendix D.

The RBC soil concentration for Barium is 140,000 mg/kg. The analytical results for Barium at SWMU 001h ranged from 0.28 mg/l to 1.3 mg/l. These TCLP concentrations can be converted to total concentrations (mg/kg equivalent) by multiplying the TCLP concentration by 20. Thus, the total concentration equivalent for Barium analytes at SWMU 001h range from 5.6 mg/kg to 26.0 mg/kg, significantly below the 140,000 mg/kg RBC soil concentration.

Using the same methodology, the Region III RBC soil concentration for Benzene is 200 mg/kg. Benzene concentrations at SWMU 001h were all below the TCLP method detection limit of <0.05 mg/l. Converting the TCLP concentration to total concentration, the total Benzene concentration for all samples collected at SWMU 001h are <1.0 mg/kg. This concentration is significantly below the 200 mg/kg soil concentration established for Benzene contained in the RBC table.

Initial Thallium analyses at SWMU 001h were all at a method detection limit of <2.0 mg/l. Upon receipt of initial analytical results, selected samples from SWMU 001h were also re-analyzed for Thallium. Re-analysis established a lower detection limit for Thallium that ranged from <0.2 mg/l to <1.0 mg/l. No RBC industrial soil ingestion concentration for Thallium is provided in Table 1. However, a SSL of 0.40 mg/kg for soil transfers to groundwater is provided. As discussed earlier, geologic data demonstrates that the release of constituents from SWMU 001h to groundwater is extremely remote. Thus, a soil screening concentration has limited application at this site. Additionally, the Thallium concentrations for samples collected inside both the P-2 and H-15 mudpit areas, and at the up-and-down gradient sample locations are below SW-846 method detection limits.

The RBC soil concentration for Vinyl Chloride is 3.0 mg/kg. TCLP analytical concentrations for all Vinyl Chloride samples collected at SWMU 001h are <0.1 mg/l. Converting the TCLP concentration to total concentration, the total Vinyl Chloride concentration for samples collected at each of the SWMU 001h boreholes is <2.0 mg/kg. Thus, the Vinyl Chloride concentrations at SWMU 001h are below both the method detection limit and the Region III Risk Based Concentrations for industrial soils.

2.8 Proposed Corrective Actions at SWMU 001h

Based on the criteria provided in proposed *40 CFR § 264.514 FR Vol. 55, No. 145, VI(D), p. 30813*, the voluntary release assessment analytical data collected at SWMU 001h demonstrates that no release of hazardous constituents has occurred. This data clearly demonstrates that there is no threat to human health or to the environment from drilling activities conducted at SWMU 001h and that additional RFI assessments are not required. In fact, thousands of similar mudpits exist immediately outside the WIPP boundary, and the regulations do not require additional corrective actions at these sites.

Because it is the EPA's intent to encourage voluntary corrective actions as described in the preamble of the Proposed Subpart S Rule, the DOE requests that after appropriate public review and agency approval, a No Further Action determination be granted for SWMU 001h prior to the issuance of the RCRA Part B Permit for the WIPP. Any delay in the issuance of No Further Action determination may require the DOE to submit a Class III permit modification to remove this SWMU from the list of sites requiring evaluation under the RFI process. The submittal of a Class III permit modification to remove sites with no potential to impact human health or the environment represents an unreasonable expense. If a No Further Action is supported by both the EPA and NMED, this site will be replanted with native vegetation, in accordance with guidelines developed in the *WIPP Land Management Plan (DOE WIPP 93-004)*.

3.0 RESULTS OF RELEASE ASSESSMENT SAMPLING AT SWMU 001L

3.1 Location of SWMU 001L

This section of the Release Assessment Data Summary Report documents the results of release assessment sampling at SWMU 001L and describes the proposed corrective actions at this location. SWMU 001L is located in the SE ¼ of the SE ¼ of the SE ¼ of Section 17, Township 22 South, Range 31 East. SWMU 001L is made up of the mudpit complex developed for the drilling of the WIPP-12 exploration borehole and the mudpit constructed to support the drilling of the P-5 potash exploration borehole.

Pennsylvania Drilling Company drilled P-5 in 1976. Limited data is available for the P-5 drill site. It is reasonably assumed that similar drilling fluid mixtures were used at this site as are known to be used at other potash evaluation boreholes. These drilling additives include: saturated sodium and potassium chloride brine; starch and salt gel (attapulgite); and diesel fuel to reduce salt dissolution.

WIPP-12 was drilled on the P-5 well pad in 1978 and deepened in 1981 and 1982 to investigate lithologic and stratigraphic details of the Salado and Castile Formations. WIPP-12 was drilled to a total depth of 2,785 feet. The *WIPP-12 Borehole Data Report* and *Sandia National Laboratory Report (SAND88-7014)* indicate that several types of drilling fluids were used to drill WIPP-12. A salt-based drilling mud was used to a depth of 1,000 feet, a 10-pounds/gallon mix of starch, soda ash, and caustic soda (NaOH for pH control) was used between 1,000 and 2,773 feet, and a brine-salt gel (attapulgite) mixture was used to 3,927 feet. A NaCl-based weighing agent was added to control the flow from a pressurized brine encountered at 3,011 feet below the surface. In reference to WIPP-12 drilling fluid, DOE/WIPP 92-007 also suggests that an organic material (lignite) and a density-increasing material such as barite may also have been used.

The WIPP-12/P-5 well pad is the largest mudpit complex at the WIPP site. Linear dark bands of soil and stressed or sparse vegetation delineate the mudpit location. During the sampling visit the sampling team reported that the mudpit areas were rough graded, exposing a mixture of surface sands and caliche material. The hummocky surface probably accounts for sparse vegetative growth in the area of the WIPP-12 mudpit complex. The area around the P-5 mudpit is made up of compacted caliche, and there is essentially no vegetative growth on the P-5 drill pad.

Reports by *D'Appolonia Consulting Engineers (1982a)* indicate that 2.5 million gallons of brine outflow from the Castile were pumped to shallow "reserve pits." DOE/WIPP 92-007 states that the WIPP-12 reserve/mudpit pit complex was filled in 1987. The majority of this site is with crushed and compacted caliche.

3.2 Geology and Hydrogeology in the Area of SWMU 001L

The stratigraphic summary for borehole WIPP-12 is contained in the *Basic Data Report for Drillhole WIPP-12* (SAND82-2336). Lithologic data for the P-5 borehole is contained in the USGS open file report (USGS 1978) Both reports identify the near-surface geology at SWMU 001h as approximately 13-16 feet of Holocene-aged sands and soil. The Mescalero Caliche Formation at this site ranges in thickness from 16 feet to 19 feet in depth. The Triassic age Santa Rosa Sandstone Formation underlies the Gatuna formation at this site. Quaternary aged Gatuna Formation sandstones occur from 19 to 29 feet, and the Santa Rosa Sandstone Formation continues to approximately 167 feet in depth.

The Dewey Lake Redbed formations in the WIPP-12 borehole extend from 167 feet below surface to approximately 640 feet in depth. In this region the Dewey Lake Red Beds are characterized as a deltaic sequence of alternating, thinly bedded siltstone and mudstone with lenticular interbeds of fine-to-coarse grained sandstone (Mercer, 1983; D'Appolonia 1982b). Mercer (1983) contends that groundwater occurs perched or semiperched in lenticular sands in the upper Dewey Lake.

The RFA identifies the migration potential to groundwater at this location as low, relative to other locations onsite. Drilling logs do not reference contact with water-bearing strata or the presence of moist cuttings while drilling through the Dewey Lake Formation. Regional hydrogeologic studies indicate that the Dewey Lake Formation is less likely to contain water as far north as the WIPP-12 well site. Migration to the Culebra Dolomite aquifer 804 feet below surface is not credible.

The RFA identifies the release potential to surface soils in the area of SWMU 001L as high. Although the release potential to surface soils is high, release assessment sampling data indicates that, with the exception of Barium, the constituent concentration of samples collected inside the mudpit area, and the concentrations of up-gradient and down-gradient samples, are below the SW-846 method detection concentrations. The mean TCLP Barium concentration at this location is 1.02 mg/l or 20.5 mg/kg total concentration equivalent. These concentrations are significantly below RBC table action level concentration of 140,000 mg/kg.

Once drilling of the P-5 borehole was completed in 1976, the entire length of the borehole was plugged with cement. The hole was abandoned in 1976, and 568 feet of 4.5-inch casing was abandoned in the hole from a depth from 435 to 1,003 feet below the surface.

The WIPP-12 was initially developed in 1978 as a water monitoring well. The well was drilled and reamed to a 12.25 inch diameter down to a depth of 1,003 feet. A 9.625 inch casing was set and the casing and annular space was cemented from 1,002 feet to the surface. The hole was then cored and reamed to a diameter of 7.875 inches to a total depth of 2,785 feet.

The *WIPP-12 Borehole Data Report* and *Sandia National Laboratory Hydrologic Data Report #5 (SAND87-7125)* describe, how in 1981, the WIPP-12 borehole was deepened to a depth of 3927 feet to investigate the geology of the Castile Formations. The borehole was deepened using a 7.875 inch rotary bit until a pressurized brine reservoir was encountered at a depth of 3,107 feet. The hole was then cored drilled using a 6-inch diameter core bit to a depth of 3,927.5 feet.

In June 1983, the upper portion of the WIPP-12 borehole was isolated from the brine reservoir with the installation of a nonretrievable bridge plug. The borehole plug consists of a bridge plug set in the Castile formation from 3,000 to 3,005 feet. The bridge plug was then capped with 27 feet of sand. A 189 foot cement plug was then placed on top of the sand. (D'Appolonia, 1983). Once the bridge plug was in place, a 12.25 inch locking well cap was welded on the top of the casing, and the WIPP-12 borehole was converted to a Culebra Formation water level monitoring well.

3.3 Sampling Protocols

During the sampling visit to the SWMU 001L, the sampling team located and sampled both the P-5 mudpit and the large WIPP-12 mudpit complex. The P-5 mudpit is located approximately 45 feet south of the P-5 borehole. The P-5 borehole is approximately 18 feet wide and 60 feet long.

The large WIPP-12 mudpit complex is made up of four individual mudpits located on the eastern site of the drill pad. This site is characterized by hummocky, dark bands of fill material that form the berms separating four distinct rectangular mudpits. The four mudpits run in a north/south direction and are approximately 330 by 75 feet; 360 by 40 feet; 360 by 36 feet; and 330 by 75 feet respectively.

A total of 24 soil samples were collected to characterize the vertical and horizontal extent of any releases from the mudpits located at SWMU 001L. Twelve samples were collected from the P-5 mudpit and 12 samples were collected from the WIPP-12 mudpit complex. As described in the release assessment work plan, there are a total of four mudpits associated with the WIPP-12 mudpit complex. Based on information contained in Hydrologic Data Summary Report #5, the DOE determined that the type of drilling fluids discharged into each of four of the WIPP-12 mudpits are similar in nature. Following this logic, two groups of samples were collected from two of the four WIPP-12 mudpits. A summary the number and type of samples collected at the WIPP-12 mudpit is provided in Table 6. A summary the number and type of samples collected at the P-5 mudpit is provided in Table 7.

TABLE 6

NUMBER, TYPE, AND SAMPLING INTERVAL FOR SAMPLES COLLECTED AT SWMU 001L (WIPP-12 Mudpit)		
	12 - 24"	**60 - 72"**
NUMBER OF SAMPLES:		
Inorganic Analysis	3	3
Organic Analysis	2	2
NUMBER OF DUPLICATE SAMPLES:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF EQUIPMENT BLANKS:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF FIELD BLANKS:		
Inorganic Analysis	1	0
Organic Analysis	1	0

TABLE 7

NUMBER, TYPE, AND SAMPLING INTERVAL FOR SAMPLES COLLECTED AT SWMU 001L (P-5 Mudpit)		
	12 - 24"	60 - 72"
NUMBER OF SAMPLES:		
Inorganic Analysis	3	3
Organic Analysis	2	2
NUMBER OF DUPLICATE SAMPLES:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF EQUIPMENT BLANKS:		
Inorganic Analysis	1	0
Organic Analysis	1	0
NUMBER OF FIELD BLANKS:		
Inorganic Analysis	0	0
Organic Analysis	0	0

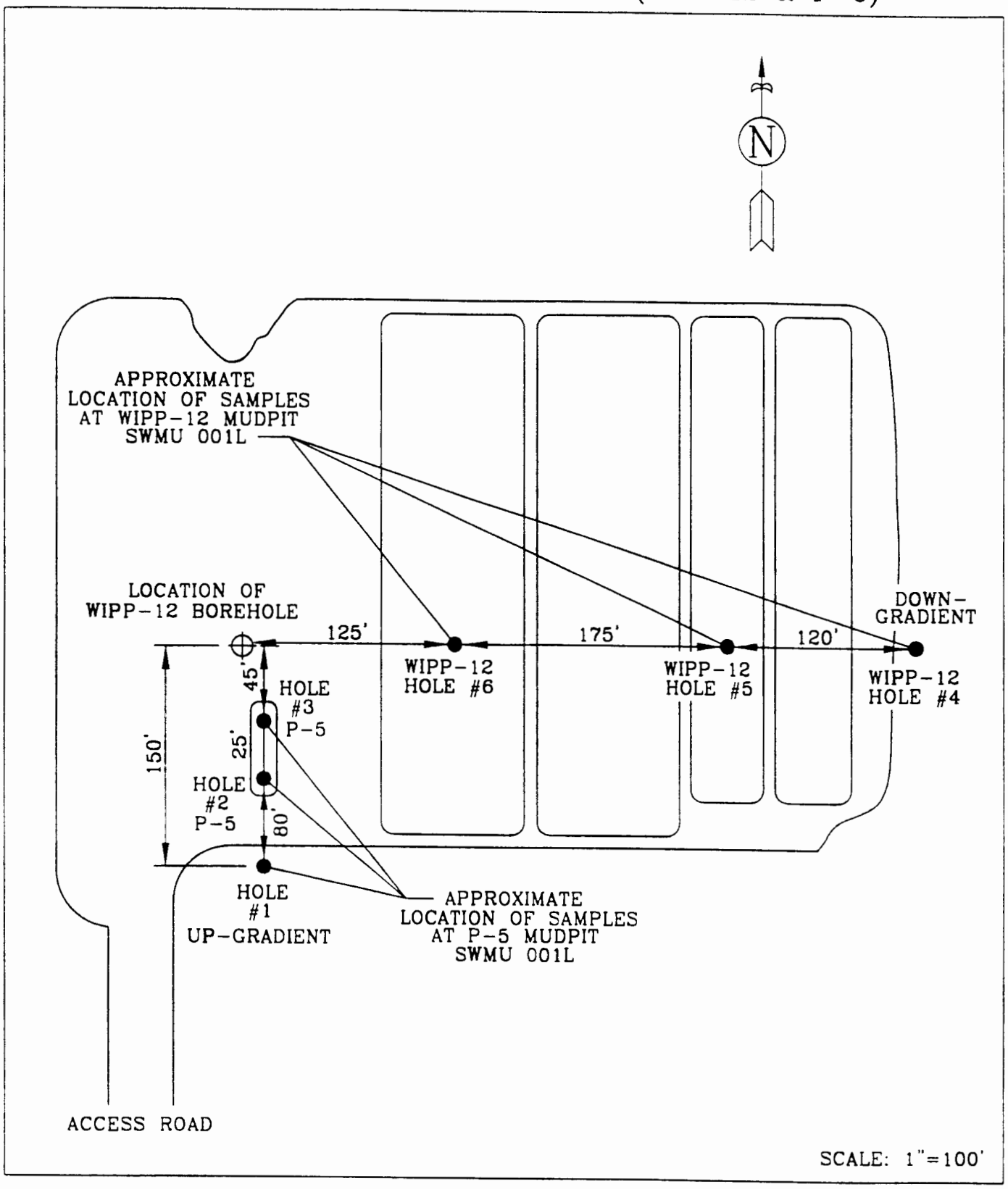
The rationale for selecting sample depths at mudpits during the initial round of voluntary release assessment sampling was based on an evaluation of the 001L SWMU site and historical information about this site contained in the RFA. Organic and metals samples collected in the mudpit area from the 12-24 inch depth were used to provide a sample from the depth where the highest concentration of potential hazardous constituents were anticipated. Samples collected at the 60-72 inch depth were used to quantify the maximum vertical extent of potential contamination migration. Figure 3 is the revised SWMU 001L sample location map.

Up-and-down-gradient samples were collected to evaluate the lateral extent of potential constituent migration and to establish background concentrations for constituents in the vicinity of the SWMU 001L. These samples were collected from an undisturbed location, immediately up and down gradient, of the SWMU area. Up-gradient and down-gradient metals samples were collected at both the 12-24 inch and 60-72 inch depth. Background sample locations were selected by the sampling team members during the sampling visit. Sample locations were noted in the sample logbook and sampling location maps revised to identify up gradient and down gradient samples.

A tractor mounted power auger was used to drill an 8-inch diameter borehole to the appropriate sampling depth. A stainless tube sampler was used to collect a core sample for organic analytes from both the 12-24 inch and 60-72 inch depths. A disposable teflon scoop was generally used to collect metals constituent samples from the 12-24 inch depth. Metal constituent samples were collected in one liter (1000 ml) clear glass bottles with teflon lined lids. Volatile organic constituent samples were collected in 4 ounce (125 ml) clear glass bottles with welded septum lids.

FIGURE 3

SAMPLE LOCATION MAP SWMU 001L (WIPP-12 & P-5)



3.4 Data Quality Assurance

All sample analyses were completed in accordance with SW-846 or equivalent analytical protocols. Halliburton NUS Laboratory is the contract laboratory used to analyze all Release Assessment Samples. Sample analytical methods and Quality Assurance/Quality Control (QA/QC) requirements have been completed in accordance with the *Halliburton NUS Laboratory General Quality Assurance Plan*, March 10, 1995. The Halliburton QA plan defines all equipment calibration, sample handling, sample analyses, matrix blank, and method blank analyses required to meet SW-846 QA/QC requirements.

3.5 Independent Data Validation

An independent data quality review was completed by Harding Lawson & Associates (HLA) Engineering and Environmental Services. HLA developed the *Final Data Validation Procedure* to complete QA/QC data package reviews in accordance with the data quality requirements described in SW-846 and the *Halliburton NUS Laboratory General Quality Assurance Plan*. A copy of the HLA analytical data package for SWMU 001L is provided as Appendix 3.

3.6 Comparison of Analytical Results and EPA Action Levels at SWMU 001L

Appendix D of proposed *40 CFR § 264.521(d), FR Vol. 55, No. 145, VI(D), p.30870*, establishes criteria for selecting and calculating action levels for soils. Action level concentrations in Appendix D assume a chronic exposure through consumption of soil media contaminated with hazardous constituents. Criteria for establishing soil action levels can also be found in *40 CFR § 264.521(d), Appendix A*. The tables contained in Appendix A provide "Examples of Concentrations Meeting Criteria for Action Levels for Air, Water, and Soil Media." In order to complete Appendix D soil action level calculations, the DOE multiplied all TCLP concentrations by 20 (the estimated total concentrations in mg/kg) to obtain the intake assumption used in the Appendix D formula to compute the actual action level.

For all but one constituent contained in either Appendix A and Appendix D, analytical results demonstrate that sample constituent concentrations are below soil action levels. The only exceptions were constituent concentrations for Lead. The TCLP method detection limit for Lead at SWMU 001L varied from <0.05 mg/l to <0.5 mg/l. The variation in the method detection limit is attributed to matrix interference in the individual sample aliquots. Matrix interference is often associated with salt contained in the soils around the site. The range of sample constituent concentrations between up-gradient and down-gradient samples and samples collected in the mudpit areas are similar. The results of voluntary release assessment samples collected at SWMU 001L are provided in Table 8.

No action levels are established in Appendices A, D, or F for Barium, Benzene, Thallium or Vinyl Chloride tested at SWMU 001L. For these four analytes, only Barium was detected above the method detection limit.

TABLE 8

3 8 96

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 0011, WIPP-12

Bore Number:	BORE #4	BORE #4	BORE #5	BORE #5	BORE #6	BORE #6	FD BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95
WID Sample Numbers:	RA-95-252	RA-95-253	RA-95-254	RA-95-256	RA-95-258	RA-95-260	RA-95-262
			RA-95-255	RA-95-257	RA-95-259	RA-95-261	RA-95-263
Analytes							
Leachable Metals (mg/L)							
Arsenic (As)	0.1 U	0.1 UB	0.1 U	0.2 U	0.1 UB	0.2 U	0.1 U
Barium (Ba)	0.34	0.34	0.43	1.4	1.4	1.7	0.036
Cadmium (Cd)	0.005 U	0.005 U	0.005 U	0.02 UJ	0.005 UJ	0.02 UJ	0.005 UJ
Chromium (Cr)	0.02 U	0.02 U	0.02 U	0.04 U	0.02 U	0.04 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.05 U	0.1 U	0.05 U	0.1 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Thallium (Tl)	0.2 U	0.2 U	0.2 U	0.4 U	0.2 U	0.4 U	0.2 U
Leachable Volatiles (mg/L)							
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

TABLE 8
(cont.)

3 8 96

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 0011, Mudpit P-5

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	EQ BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95
WID Sample Numbers:	RA-95-240	RA-95-241	RA-95-242	RA-95-244	RA-95-248	RA-95-250	RA-95-246
			RA-95-243	RA-95-245	RA-95-249	RA-95-251	RA-95-247
Analytes							
Leachable Metals (mg/L)							
Arsenic (As)	0.1 U	0.1 UB	0.2 U	1 U	0.2 U	0.5 U	0.1 U
Barium (Ba)	0.68	0.83	1.1	1.3	1.3	1.5	0.033
Cadmium (Cd)	0.005 U	0.01 U	0.02 U	0.05 U	0.02 U	0.02 U	0.005 U
Chromium (Cr)	0.02 U	0.02 U	0.04 U	0.2 U	0.04 U	0.1 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.1 U	0.5 U	0.1 U	0.2 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Thallium (Tl)	0.2 U	0.2 U	0.4 U	2 U	0.4 U	1 U	0.2 U
Leachable Volatiles (mg/L)							
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected, value is method reporting limit
UB Detected in the blank and qualified as not detected

3.7 Evaluation of Selected Analytical Results Using Risk Based Concentrations

As previously discussed, the DOE used RBC levels developed by EPA Region III to evaluate analytical results for Barium, Benzene, Thallium, and Vinyl Chloride at SWMU 001L. These criteria appeared to most closely match the parameters established in Appendix D. The use of SSLs for transfers to groundwater are not appropriate at this site because geologic data demonstrate that any potential release to groundwater of constituents contained in the SWMU 001L mudpit is extremely remote.

The RBC soil concentration for Barium is 140,000 mg/kg, the analytical results for Barium at SWMU 001L ranged from 0.34 mg/l to 1.7 mg/l. These TCLP concentrations can be converted to total concentrations (mg/kg equivalent) by multiplying the TCLP concentration by 20. Thus, the total concentration equivalent for Barium analytes at SWMU 001L range from 6.8 mg/kg to 34.0 mg/kg, significantly below the 140,000 mg/kg RBC soil concentration.

Using the same methodology, the Region III RBC soil concentration for Benzene is 200 mg/kg. Benzene concentrations at SWMU 001x are all below the TCLP method detection limit of <0.05 mg/l. Converting the TCLP concentration to total concentrations, the total Benzene concentration for all samples at SWMU 001L is <1.0 mg/kg, significantly below the 200 mg/kg RBC soil concentration.

No RBC industrial soil ingestion concentration is provided in Table 1 for Thallium. Table 1 does provide a SSL concentration of 0.4 mg/kg for soil transfers to groundwater is provided. Thallium concentrations at SWMU 001H range from 0.2 mg/l to 2.0 mg/l, and each of these concentrations is categorized as below method detection limit. Selected Thallium samples were reanalyzed to obtain a lower detection limit. Reanalyzed sample concentrations ranged from <0.2 mg/l to <1.0 mg/l. This range of concentrations is attributed to matrix interferences. Although Thallium constituent concentrations are not as clearly defined as other constituents, geologic data from this site demonstrates that the release of hazardous constituents from the SWMU 001L mudpit to groundwater is extremely remote. Thus, soil screening concentrations have limited application at this site.

The RBC soil concentration for Vinyl Chloride is 3.0 mg/kg. TCLP analyses for Vinyl Chloride at all of the boreholes sampled at SWMU 001L had concentrations of <0.1 mg/l. Converting the TCLP concentration to total concentrations as described earlier, the total Vinyl Chloride concentration at all of the SWMU 001L boreholes is <2.0 mg/kg. Thus, the Vinyl Chloride concentration at all locations and depths are below both the method detection limit and the Region III Risk Based Concentrations for industrial soils.

3.8 Proposed Corrective Actions at SWMU 001L

Based on the criteria provided in proposed *40 CFR § 264.514 FR Vol. 55, No. 145, VI(D), p. 30813*, the voluntary release assessment analytical data collected at SWMU 001L demonstrates that no release of hazardous constituents has occurred. This data clearly demonstrates that there is no threat to human health or to the environment from drilling activities conducted at SWMU 001L and that additional RFI assessments are not required. In fact, thousands of similar mudpits exist immediately outside the WIPP boundary, and the regulations do not require additional corrective actions at these sites.

Because it is the EPA's intent to encourage voluntary corrective actions as described in the preamble of the Proposed Subpart S Rule, the DOE requests that after appropriate public review and agency approval, a No Further Action determination be granted for SWMU 001L prior to the issuance of the RCRA Part B Permit for the WIPP. If this determination is supported by both the EPA and NMED, this site will be replanted with native vegetation, in accordance with guidelines developed in the *WIPP Land Management Plan (DOE WIPP 93-004)*.

4.0 RESULTS OF RELEASE ASSESSMENT SAMPLING AT SWMU 001S

4.1 Location of SWMU 001s

This section of the release assessment data summary report documents the results of release assessment sampling at SWMU 001s, and describes the proposed corrective actions at this location. SWMU 001s is located in the SE ¼ of the SE ¼ of the SE ¼ of Section 20, Township 22 South, Range 31 East. The abandoned mudpits from the drilling of the ERDA-9 borehole comprises the 001s SWMU site. The ERDA-9 was drilled in 1976 by Sonora Drilling Company and International Diamond Coring, Inc., to a total depth of 2,889 feet.

ERDA-9 was the first WIPP exploratory borehole to test salt beds for the disposal of TRU wastes at the proposed WIPP site. The WIPP Hydrologic Data Report #5 states that salt-based drilling fluids were used for the first 1,033 feet. The well was then deepened to 2,877 feet using an oil-emulsion drilling mud, composed of diesel fuel, water, EZ MUD liquid emulsifier GELTONE viscofier, and Calcium Chloride. *Sandia Report SAND79-0270*, indicates that a proposed earthen emergency pit was constructed to support the closed-mud circulation system. A discolored rectangular zone was observed just to the north-northwest of the well head indicating that the emergency pit was used. The feature measured approximately 50 feet by 145 feet.

The ERDA-9 borehole was recompleted in October 1986, as a Culebra observation well. Recompletion work involved cutting the 7-inch casing in ERDA-9 at a depth of 980 feet with an explosive charge and removing the casing from the borehole. A 7-inch retrievable bridge plug was then installed inside the 10.75 inch casing at 760 feet from the top of the wellhead. The well was then flushed with approximately 13,200 gallons of fresh water, followed by 6,340 gallons of a .27 mg/l solution of MilChem-MD detergent-type degreaser (*Caufmann, et al. 1990*). A 1986 INTERA/Sandia National Laboratories memoranda documents that all detergent-laden rinse solutions were collected in surface frac tanks and transported to an offsite disposal facility.

The ERDA-9 mudpit area is transected by south WIPP security fence. During the sampling visit, the sampling team found no evidence of the ERDA-9 mudpit and used information contained in the WIPP RFA to survey in the mudpit location. The rectangular discolored zone identified in 1982 air photos is now partially covered by a railroad embankment and the compacted caliche used in the construction of the site. The drill pad where the ERDA-9 borehole and associated mudpit are located have been extensively graded and regraded.

4.2 Geology and Hydrogeology in the Area of SWMU 001s

The lithology logs contained in the Basic Data Report for Drillhole ERDA-9 (SAND79-0270) identify the near-surface deposits at the SWMU 001s as unconsolidated, light brown, very fine grained Eolian sands. These Holocene Aged sands overlay the Mescalero Caliche Formation and extend from the surface to 10 feet in depth. The Mescalero Caliche is well consolidated at this site and extends from 22-27 feet. Although the sampling team did not encounter consolidated caliche during the sampling visits, excavation of an NPDES storm water collection basin, approximately 120 feet south east of the mudpit area, confirmed the extent of the caliche zone at this site. During the excavation of the retention basin, Caterpillar tractors equipped with rippers were needed to penetrate the caliche formation.

The Gatuna Formation at SWMU 001s is approximately 27 feet thick. Lithology logs describe the Gatuna Formation at this site as very fine to fine grained, reddish-brown calcareous Pleistocene sandstone (SAND79-0270). The Gatuna Formation in the ERDA-9 borehole extends to a depth of 57 feet below surface and overlays the Santa Rosa Sandstone Formation. The Santa Rosa Formation is approximately 9 feet thick at this location.

Underlying the Santa Rosa Sandstone Formation is the Dewey Lake Redbed Formation. The Dewey Lake Redbed Formation in the ERDA-9 borehole is approximately 487 feet thick. The Dewey Lake Redbeds in this region are characterized as a deltaic sequence of alternating, thinly bedded siltstone and mudstone with lenticular interbeds of fine-to-coarse grained sandstone (Mercer, 1983; D'Appolonia 1982b).

The RFA describes the release potential to near-surface formations at SWMU 001s as high. The ERDA-9 Borehole Data Report describes 10 feet of sand and fill and 5 feet of chalky caliche underlain by Gatuna Formation. Although surface sands are extremely permeable, excavation in the area indicates that the Mescalero Caliche Formation at this site forms a good barrier to potential infiltration of constituents from the surface. Three minor spills of oil and diesel fuel created by the storage of earth moving equipment were discovered on a pad adjacent to the ERDA-9 drill pad during the excavation of the NPDES storm water retention basin.

Analysis of these spill sites demonstrate that the caliche zone effectively stopped the vertical migration of spilled materials. Additionally, analytical data collected from the ERDA-9 mudpit area documents that no release of constituents has occurred from the ERDA-9 mudpit. Release assessment sampling data indicates that with the exception of Barium, the constituent concentration of samples collected inside the mudpit area, and the concentrations of background samples, are below the SW-846 method detection limit concentrations. The mean TCLP Barium concentration at this location is .61 mg/l or 12.3 mg/kg total concentration equivalent. These concentrations are significantly below RBC table action level concentration of 140,000 mg/kg. The migration potential to groundwater at

this site is low relative to other locations onsite. The Dewey Lake Formation does not exhibit prodigious groundwater flow at this location, and migration to the Culebra Dolomite aquifer approximately 880 feet below the surface is not credible.

Once drilling of the ERDA-9 borehole was completed, the 10.75 inch casing was then perforated between 705 feet and 728 feet within the Culebra Dolomite Formation. The ERDA-9 well has been used as a water level monitoring well once the recompletion was completed in October 1986.

4.3 Sampling Protocols

A total of 16 soil samples were collected to characterize the vertical and horizontal extent of any potential release from the SWMU 001s. The NMED - DOE/WIPP Oversight Bureau collected an equal number of split samples at SWMU 001s.

A list of the number and type of samples collected by the DOE at SWMU 001s and the their associated sample intervals are provided in Table 9. The NMED - DOE Oversight Bureau archived the samples collected at SWMU 001s awaiting the results of DOE sampling. Because no anomalies were identified in the samples collected by the DOE, the NMED chose not to analyze the split samples collected at SWMU 001s.

The rationale for selecting sample depths at mudpits during the initial round of voluntary release assessment sampling was based on an evaluation of the 001s SWMU site and historical information contained in the RFA. Release assessment samples were collected from both the mudpit area and from up and down gradient locations. The long axis of the mudpit runs parallel to the south security fence and the WIPP railroad spur. The area sampled is approximately 15 feet south of the railroad embankment and approximately 3 feet inside the south security fence.

Organic and metal samples collected at the mudpit area at the 12-24 inch depth were used to provide a sample from the depth where the highest concentration of potential hazardous constituents were anticipated. Samples collected at the 60-72 inch depth were used to quantify the maximum vertical extent of potential contamination. No plastic liners were observed during the sampling of the ERDA-9 mudpit.

Up-gradient and down-gradient (background) samples were collected to evaluate the lateral extent of potential constituent migration and to establish background soil constituent concentrations in the vicinity of the SWMU 001s. These samples were collected from an undisturbed location, immediately up-and-down-gradient of both mudpit locations. Only metal constituent samples were collected from up-gradient and down-gradient sample locations at SWMU 001s. Metal constituent samples were collected at both the 12-24 inch

and 60-72 inch depths. Background sample locations were selected by the sampling team during the sampling visit. Sample locations were noted in the sample logbook, and sampling location maps were revised to reflect the location of up-gradient and down-gradient samples.

A tractor mounted power auger was used to drill an 8-inch diameter borehole to the appropriate sampling depth. A stainless tube sampler was used to collect a core sample for organic analytes from both the 12-24 inch and 60-72 inch depths. A disposable teflon scoop was generally used to collect metal constituent samples from the 12-24 inch depth. Metal constituent samples were collected in one liter (1000 ml) clear glass bottles with teflon lined lids. Volatile organic constituent samples were collected in 4 ounce (125 ml) clear glass bottles with welded septum lids. A revised sample location map for SWMU 001s is provided as Figure 4.

FIGURE 4

SAMPLE LOCATION MAP SWMU 001s (ERDA-9)

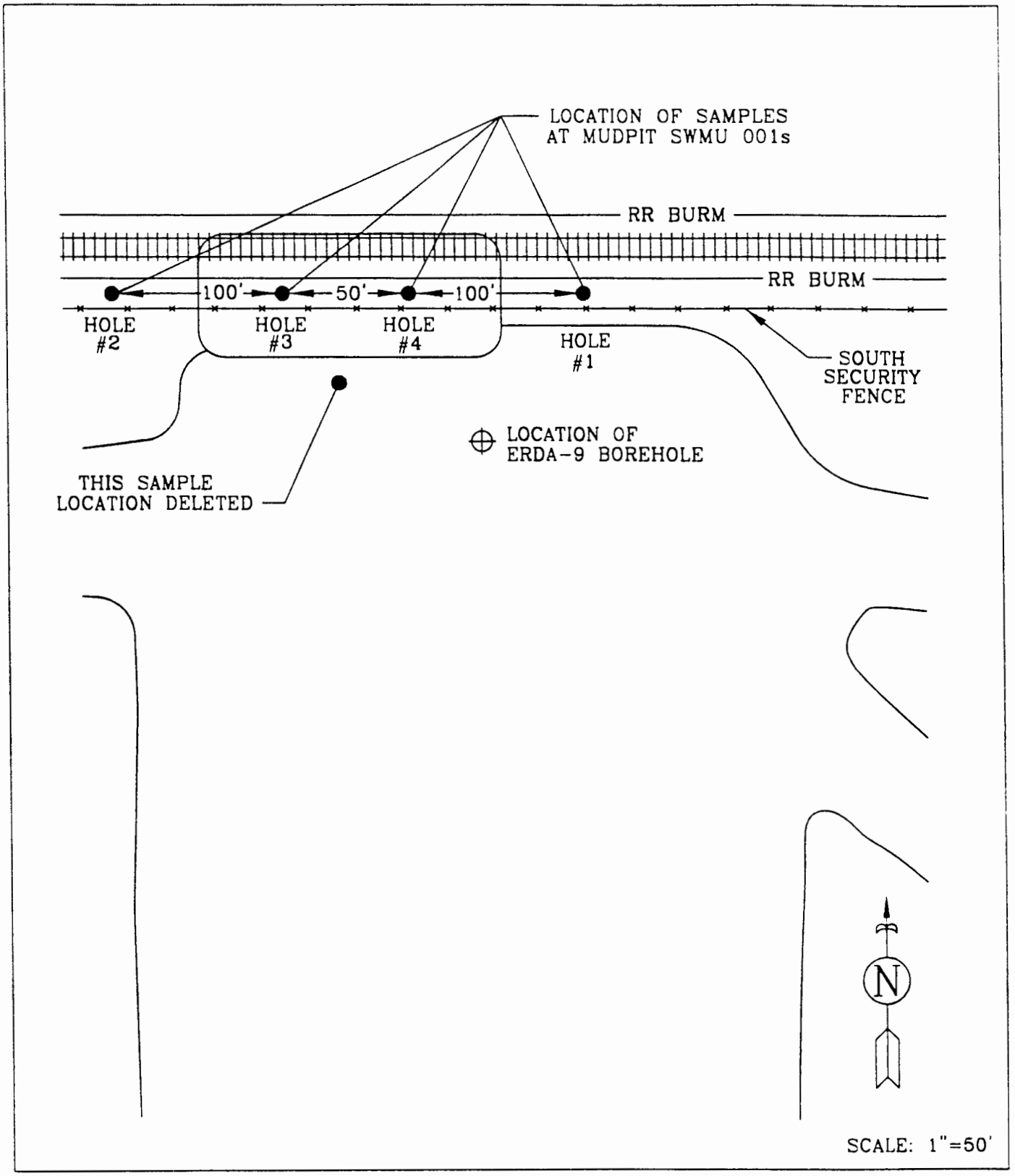


Table 9

SUMMARY OF THE NUMBER, TYPE, AND SAMPLING INTERVAL OF SAMPLES COLLECTED AT SWMU 001s (ERDA-9 Mudpit)		
	12 - 24"	**60 - 72"**
NUMBER OF SAMPLES:		
Inorganic Analysis	4	4
Organic Analysis	2	2
NUMBER OF DUPLICATE SAMPLES:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF EQUIPMENT BLANKS:		
Inorganic Analysis	1	0
Organic Analysis	1	0
NUMBER OF FIELD BLANKS:		
Inorganic Analysis	1	0
Organic Analysis	1	0

4.4 Data Quality Assurance

All sample analyses were completed in accordance with SW-846 or equivalent analytical protocols. Halliburton NUS Laboratory is the contract laboratory used to analyze all Release Assessment Samples. Sample analytical methods and Quality Assurance/Quality Control (QA/QC) requirements have been completed in accordance with the *Halliburton NUS Laboratory General Quality Assurance Plan*, March 10, 1995. The Halliburton QA plan defines all equipment calibration, sample handling, sample analyses, matrix blank, and method blank analyses required to meet SW-846 QA/QC requirements.

4.5 Independent Data Validation

Independent data quality review of samples collected by the DOE was completed by Harding Lawson & Associates (HLA) Engineering and Environmental Services. HLA developed a *Final Data Validation Procedure* to complete QA/QC data package reviews in accordance with the data quality requirements described in SW-846 and the *Halliburton NUS Laboratory General Quality Assurance Plan*. A copy of the independently reviewed analytical data package for samples collected by the DOE at SWMU 001s is provided as Appendix 4.

4.6 Comparison of Analytical Results and EPA Action Levels at SWMU 001s

Appendix D of proposed *40 CFR § 264.521(d), FR Vol. 55, No. 145, VI(D), p.30870,* establishes criteria for selecting and calculating action levels for soils. Action level concentrations in Appendix D assume a chronic exposure through consumption of soil media contaminated with hazardous constituents. Criteria for establishing soil action levels can also be found in *40 CFR § 264.521(d)*, Appendix A. The tables contained in Appendix A provide "Examples of Concentrations Meeting Criteria for Action Levels for Air, Water, and Soil Media." In order to complete Appendix D, soil action level calculations for samples collected at SWMU 001s, the DOE multiplied all TCLP concentrations by 20 (the total concentrations in mg/kg) to obtain the intake assumption used in the Appendix D formula to compute the actual action level.

For all constituents listed in Appendix A and Appendix D, analytical results demonstrate that sample constituent concentrations are all below soil action levels. The constituent concentration for Lead for all samples collected at SWMU 001s was <0.05 mg/l. This concentration is below the Maximum Contaminant Level (MCL) for Lead of 0.05 mg/l established in Appendix A. The results of voluntary release assessment samples collected at SWMU 001s are provided in Table 10.

No action levels are established in Appendices A, D, or F for Barium, Benzene, Thallium or Vinyl Chloride tested at SWMU 001s. For these analytes, only Barium was detected above the method detection limit. The constituent concentrations for these analytes collected inside the ERDA-9 mudpit area are similar background sample.

TABLE 10

3/8/96

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001s

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	12-24	60-72
Sample Date:	11/9/95	11/13/95	11/9/95	11/13/95	11/9/95	11/13/95	11/9/95	11/13/95
WID Sample Numbers:	RA-95-201	RA-95-264	RA-95-202	RA-95-265	RA-95-203	RA-95-266	RA-95-207	RA-95-268
					RA-95-204	RA-95-267	RA-95-208	RA-95-269
Analytes								
Leachable Metals (mg/L)								
Arsenic (As)	0.2 UB	0.2 U	0.2 UB	0.1 UB	0.1 UB	0.1 U	0.1 UB	0.1 U
Barium (Ba)	0.66	0.71	0.54	0.64	0.59	0.6	0.53	0.66
Cadmium (Cd)	0.01 U	0.02 UJ	0.005 U	0.01 UJ	0.005 U	0.01 UJ	0.005 U	0.005 UJ
Chromium (Cr)	0.02 U	0.04 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Lead (Pb)	0.05 U	0.1 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001	0.0004	0.0001 U	0.0004	0.0001 U	0.0003
Thallium (Tl)	0.2 U	0.4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Leachable Volatiles (mg/L)								
1,1,1-Trichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected, value is method reporting limit
UB Detected in the blank and qualified as not detected

TABLE 10
(cont.)

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001s

Bore Number:	EQ BLANK	EQ BLANK	FD BLANK
Depth (inches):			
Sample Date:	11/9/95	11/9/95	11/13/95
WID Sample Numbers:	RA-95-205	RA-95-206	RA-95-270
			RA-95-271
Analytes			
Leachable Metals (mg/L)			
Arsenic (As)	0.1 U	NA	0.1 U
Barium (Ba)	0.027	NA	0.051
Cadmium (Cd)	0.005 U	NA	0.005 UJ
Chromium (Cr)	0.02 U	NA	0.02 U
Lead (Pb)	0.05 U	NA	0.05 U
Mercury (Hg)	0.0001 U	NA	0.0001 U
Thallium (Tl)	0.2 U	NA	0.2 U
Leachable Volatiles (mg/L)			
1,1,1-Trichloroethane	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	0.05 U	0.05 U	0.05 U
Benzene	0.05 U	0.05 U	0.05 U
Chloroform	0.05 U	0.05 U	0.05 U
Ethyl benzene	0.05 U	0.05 U	0.05 U
Toluene	0.05 U	0.05 U	0.05 U
Vinyl chloride	0.1 U	0.1 U	0.1 U
Xylenes, total	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected, value is method reporting limit
UB Detected in the blank and qualified as not detected

4.7 Evaluation of Selected Analytical Results Using Risk Based Concentrations

The DOE used the RBC table to evaluate the analytical results for Barium, Benzene, Thallium, and Vinyl Chloride samples collected at SWMU 001s. These criteria appeared to most closely match the parameters established in Appendix D. The SSL for transfers to groundwater are not appropriate because geologic data demonstrates that any potential release of hazardous constituents from SWMU 001s to groundwater is extremely remote.

The RBC soil concentration for Barium is 140,000 mg/kg, analytical results for Barium in ERDA-9 mudpit range from 0.53 mg/l to 0.61 mg/l. These TCLP concentrations can be converted to total concentrations (mg/kg equivalent) by multiplying the TCLP concentration by 20. Thus, the total concentration equivalent for Barium analytes at the ERDA-9 mudpit range from 10.6 mg/kg to 12.3 mg/kg, significantly below the 140,000 mg/kg RBC soil concentration.

Using the same methodology, the Region III RBC soil concentration for Benzene is 200 mg/kg. Benzene concentrations at the ERDA-9 mudpit area are below the TCLP method detection limit of <0.05 mg/l. Converting the TCLP concentration to total concentrations, the total Benzene concentration for all samples at SWMU 001s is <1.0 mg/kg, significantly below the 200 mg/kg RBC soil concentration.

No RBC industrial soil ingestion concentration is provided in Table 1 for Thallium, however, an SSL for soil transfers to groundwater of 0.4 mg/kg is provided. As discussed earlier, geologic data demonstrates that the release of constituents from SWMU 001s to groundwater is extremely remote. Thus, a soil screening concentration has limited application at this site. Thallium analyses at SWMU 001s were all at a method detection limit, and ranged from <0.2 mg/l to <0.4 mg/l. The variation of method detection limits for Thallium is attributed to matrix interference generally caused by the high salt content associated with most samples collected at the WIPP. Specific discussion regarding matrix interferences is provided in the independent analytical data review contained in Appendix 4. No Risk Based soil concentration for Thallium is provided in the EPA Region III RBC table. However, TCLP analytical concentrations for samples collected inside the mudpit area and for up and down gradient background samples are below SW-846 method detection limits.

The RBC soil concentration for Vinyl Chloride is 3.0 mg/kg. TCLP concentration for Vinyl Chloride at all ERDA-9 sample locations is <0.1 mg/l. Converting the TCLP Vinyl Chloride concentration to total concentration, the total Vinyl Chloride concentration for all sample sites at SWMU 001s is <2.0 mg/kg. Thus, the Vinyl Chloride concentration for all samples collected at the SWMU 001s are below the Region III risk based concentration for industrial soils.

4.8 Proposed Corrective Actions at SWMU 001s

Based on the criteria provided in proposed *40 CFR § 264.514 FR Vol. 55, No. 145, VI(D), p. 30813*, the voluntary release assessment analytical data collected at SWMU 001s demonstrates that no release of hazardous constituents has occurred. This data clearly demonstrates that there is no threat to human health or to the environment from drilling activities conducted at the ERDA-9 borehole and that additional RFI assessments are not required. In fact, thousands of similar mudpits exist immediately outside the WIPP boundary, and the regulations do not require additional corrective actions at these sites.

Because it is the EPA's intent to encourage voluntary corrective actions as described in the preamble of the Proposed Subpart S Rule, the DOE requests that after appropriate public review and agency approval, a No Further Action determination be granted for SWMU 001s, prior to the issuance of the RCRA Part B Permit for the WIPP. If this determination is supported by both the EPA and NMED, this site will be replanted with native vegetation, in accordance with guidelines developed in the *WIPP Land Management Plan (DOE WIPP 93-004)*.

5.0 RESULTS OF RELEASE ASSESSMENT SAMPLING AT SWMU 003A

5.1 Location of SWMU 003a (formerly SWMU 004)

This section of the release assessment data summary report documents the results of release assessment sampling at SWMU 003a, the Portacamp Storage Area, and describes the proposed corrective actions at this location. The Portacamp Storage Area is an active materials storage area located in the E ½ of the NE ¼ of the NE ¼ of Section 29, Township 22 South, Range 31 East. The Portacamp Storage Area is primarily designed to store new parts and materials such as drums, pipe, and equipment. The Portacamp is also used to store and manage used hydraulic oil, used motor oil, used antifreeze, and discontinued oils prior to recycling or disposal at offsite facilities.

The 300 by 300 foot storage complex is surrounded by a locked, eight-foot chain-link fence. This complex is divided into two separately managed areas divided by an eight-foot, chain link fence. The west side of the Portacamp area is managed by Westinghouse, and the east side is managed by Sandia National Laboratories. Access to each area is limited to Westinghouse and Sandia materials control personnel, and the area is regularly patrolled by WIPP security.

The west side of the Westinghouse Portacamp area contains a 100 by 20 by 14 foot open-sided metal shed located in the southwest corner of the compound. Stored beneath this shed are new hazardous waste handling containers; operational and maintenance equipment; an electric transformer substation; and used oils and lubricants. Beginning in 1995, all used oils scheduled for recycling at an offsite facility were stored on spill control pallets under the metal shelter.

The southern half of the Westinghouse Portacamp area is used to store construction and maintenance materials such as steel stock, pipe, fencing materials, and mining timbers. The north central area was historically used as a holding area for nonhazardous waste waters and non-RCRA regulated oils awaiting appropriate disposal or reclamation. Labeled nonhazardous waste drums were historically stored on wooden pallets, which sat directly on the caliche pad. The site inspection revealed four small areas of surface discoloration on the caliche pad in and around the empty nonhazardous waste drum storage area. Digging in the area of the stained soil indicates that soil discoloration is confined to the top 6 to 8 inches of caliche, and the largest stain is approximately three feet in diameter.

The Sandia National Laboratory Portacamp area contains water well drilling materials and supplies, office equipment, air conditioning and mobile compressors, electric cable, and other construction and maintenance supplies used to support Sandia's activities. Concrete and grout materials are stored on pallets on the south end of the SNL Portacamp.

Adjacent to the gate at the north end are a series of buildings that contain various electrical equipment and supplies, as well as laboratory equipment. One potential issue observed by NMED personnel during the RFA site inspection was a styrofoam box containing a gallon of concentrated nitric acid and 3 quarts of concentrated hydrochloric acid. The containers were in the original, unopened shipping boxes. There was no indication of leakage, and both containers of acid have been removed and transported to an offsite disposal facility. There is no visual evidence of a release in or around the buildings or on the caliche pad.

5.2 Waste Management at the Portacamp Area

Equipment and nonhazardous and hazardous materials and wastes have been managed in the Portacamp area since 1976. Although the RFA states that RCRA waste management did not begin at the WIPP until the *RCRA Compliance Manual*, DOE/WIPP WP02-6/7, was issued in 1991, the WIPP actually began formalized management of hazardous materials and hazardous wastes in 1988. This was achieved with the issuance of the *WIPP Non-Radioactive Hazardous Waste Management*, DOE/WIPP WP02-601. In 1991 all RCRA compliance procedures and plans were later formalized into the WIPP *RCRA Compliance Manual*. WIPP spill response activities were proceduralized in 1988, with the issuance of the *WIPP Environmental Incident Reporting*, DOE/WIPP, WP02-506. These two procedures provided specific guidance for the management of hazardous wastes generated at the WIPP, as well as the identifying spill response and spill remediation requirements at the site.

Beginning in 1991, all RCRA regulated materials were managed in the WIPP Hazardous Waste Storage Area (Building 474-B). Used oil that contains one or more hazardous constituents are managed at the Hazardous Waste Staging Area located in Building 474-B.

5.3 Geology and Hydrogeology in the Area of SWMU 003a

No drilling or geologic characterization studies have been completed in the immediate area of the Portacamp Storage Area. However, a significant number of geologic and hydrogeologic assessments have been completed in the WIPP repository area. The Portacamp Storage Area is located approximately 800 feet south of the ERDA-9 borehole and the south security fence. Due to the proximity of the Portacamp Area to ERDA-9 borehole, the reader is directed to Section 4.2 of this report to obtain a geologic and hydrogeologic summary for the Portacamp Storage Area.

5.4 Sampling Protocols

A total of 32 soil samples were collected to characterize the vertical and horizontal extent of any potential release from the Portacamp Area. Twenty six samples were collected in the Westinghouse Portacamp Area, and six samples were collected in the Sandia Portacamp Area. Sampling at the Westinghouse Portacamp and Sandia Portacamp areas focused on both current and historic waste and material storage areas. Sampling in the Sandia Portacamp area will focus on the area where drilling additives are stored.

Grab samples were collected from the top 48 inches of the compacted caliche surface. Samples were collected from the 12-24 inch depth to characterize the area of maximum potential contamination at Portacamp Area. The samples collected from a 36-48 depth were designed to characterize the vertical extent of any potential release onto the compacted caliche storage pad. As described in the *Release Assessment Work Plan*, additional samples would be collected if stained soils were visible at the 48-inch sampling depth. During the Portacamp Area sampling visit, no stained or discolored soils were encountered.

Up-gradient samples were collected to evaluate the lateral extent of potential constituent migration and to establish background soil constituent concentrations in the vicinity of the Portacamp Area. These samples were collected from an undisturbed location, immediately up-gradient of the SWMU area. Up-gradient metals samples were collected at both the 12-24 inch and 36-48 inch depths. The background sample location was selected by the sampling team during the sampling visit. The sample location was noted in the sample logbook, and sampling location map was revised to reflect the location of up-gradient sample. A detailed Portacamp sample location map describing both the Westinghouse and Sandia Portacamp sampling locations is provided in Figure 5.

A tractor mounted power auger was used to drill an 8-inch diameter borehole to the appropriate sampling depth. A stainless tube sampler was used to collect a core sample for organic analytes from both the 12-24 inch and 36-48 inch depths. A disposable teflon scoop was used to collect metals constituent samples from the 12-24 inch depth. Metal constituent samples were collected in one liter (1000 ml) clear glass bottles with teflon lined lids. Volatile organic constituent samples were collected in 4 ounce (125 ml) clear glass bottles, and semivolatile samples were collected in 8 ounce (250 ml) clear glass bottles. Both the 125 ml and 250 ml glass bottles have welded septum lids. A list of the number and type of samples collected at SWMU 003a and their associated sample intervals are provided in Table 11.

FIGURE 5

SAMPLE LOCATION MAP SWMU 003a (PORTACAMP STORAGE AREA)

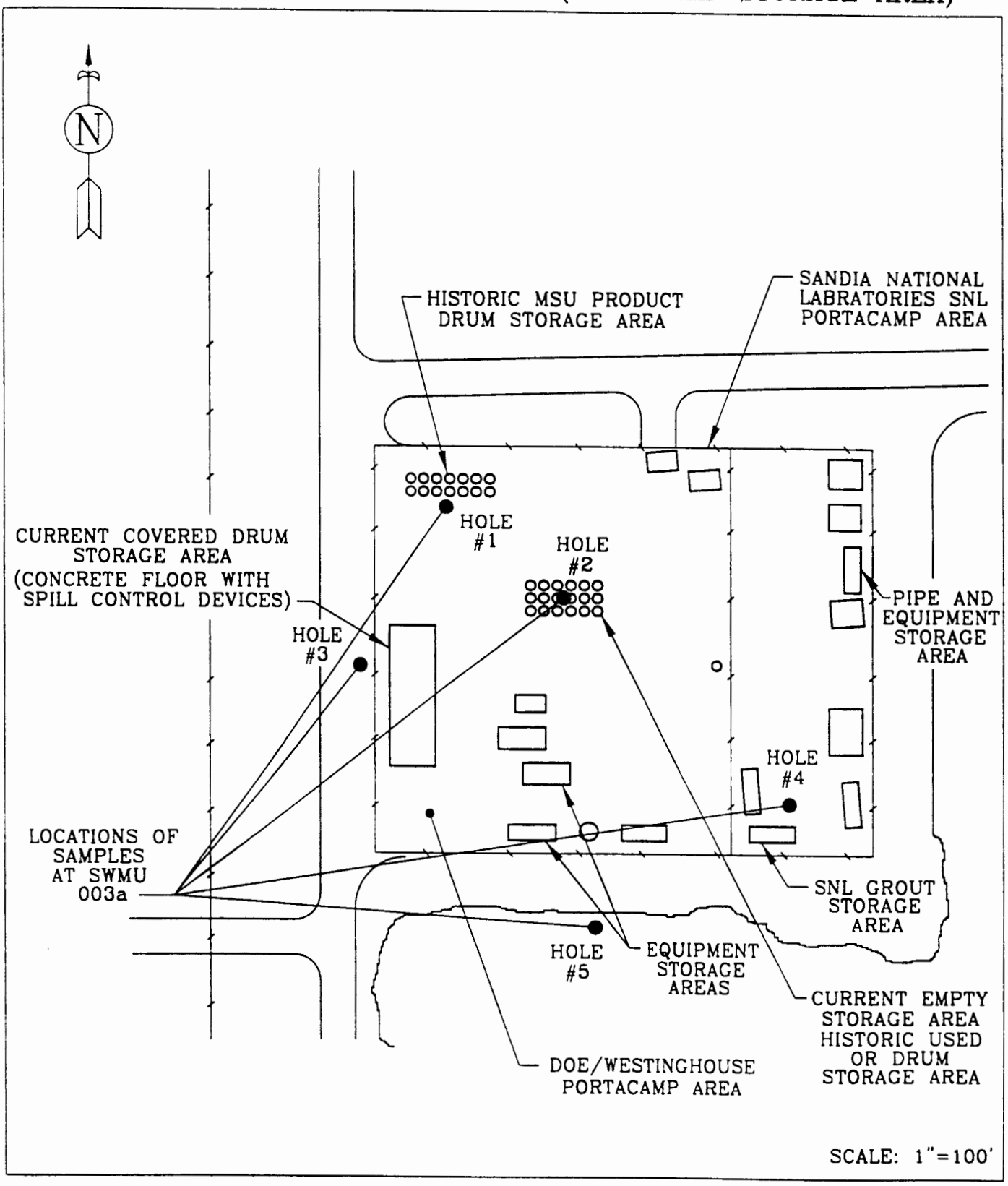


Table 11

SUMMARY OF THE NUMBER, TYPE, AND SAMPLING INTERVAL OF SAMPLES COLLECTED AT SWMU 003a (Portacamp Area)		
	12 - 24"	36 - 48"
NUMBER OF SAMPLES:		
Inorganic Analysis	5	5
Volatile Organic Analysis	4	4
Semivolatile Organic Analysis	4	4
NUMBER OF DUPLICATE SAMPLES:		
Inorganic Analysis	0	0
Organic Analysis	0	0
NUMBER OF EQUIPMENT RINSATE BLANKS:		
Inorganic Analysis	1	0
Volatile Organic Analysis	1	0
Semivolatile Organic Analysis	1	0
NUMBER OF FIELD BLANKS:		
Inorganic Analysis	1	0
Volatile Organic Analysis	1	
Semivolatile Organic Analysis	1	0

5.4.1 Data Quality Assurance

All sample analyses were completed in accordance with SW-846 or equivalent analytical protocols. Halliburton NUS Laboratory is the contract laboratory used to analyze all Release Assessment Samples. Sample analytical methods and Quality Assurance/Quality Control (QA/QC) requirements have been completed in accordance with the *Halliburton NUS Laboratory General Quality Assurance Plan*, March 10, 1995. The Halliburton QA plan defines all equipment calibration, sample handling, sample analyses, matrix blank, and method blank analyses required to meet SW-846 QA/QC requirements.

5.4.2 Independent Data Validation

Independent data quality validation was completed by Harding Lawson & Associates (HLA) Engineering and Environmental Services. HLA developed the *Final Data Validation Procedure* to complete QA/QC data package reviews in accordance with the data quality requirements described in SW-846 and the *Halliburton NUS Laboratory General Quality Assurance Plan*. A copy of the independently reviewed analytical data package for SWMU 003a is provided as Appendix 5.

5.5 Comparison of Analytical Results and EPA Action Levels at SWMU 003a

Appendix D of proposed *40 CFR § 264.521(d), FR Vol. 55, No. 145, VI(D), p.30870*, establishes criteria for selecting and calculating action levels for soils. Action level concentrations in Appendix D assume a chronic exposure through consumption of soil media contaminated with hazardous constituents. Criteria for establishing soil action levels can also be found in *40 CFR § 264.521(d)*, Appendix A. The tables contained in Appendix A provide "Examples of Concentrations Meeting Criteria for Action Levels for Air, Water, and Soil Media." In order to complete Appendix D, soil action level calculations for samples collected at SWMU 003a, the DOE multiplied all TCLP concentrations by 20 (the total concentrations in mg/kg) to obtain the intake assumption used in the Appendix D formula to compute the actual action level.

To characterize potential releases from SWMU 003a, a total of 10 metal constituents, 31 volatile constituents, 13 semivolatile constituents, and 6 PCBs were analyzed. Risk-based concentrations could be calculated for the following constituents contained in Appendix D: Acetone, Arsenic Bromoform (Tribromomethane), Cadmium, Carbon Tetrachloride, Chlorobenzene, Chloroform, 1,1 Dichloroethane, 1,1 Dichloroethylene (cis-1,2-Dichloroethene), 2,4-Dinitrophenol, Ethylbenzene, Hexachlorobutadiene, Hexachloroethane, Isobutyl Alcohol, Lead, Mercury, Methyl Ethyl Ketone, Methyl Isobutyl Ketone, Methylene Chloride, Nickel, Nitrobenzene, Pentachlorophenol, Pyridine, Silver, 1,1,2,2-Tetrachloroethane, Tetrachloroethylene (Tetrachloroethene), Toluene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene (Trichloroethene), 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, and Xylenes.

For all but one of the constituents listed in Appendix D, analytical results demonstrate that sample constituent concentrations are all below soil action levels. One Lead sample had an elevated detection limit, however, all samples analyzed at SWMU 003a were below the Lead method detection limit. The elevated detection limit of <0.2 mg/l was obtained for one of the 10 Lead samples tested at SWMU 003a. This elevated detection limit is attributed to matrix interference. All other samples collected at this site had a method detection limit of <0.05 mg/l. This concentration is below the Maximum Contaminant Level (MCL) for Lead of 0.05 mg/l established in Appendix A.

5.6 Evaluation of Selected Analytical Results Using Risk Based Concentrations

The DOE used the RBC concentrations for Industrial Soils to evaluate all of the remaining constituents for which a risk-based concentration could not be calculated using the tables contained *40 CFR § 264.521(d)*, Appendix A or Appendix D. As described in the Introduction of this Data Summary Report, the RBC table contains reference doses and carcinogenic potency slopes obtained from the Integrated Risk Information System (IRIS) through September 1, 1995, the Health Effect Assessment Summary Table (HEAST) through May 1995, and the EPA National Center for Environmental Assessment (NCEA) Superfund Health Risk constants. Constants have been combined with "standard" exposure scenarios to calculate RBCs.

The RBCs are chemical concentrations corresponding to fixed levels of risk (i.e., a hazard quotient of 1, or lifetime cancer risk of 10^{-6}, whichever occurs to a lower concentration) in water, air, fish tissue, and soil. The DOE selected the Industrial Soil Concentrations to evaluate the remaining SWMU 003a analytical because they appeared to most closely match the parameters established in Appendix D. The SSL for transfers to groundwater are not appropriate because geologic data demonstrates that any potential release of hazardous constituents from SWMU 003a to groundwater is extremely remote.

Those constituents evaluated using the EPA Region III RBC table include: Cyclohexanone, Ethyl Acetate, Trichlorofluoromethane, Vinyl Chloride, 2-Ethoxyethanol, Methanol, n-Butanol, 1,4-Dichlorobenzene, 2-Methylphenol, 3-Methylphenol, 4-Methylphenol, Barium, Selenium, Thallium, 1,1,2-Trichloro-1,2,2-trifluoroethane, Benzene, Hexachlorobenzene, and PCB-1242/1016, and PCB-1254. Analytical data indicates that none of these constituents exceeded the RBC table risk based concentration for industrial soils.

One leachable volatile constituent, Cyclohexane was not listed in either Appendix A or Appendix D of *40 CFR § 264.521(d),* or in the RBC table. All TCLP concentrations for Cyclohexane collected at SWMU 003a were qualified as "estimated" and below the method detection limit of 0.1 mg/l. Cyclohexane concentrations were listed as estimated because no initial or continuing calibration data is provided for Cyclohexane, but qualitative determinations could be made for Cyclohexane using the Gas Chromatograph/Mass Spectrometer (GC/MS) system.

Although no RBC concentration is provided for this common organic chemical, a RBC concentration is provided for Cyclohexanone. The RBC Industrial Soil Concentration for Cyclohexanone is 1E+06 mg/kg. The NIOSH threshold limit value (TLV) for Cyclohexanone is 25 ppm, or 25 mg/l. The NIOSH threshold limit value (TLV) for Cyclohexane is 300 ppm or 300 mg/l. Thus, the TLV concentration for Cyclohexanone is twelve times the TLV concentration for Cyclohexane. The SWMU analytical concentration for Cyclohexanone is approximately 1/1,000th the RBC risk-based concentration, and the Cyclohexane concentration is 1/5th the Cyclohexanone concentration. Thus, there is not potential for Cyclohexane to present a risk to human health or the environment. The results of voluntary release assessment samples collected at SWMU 003a are provided in Table 12.

TABLE 12

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	36-48	12-24	36-48	12-24	36-48	12-24	36-48
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-209	RA-95-211	RA-95-214	RA-95-217	RA-95-220	RA-95-224	RA-95-229	RA-95-232
	RA-95-210	RA-95-212	RA-95-215	RA-95-218	RA-95-221	RA-95-225	RA-95-230	RA-95-233
		RA-95-213	RA-95-216	RA-95-219	RA-95-222	RA-95-226	RA-95-231	RA-95-234
Analytes								
Leachable Metals (mg/L)								
Arsenic (As)	0.1 UB	0.1 UB	0.5 U	0.1 UB	0.1 UB	0.1 U	0.1 UB	0.1 U
Barium (Ba)	0.72	0.75	1.7	0.48	0.61	0.35	0.85	0.73
Cadmium (Cd)	0.01 U	0.01 U	0.02 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chromium (Cr)	0.02 U	0.02 U	0.1 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.2 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Nickel (Ni)	0.02 U	0.02 U	0.1 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Selenium (Se)	0.1 U	0.1 U	0.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Silver (Ag)	0.01 U	0.01 U	0.05 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Thallium (Tl)	0.2 U	0.2 U	1 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Leachable Volatiles (mg/L)								
1,1,1-Trichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Butanone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Acetone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Carbon tetrachloride	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chlorobenzene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

TABLE 12
(cont.)

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #5	BORE #5	EQ BLANK	FD BLANK
Depth (inches):	12-24	36-48		
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-235	RA-95-236	RA-95-223	RA-95-237
			RA-95-227	RA-95-238
			RA-95-228	RA-95-239
Analytes				
Leachable Metals (mg/L)				
Arsenic (As)	0.1 UB	0.1 U	0.1 U	0.1 U
Barium (Ba)	0.43	0.43	0.036	0.037
Cadmium (Cd)	0.005 U	0.005 U	0.005 U	0.005 U
Chromium (Cr)	0.02 U	0.02 U	0.02 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.05 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Nickel (Ni)	0.02 U	0.02 U	0.02 U	0.02 U
Selenium (Se)	0.1 U	0.1 U	0.1 U	0.1 U
Silver (Ag)	0.01 U	0.01 U	0.01 U	0.01 U
Thallium (Tl)	0.2 U	0.2 U	0.2 U	0.2 U
Leachable Volatiles (mg/L)				
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	NA	NA	0.05 U	0.05 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	NA	0.05 U	0.05 U
1,1,2-Trichloroethane	NA	NA	0.05 U	0.05 U
1,1-Dichloroethane	NA	NA	0.05 U	0.05 U
1,1-Dichloroethene	NA	NA	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U
2-Butanone	NA	NA	0.5 U	0.5 U
4-Methyl-2-pentanone	NA	NA	0.5 U	0.5 U
Acetone	NA	NA	0.5 U	0.5 U
Benzene	NA	NA	0.05 U	0.05 U
Carbon tetrachloride	NA	NA	0.05 U	0.05 U
Chlorobenzene	NA	NA	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U

TABLE 12
(cont.)
Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	36-48	12-24	36-48	12-24	36-48	12-24	36-48
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-209	RA-95-211	RA-95-214	RA-95-217	RA-95-220	RA-95-224	RA-95-229	RA-95-232
	RA-95-210	RA-95-212	RA-95-215	RA-95-218	RA-95-221	RA-95-225	RA-95-230	RA-95-233
		RA-95-213	RA-95-216	RA-95-219	RA-95-222	RA-95-226	RA-95-231	RA-95-234
Analytes								
Leachable Volatiles (mg/L)								
cis-1,2-Dichloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Cyclohexane	NA	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Cyclohexanone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethyl acetate	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Ethyl benzene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Tetrachloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Tribromomethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 UJ
Trichloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 UJ
Trichloroflouromethane	NA	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Vinyl chloride	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Ethoxyethanol	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Isobutanol	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methanol	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
n-Butanol	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Leachable Semivolatiles (mg/L)								
1,2-Dichlorobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1,4-Dichlorobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4,6-Trichlorophenol	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4-Dinitrotoluene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Methylphenol	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3/4-Methylphenol	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

TABLE 12
(cont.)

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #5	BORE #5	EQ BLANK	FD BLANK
Depth (inches):	12-24	36-48		
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-235	RA-95-236	RA-95-223	RA-95-237
			RA-95-227	RA-95-238
			RA-95-228	RA-95-239
Analytes				
Leachable Volatiles (mg/L)				
cis-1,2-Dichloroethene	NA	NA	0.05 U	0.05 U
Cyclohexane	NA	NA	0.1 UJ	0.1 UJ
Cyclohexanone	NA	NA	0.5 U	0.5 U
Ethyl acetate	NA	NA	0.1 U	0.1 U
Ethyl benzene	NA	NA	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U
Methylene chloride	NA	NA	0.05 U	0.05 U
Tetrachloroethene	NA	NA	0.05 U	0.05 U
Tribromomethane	NA	NA	0.05 U	0.05 U
Trichloroethene	NA	NA	0.05 U	0.05 U
Trichloroflouromethane	NA	NA	0.1 UJ	0.1 UJ
Vinyl chloride	NA	NA	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U
2-Ethoxyethanol	NA	NA	50 UJ	50 UJ
Isobutanol	NA	NA	10 UJ	10 UJ
Methanol	NA	NA	10 UJ	10 UJ
n-Butanol	NA	NA	10 UJ	10 UJ
Leachable Semivolatiles (mg/L)				
1,2-Dichlorobenzene	NA	NA	0.1 UJ	0.1 UJ
1,4-Dichlorobenzene	NA	NA	0.1 UJ	0.1 UJ
2,4,5-Trichlorophenol	NA	NA	0.5 UJ	0.5 UJ
2,4,6-Trichlorophenol	NA	NA	0.1 UJ	0.1 UJ
2,4-Dinitrotoluene	NA	NA	0.1 UJ	0.1 UJ
2-Methylphenol	NA	NA	0.1 UJ	0.1 UJ
3/4-Methylphenol	NA	NA	0.1 UJ	0.1 UJ

TABLE 12
(cont.)

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	36-48	12-24	36-48	12-24	36-48	12-24	36-48
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-209	RA-95-211	RA-95-214	RA-95-217	RA-95-220	RA-95-224	RA-95-229	RA-95-232
	RA-95-210	RA-95-212	RA-95-215	RA-95-218	RA-95-221	RA-95-225	RA-95-230	RA-95-233
		RA-95-213	RA-95-216	RA-95-219	RA-95-222	RA-95-226	RA-95-231	RA-95-234
Analytes								
Leachable Semivolatiles (mg/L)								
Hexachlorobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachloroethane	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nitrobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Pyridine	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Leachable PCBs (µg/L)								
PCB-1221	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1232	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1242/1016	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1248	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1254	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1260	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
PCB Polychlorinated biphenyls
R Rejected value
U Not detected, value is method reporting limit
UB Detected in the blank and qualified as not detected

TABLE 12
(cont.)

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #5	BORE #5	EQ BLANK	FD BLANK
Depth (inches):	12-24	36-48		
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-235	RA-95-236	RA-95-223	RA-95-237
			RA-95-227	RA-95-238
			RA-95-228	RA-95-239
Analytes				
Leachable Semivolatiles (mg/L)				
Hexachlorobenzene	NA	NA	0.1 UJ	0.1 UJ
Hexachlorobutadiene	NA	NA	0.1 UJ	0.1 UJ
Hexachloroethane	NA	NA	0.1 UJ	0.1 UJ
Nitrobenzene	NA	NA	0.1 UJ	0.1 UJ
Pentachlorophenol	NA	NA	0.5 UJ	0.5 UJ
Pyridine	NA	NA	0.1 UJ	0.1 UJ
Leachable PCBs (µg/L)				
PCB-1221	NA	NA	0.5 UJ	0.5 UJ
PCB-1232	NA	NA	0.5 UJ	0.5 UJ
PCB-1242/1016	NA	NA	0.5 UJ	0.5 UJ
PCB-1248	NA	NA	0.5 UJ	0.5 UJ
PCB-1254	NA	NA	0.5 UJ	0.5 UJ
PCB-1260	NA	NA	0.5 UJ	0.5 UJ

B Detected in the blank
EQ BLANK Equipment Rinse Blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
PCB Polychlorinated biphenyls
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

5.7 Proposed Corrective Actions at SWMU 003a

Based on the criteria provided in proposed *40 CFR § 264.514 FR Vol. 55, No. 145, VI(D), p. 30813*, the voluntary release assessment analytical data collected at SWMU 003a demonstrates that no release of hazardous constituents has occurred. This data clearly demonstrates that there is no threat to human health or to the environment from waste storage or materials management activities conducted at SWMU 003a and that additional RFI assessments are not required. In fact, thousands of similar mudpits exist immediately outside the WIPP boundary, and the regulations do not require additional corrective actions at these sites.

Because it is the EPA's intent to encourage voluntary corrective actions as described in the preamble of the Proposed Subpart S Rule, the DOE requests that after appropriate public review and agency approval, a No Further Action determination be granted for SWMU 003a prior to the issuance of the RCRA Part B Permit for the WIPP. If this determination is supported by both the EPA and NMED, this site will be replanted with native vegetation, in accordance with guidelines developed in the *WIPP Land Management Plan (DOE WIPP 93-004)*.

6.0 REQUEST FOR A DETERMINATION OF NO FURTHER ACTION AT SWMUS 002A AND 002B

6.1 Request for additional Information on SWMUs 002a and 002b

At a meeting held on August 8, 1995, the DOE provided copies of the *Voluntary Release Assessment/Corrective Action Work Plan for Solid Waste Management Units Located at the Waste Isolation Pilot Plant (WIPP)*, DOE/WIPP Draft 2115, to the EPA. The NMED participated in the August 8, 1995, meeting via teleconference to discuss the release assessment work plan. Copies of the Release Assessment Work Plan were provided to the NMED at a meeting held in Santa Fe on September 1, 1995. In Chapter 10.0 of the *Release Assessment Work Plan*, the DOE requested a formal determination that No Further Action was required at these sites. This request was based on information presented in the work plan which documented that the Brinderson and Construction Landfills had been permitted and closed in accordance with the requirements of the BLM operating permits and that No Further Action is required at these sites.

On December 19, 1995, the EPA submitted a letter providing formal comments on the *Release Assessment Work Plan*. On Pages 3 and 4 of this letter, the EPA requested additional information such as interviews, historical records, site inspections, site surveys, operating logs, and possibly assessment sampling to support a request for No Further Action at these site. The EPA also requested that the DOE demonstrate that no hazardous waste or hazardous constituents were placed in the Brinderson Landfill prior to the facility being permitted by the BLM. Additionally, the EPA stated that the NMED was working to develop a guidance document for making No Further Action determinations.

This section of the Release Assessment Data Summary Report will provide a brief history of the permitting activities associated with each site, and provide additional information to support the DOE's request for a No Further Action determination at these sites.

6.2 SWMU 002a (Brinderson Landfill) (formerly 003a)

On January 14, 1985, the BLM approved a Land Use Permit Application submitted by the DOE-Albuquerque Office to convert an existing caliche pit into a landfill. The Brinderson Landfill is located at the intersection of the NE ¼ of the NE ¼ of Section 32 and the NW ¼ of the NW ¼ of Section 33, Township 22 South, Range 31 East.

The Brinderson Landfill was used to accumulate and dispose of construction debris such as concrete and, scrap lumber. The Brinderson Landfill received monthly inspections by BLM Hazardous Material Specialists to ensure that the landfill area was managed and eventually closed in accordance with permit conditions. The Brinderson Landfill was officially closed on August 15, 1989, after final inspection and approval by BLM Hazardous Material and Realty Specialists.

6.3 SWMU 002b (Construction Landfill) (New Landfill/Inactive Landfill, formerly 003a)

On February 9, 1987, the BLM approved a Land Use Permit Application NM-067-LUP-237 to construct a new landfill for the disposal of construction debris at the WIPP. The Construction Landfill was built because the Brinderson Landfill was scheduled to be closed. The WIPP Construction Landfill is located at the N ½ of the NE ¼ of Section 29, Township 22 South, Range 31 East.

The Construction Landfill historically was made of two pit areas. Both pits were designed to accumulate and dispose of construction debris such as concrete and scrap lumber. The primary pit was closed and reclaimed in accordance with the permit requirements on February 15, 1990. The smaller secondary pit on the northwest side of the landfill area remains operational and is managed in accordance with Westinghouse/WIPP, *Construction Landfill Operations Procedure*, (WP06-108). This procedure provides administrative controls to limit the disposal of materials at the Construction Landfill to construction debris.

The facility was inspected on a monthly basis during operations by BLM hazardous material and realty personnel to ensure that materials disposed of met the criteria of the permit (e.g. the disposal of construction debris only).

6.4 Justification for a Determination that No Further Action is Required at SWMUS 002a and 002b

This section of the release assessment data summary report discusses the DOE's rational for requesting a formal determination that No Further Action is required for both the Brinderson Landfill (SWMU 002a) and Construction Landfill (SWMUs 002b). This request is based on information collected during voluntary release assessment activities as well as a summary of information not originally provided in the WIPP RFA.

After submittal of the Release Assessment Work Plan to the EPA and NMED, the DOE initiated a review of both DOE, BLM, and NMED landfill management records. The DOE also conducted interviews with both BLM and NMED personnel responsible for inspecting the Brinderson and Construction Landfills. This information was collected to demonstrate that no hazardous wastes or hazardous constituents were disposed in the landfills and to support the original request that No Further Action is required.

As described in Chapter 10 of *Voluntary Release Assessment/Corrective Action Work Plan*, the RFA does not disclose that both landfills were managed by the DOE in accordance with specific BLM permit conditions. The RFA does not describe the administrative controls such as limitations on the type of materials that could be disposed at the facility, and/or monthly inspections and reclamation/closure requirements established in the land-use permits.

In the preamble of the proposed Subpart S regulations, the EPA recognizes that releases or potential releases from SWMUs may be regulated under other permitting authority. As described in Section VI(B)(2) of proposed 40 CFR Part 264.501, "... EPA does not intend to utilize section 3004(u) corrective action authority to supervise or routinely re-evaluate such permitted releases." This section goes on to state, "However, in the course of investigating RCRA facilities for corrective action purposes, EPA may find situations where permitted releases from SWMUs have created threats to human health and the environment."

On December 7, 1995, the DOE conducted a meeting with Mr. James Goodbar, the BLM realty specialist responsible for the development of the Brinderson and Construction Landfill permits and the primary person responsible for completing quarterly inspections of both sites. In our discussion we asked three primary questions: (1) Were you aware of any debris, trash, or wastes in the caliche pit that was to be permitted as the Brinderson Landfill? (2) During your inspections, did you ever witness any disposal of materials not allowed under the provisions of the permits for the Construction or Brinderson Landfills? (3) Are you aware of any dumping of materials by persons not associated with WIPP operations in either of these landfill sites?

In the interview, Mr. Goodbar informed the DOE that no additional permit or inspection records beyond those provided to the DOE in May 1995 had been located. These records were provided in Appendix 2 and Appendix 3, of the *Voluntary Release Assessment/ Corrective Action Work Plan*. Mr. Goodbar went on to state that prior to the drafting the Land Use Permits for the Brinderson Landfill, BLM personnel inspected the site. The results of this inspection showed that two abandoned car bodies were located in the BLM's caliche pit. He went on to state that provision #2 of the WIPP Brinderson Landfill permit required that both car bodies be buried in a trench in the caliche pit, prior to the disposal of any construction debris at the site. Mr. Goodbar stated that no other evidence of disposal by non-WIPP personnel had occurred at the site. In summary, Mr. Goodbar stated that during his numerous inspections there was no evidence of the disposal of any materials not specifically allowed under the Land Use Permit (eg. construction debris).

On December 8, 1995, Mr. Goodbar submitted a letter to the DOE discussing his role as permit inspector and documenting that during his inspections he witnessed that only construction debris was disposed in the Brinderson and Construction Landfills. A copy of Mr. Goodbar's letter is provided in Appendix 6.

In early December 1995, the DOE contacted Mr. Jim Smith, an Environmentalist with the NMED in the Carlsbad Office, to request copies of records associated with inspections or permits for the WIPP Brinderson and Construction Landfills. On December 7, 1995, Mr. Smith was telephoned to ascertain if he had located any inspection records. The DOE was informed that files in both the Carlsbad and Roswell offices were reviewed, and no inspection records were located. Mr. Smith was then asked similar questions about his role in supporting the BLM with inspections of the Brinderson and Construction Landfill.

Mr. Smith explained that he had only participated in a couple of inspections with Jim Goodbar of the BLM. He stated that the NMED went on these inspections to review BLM operations and clarified that he was transferred to a different position with the NMED, so he did not participate in very many inspections. He also stated that the BLM had regulatory authority over this type of landfill operation and did not identify any problems during his inspections of either site. In closing Mr. Smith suggested that the DOE contact Mr. Goodbar for additional information about these sites. A copy of the telephone log for the DOE's conversation with Mr. Smith is provided in Appendix 6.

Information described in the permits and operating logs for both the Brinderson and Construction Landfills document that any potential releases from these facilities were managed under the provisions of the individual BLM permit. As described in the interviews with agency personnel, administrative controls such as monthly inspections and closure documentation provided by the BLM demonstrate that no potential threat to human health or the environment exists.

Permit closure documentation for both landfills indicates that, at the time of closure, the landfills were on BLM-managed property and were closed in accordance with BLM permit requirements. This position is further supported by the fact that the BLM Hazardous Materials Specialist inspected both facilities on a monthly basis and verified that only materials allowed under the BLM Land Use Permits were disposed in these landfills. Thus, any potential release from these SWMUs does not present a threat to human health and the environment. The DOE assumed operation and management of the remaining pit when the Land Use Permit expired on February 9, 1990. No additional permits were required to continue operation of the Construction Landfill because the facility is exempted from permitting requirements under Section 108 of the *New Mexico Solid Waste Management Regulations (EIB/SWMR-4)*.

6.5 DOE Management of the Brinderson and Construction Landfills

DOE records regarding the management of the Construction Landfill area date back to February, 1988. As discussed in the Release Assessment Work Plan, the DOE has operated the Construction Landfill in accordance with WIPP Procedure WP06-108, *Construction Landfill Operation*. Photographs showing the active Construction Landfill are provided in Figure 6. Photographs showing the reclamation of the closed portion of the Construction Landfill are provided in Figure 7. The operation of the WIPP Construction Landfill is the responsibility of the Westinghouse Hazardous Waste Management Section. The Construction Landfill Operations procedure requires that any generator of construction debris submit, and have approved, a Construction Debris Disposal Form. This form requires that the generator document the type and volume of debris destined for the landfill. Hazardous Waste

Figure 6

Photographs of the Active Construction Landfill

Figure 7

Photographs of Closed and Reclaimed Portion of the Construction Landfill

Management personnel then review the disposal request form, inspect the debris material, sign, and maintain all disposal records. Hazardous Waste Operations personnel also conduct periodic inspections of the landfill area. Similarly, the WIPP Environmental Compliance and Support Section conducts audits and inspections of the facility and associated disposal files. Additionally, berms and erosion protection at the facility are inspected on a quarterly basis as part of WIPP NPDES storm water permit compliance requirements. Copies of the Construction Debris Disposal Request Forms generated at the facility since February 1988 are contained in Appendix 7.

6.6 Proposed Corrective Actions at SWMUs 002a and 002b

Based on the new information provided in this release assessment data summary report and historical information contained in the Release Assessment Corrective Action Work Plan, the DOE requests a Determination of No Further Action be issued for both the Brinderson Landfill (SWMU 002a) and Construction Landfill (SWMU 002b). Because it is the EPA's intent to encourage voluntary corrective actions, the DOE requests that after appropriate public review, a No Further Action determination be issued prior to the issuance of the RCRA Part B Permit. If this determination is supported by both the EPA and NMED, the closed portion of the Construction Landfill site will be replanted with native vegetation, in accordance with guidelines developed in the *WIPP Land Management Plan*, DOE WIPP 93-004, January 1996.

This request is supported by several statements made in the proposed Subpart S regulations. In the preamble of the proposed Subpart S regulations, where the EPA recognizes that releases or potential releases from SWMUs may be regulated under other permitting authority. As described in Section VI(B)(2) of proposed 40 CFR Part 264.501, "... EPA does not intend to utilize section 3004(u) corrective action authority to supervise or routinely re-evaluate such permitted releases." Additionally, although proposed 40 CFR Part 264.514, "Determination of No Further Action," normally applies to releases from permitted facilities where remedial investigations have shown that releases are nonexistent or do not pose a threat to human health or the environment, the situation at the WIPP is slightly different. The WIPP RFA did not address the status of permits and administrative controls that existed to manage the Brinderson and Construction Landfills. These permits and administrative controls document that there have been no releases of regulated constituents from these units.

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APPENDIX 1

EPA Region III Risk-Based Concentration Table for the Period July 1995 - December 1995

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

October 20, 1995

SUBJECT: Risk-Based Concentration Table, July - December 1995

FROM: Roy L. Smith, Ph.D.
Office of RCRA
Technical & Program Support Branch (3HW70)

TO: RBC Table mailing list

Attached is the EPA Region III risk-based concentration (RBC) table, which we distribute semi-annually to all interested parties.

IMPORTANT MESSAGE

EPA Region III has established a homepage on the World Wide Web which you can find at http://earth1.epa.gov:80/ or http://www.epa.gov/. Our homepage will soon include the RBC table in downloadable form. We strongly encourage all RBC table users having Internet access to obtain the table electronically rather than on paper. In this way, users can obtain the most current issue immediately in a form that can be used directly as input for risk assessment calculations. This distribution method will also save large amounts of paper and cost substantially less.

For those lacking Internet access, it's once again time to re-register to receive a paper copy of the RBC table. We need to hear from you periodically to ensure that you still have an interest and that we have your correct address. Please fax your registration request to Vanessa Sizer at 215-597-9890, including your name, address, and phone number. Please don't phone to re-register; we need hard copy to document your continued interest. If we don't hear from you by March 30, 1996, we'll assume you no longer need a paper copy. Thanks for your cooperation.

CONTENTS, USES, AND LIMITATIONS OF THE RBC TABLE

The table contains reference doses and carcinogenic potency slopes (obtained from IRIS through September 1, 1995, HEAST through May 1995, the EPA-NCEA Superfund Health Risk Technical Support Center, and other EPA sources) for nearly 600 chemicals. These toxicity constants have been combined with "standard" exposure scenarios to calculate RBCs--chemical concentrations corresponding to fixed levels of risk (*i.e.*, a hazard quotient of 1, or lifetime cancer risk of 10^{-6}, whichever occurs at a lower concentration) in water, air, fish tissue, and soil.

The RBC table also includes soil screening levels (SSLs) for protection of groundwater

and air. Most SSLs were obtained directly from EPA/OSWER's proposed SSL guidance document, to which we have added some additional SSLs based on the same methodology. Sources of SSLs are noted in the table. SSLs incorporate the same exposure assumptions as RBCs, plus additional assumptions needed for inter-media extrapolation. SSLs are therefore distinct from RBCs, and should be used only in the framework proposed in the OSWER document (available from NTIS as document numbers 9355.4-1, PB95-965530, or EPA540/R-94/105).

The Region III toxicologists use RBCs to screen sites not yet on the NPL, respond rapidly to citizen inquiries, and spot-check formal baseline risk assessments. The background materials provide the complete basis for all the calculations, with the intent of showing users exactly how the RBCs were developed. Simply put, RBCs are risk assessments run in reverse. For a single contaminant in a single medium, under standard default exposure assumptions, the RBC corresponds to the target risk or hazard quotient.

RBCs also have several important limitations. Specifically excluded from consideration are (1) transfers from soil to air and groundwater, and (2) cumulative risk from multiple contaminants or media. Also, the toxicity information in the table has been assembled by hand, and (despite extensive checking and years of use) may contain errors. It's advisable to cross-check before relying on any RfDs or CPSs in the table. If you find any errors, please send me a note.

Many users want to know if the risk-based concentrations can be used as valid no-action levels or cleanup levels, especially for soils. The answer is a bit complex. First, it is important to realize that the RBC table does not constitute regulation or guidance, and should not be viewed as a substitute for a site-specific risk assessment. For sites where:

1. A single medium is contaminated;
2. A single contaminant contributes nearly all of the health risk;
3. Volatilization or leaching of that contaminant from soil is expected not to be significant;
4. The exposure scenarios used in the RBC table are appropriate for the site;
5. The fixed risk levels used in the RBC table are appropriate for the site; and
6. Risk to ecological receptors is expected not to be significant;

the risk-based concentrations would probably be protective as no-action levels or cleanup goals. However, to the extent that a site deviates from this description, as most do, the RBCs would not necessarily be appropriate.

To summarize, the table should generally not be used to (1) set cleanup or no-action levels at CERCLA sites or RCRA Corrective Action sites, (2) substitute for EPA guidance for preparing baseline risk assessments, or (3) determine if a waste is hazardous under RCRA.

ANSWERS TO FREQUENTLY ASKED QUESTIONS

To help you better understand the RBC table, here are answers to our most often-asked questions:

1. How can the age-adjusted inhalation factor (11.66) be less than either the inhalation rate for a child (12) or for an adult (20)?

Age-adjusted factors are not intake rates, but rather partial calculations which have different units than intake rates do. The fact that these partial calculations have values similar to intake rates is really coincidental, an artifact of the similar magnitude of years of exposure and time-averaged body weight.

2. Why does arsenic appear in the RBC table separately as a carcinogen and a non-carcinogen, while other contaminants do not?

Arsenic is double-entered to ensure that the risk assessor realizes that non-carcinogenic concerns are significant for arsenic. Otherwise, one might be tempted to accept a 1e-4 risk (37 ppm in residential soil), when the oral reference dose would be exceeded at 23 ppm.

Also, EPA has a little-known risk management policy for arsenic (dating from 1988) that suggests that arsenic-related cancer risks of up to 1e-3 can be accepted because the cancers are squamous cell carcinomas with a low mortality rate. Thus, noncarcinogenic RBCs represent an important limitation on acceptable arsenic concentrations.

3. Many contaminants have no inhaled reference dose or carcinogenic potency slope in IRIS, yet these numbers appear in the RBC table with IRIS given as the source. Where did the numbers come from?

Most inhaled reference doses and potency slopes in the RBC table are converted from reference concentrations and unit risk values which do appear in IRIS. These conversions assume 70-kg persons inhaling 20 m^3/d. For example, the inhalation unit risk for arsenic (4.3e-3 risk per $\mu g/m^3$) is divided by 20 m^3/d and multiplied by 70 kg times 1000 μg/mg, yielding a CPSi of 15.1 risk per mg/kg/d.

4. Why does the RBC table base soil RBCs for cadmium and manganese on reference doses that apply only to drinking water?

The RBC table's use of the drinking water RfDs for cadmium and manganese reflects (1) the limited space available in the already-crowded table, and (2) the intended use of the table as a screening tool rather than a source of cleanup levels (thereby making false positives acceptable). For a formal risk assessment, Region III would use the food RfDs for soil ingestion.

At this time, only two substances (as far as we know) have distinct oral RfDs for water and food--cadmium and manganese. Adding the two food RfDs to the table would require an entire column, which would be about 99.9% blank. The table has become so crowded that it would be difficult to accommodate another column. Also, we given this problem a relatively low

priority because the table's primary purpose is to identify environmental problems needing further study. RBCs were never intended for uncritical use as cleanup levels, merely to identify potential problems which need a closer look.

5. What is the source of the child inhalation rate of 12 m3/d?

The calculation comes from basic physiology. It's a scaling of the mass-specific 20 m3/d rate for adults from a body mass of 70 kg to 15 kg, using the 2/3 power of mass, as follows:

Let: IRcm = mass-specific child inhalation rate (m3/kg/d)
IRc = child inhalation rate (m3/d)

20 m3/d ÷ 70kg = 0.286 m3/kg/d (mass-specific adult inhalation rate)

$0.286 \text{ m3/kg/d} \times (70^{.67}) = (\text{IRcm}) \times (15^{.67})$

$\text{IRcm} = (0.286) \times (70^{.67}) \div (15^{.67}) = 0.286 \times 2.807 = 0.803 \text{ m3/kg/d}$

IRc = IRcm x 15kg = 0.803 m3/kg/d x 15kg = 12.04 m3/d

A short (but algebraically equivalent) way to do the conversion:

$20 \times (15 \div 70)^{.333} = 11.97$ (different from, but actually more correct than, 12.04 because of rounding error in the long form).

6. Can the oral RfDs in the RBC table be applied to dermal exposure?

Not directly. EPA's Office of Research and Development is working on dermal RfDs for some substances, but has not yet produced any final values. When dermal RfDs do appear, they will undoubtedly be based on absorbed dose rather than administered dose. Oral RfDs are (usually) based on administered dose and therefore tacitly include a GI absorption factor. Thus, any use of oral RfDs in dermal risk calculations would have to involve removing this absorption factor.

*7. The exposure variables table in the RBC background document lists the averaging time for non-carcinogens as "ED*365". What does that mean?*

ED is exposure duration, in years. Multiplying ED by 365 simply converts the duration to days. In fact, the ED term is included in both the numerator and denominator of the RBC algorithms for non-cancer risk, canceling it altogether. We expressed the algorithm this way to allow users to realize this. The total exposure is really corrected only by EF (days exposed per year) divided by 365. (Note that this explanation applies to noncarcinogenic risk only; for carcinogens, exposure is pro-rated over the number of days in a 70-year life span.)

8. Why is inorganic lead not included in the RBC table?

The reason lead is missing from the RBC table is simple, and fundamental: EPA has no

reference dose or potency slope for inorganic lead, so it wasn't possible to calculate risk-based concentrations. EPA considers lead a special case because:

(1) Lead is ubiquitous in all media, so human exposure comes from multiple sources. Comparing single-medium exposures with a reference dose would be misleading.

(2) If EPA did develop a reference dose for lead by the same methods other reference doses, we would probably find that most people already exceed it. Since EPA already knows this and is moving aggressively to lower lead releases nationally, such findings at individual sites would be irrelevant and unduly alarming.

(3) EPA decided to take a new approach to separate important lead exposures from trivial ones. EPA developed a computer model (the IEUBK model) which predicts children's blood lead concentrations using lead levels in various media as inputs. The idea is to evaluate a child's entire environment, and reduce lead exposures in the most cost-effective way.

On the practical side, there are several EPA policies which effectively substitute for RBCs. The EPA Office of Solid Waste has released a detailed directive on risk assessment and cleanup of residential soil lead. The directive recommends that soil lead levels less than 400 ppm be considered safe for residential use. Above that level, the document suggests collecting certain types of data and modeling children's blood lead with the IEUBK model. For the purposes of the RBC table, the de facto residential soil number would be 400 mg/kg. For water, we suggest 15 ppb (from the national EPA Action Level), and for air, the National Ambient Air Quality Standard.

9. Where did the potency slopes for carcinogenic PAHs come from?

The source of the potency slopes for PAHs is "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons", Final Draft, EPA Environmental Criteria and Assessment Office, Cincinnati, OH. It's available from NTIS as document number ECAO-CIN-842 (March, 1993). The slopes are expressed in terms of order-of-magnitude equivalence factors relating the compounds to benzo[a]pyrene; we have converted these TEQs to potency slopes to fit the format of the table.

10. May I please have a copy of the January 1991 RBC table?

We're sorry, but no. The RBC table doesn't represent regulation or guidance, so past issues should have no legal importance. Each time we update the table we destroy all obsolete copies, electronic and paper. We do this to ensure that only one set of RBCs, that based on current information, exists at any time.

11. I've noticed that some soil RBCs are 1 million parts per million. Since some of these substances are liquids, that's obviously ridiculous. What is that basis for these calculations?

A soil RBC of 1 million parts per million means that no amount of the contaminant in soil will cause a receptor to exceed the oral reference dose by incidental ingestion of soil. In

fact, some contaminants would have RBCs of more than 1 million ppm, but the algorithms cap concentrations at 100%. The reason we retain these admittedly impossible numbers is to let users see that the contaminant is not a threat via soil ingestion.

However, it's important to realize that the RBC calculations do not consider the potential of soil contaminants to leach to groundwater or escape to air by volatilization or dust entrainment. To consider these inter-media transfers, it's necessary to either monitor air and groundwater, or to use a model. Measured or modeled air and groundwater concentrations should then be compared to the RBCs for air and tap water.

We have begun to incorporate inter-media transfers into the RBC table in the form of soil screening levels (SSLs). However, EPA Headquarters has proposed only about a hundred SSLs so far, so the list is still rather short.

12. Please elaborate on the meaning of the 'W' source code in the table.

The "W" code means that a reference dose or potency slope for a contaminant is currently not present on either IRIS or HEAST, but that it once was present on either IRIS or HEAST and was removed. Such withdrawal usually indicates that consensus on the number no longer exists among EPA scientists, but not that EPA believes the contaminant to be unimportant. Older versions of the RBC table had separate codes for IRIS and HEAST withdrawals, but we changed to a single code for both because, after all, it hardly matters.

We retain withdrawn numbers in the table because we still need to deal with these contaminants during the sometimes very long delays before replacement numbers are ready. We take the position that for the purpose of screening an obsolete RBC is better than none at all. The 'W' code should serve as a clear warning that before making any serious decision involving that contaminant you will need to develop an interim value based on current scientific understanding.

If you are assessing risks at a site where a major contaminant is coded "W", consider working with your Regional EPA risk assessor to develop a current toxicity constant. If the site is being studied under CERCLA, the EPA-NCEA Regional Technical Support group may be able to assist.

13. Can I get copies of supporting documents for interim toxicity constants which are coded "E" in the RBC table?

Unfortunately, Region 3 does not have a complete set of supporting documents. The EPA-NCEA Superfund Health Risk Technical Support Center prepares these interim toxicity constants in response to site-specific requests from Regional risk assessors, and sends the documentation only to the requestor. The RBC tables contain only the interim values (those with "E" codes) that we've either requested ourselves or otherwise obtained copies of. There may be many more interim values of which we are unaware. Also, we don't receive automatic updates when NCEA revisits a contaminant, so it's likely that some interim values in the RBC table are obsolete.

It has been NCEA's policy to deny requests for documentation of interim toxicity constants. Although Region 3 has sometimes provided this documentation on request, for the above-stated reasons we have no assurance that the documentation, or even the interim numbers, are current. We've decided to discontinue distributing information that may be misleading. If one of the "E"-coded contaminants is a major risk contributor at your site, we strongly suggest that you work with EPA to develop an up-to-date reference dose or slope factor.

CHANGES IN THIS ISSUE OF THE RBC TABLE

New or revised EPA toxicity constants are now marked with "**" before the contaminant name. This is to help users quickly pick out substances with new RBCs. Formerly these contaminants were printed in underlined boldface type that copied badly. A new basis code, "M" for MCL, has been added to the upper right corner of each page. This code denotes soil screening levels for groundwater protection that are based on EPA Maximum Contaminant Levels.

If you want to raise issues or get answers to questions about the RBC table, please call the Technical Support Help Line at 215-597-1116. The line has a voice mail system to take your calls if we're not available. We'll return your call as soon as we can. Please limit calls to RBC issues; if you have a question about applying RBCs to a site, please call the EPA Regional office handling the project. Thanks for your help and cooperation, and we hope the RBC table continues to be a useful resource.

Attachment

EPA Region III Risk-Based Concentration Table

Background Information

Roy L. Smith, Ph.D.
Toxicologist
October 4, 1995

Development of Risk-Based Concentrations

General

Separate carcinogenic and non-carcinogenic risk-based concentrations were calculated for each compound for each pathway. The concentration in the table is the lower of the two, rounded to two significant figures. The following terms and values were used in the calculations:

Exposure variables	**Value**	**Symbol**
General:		
Carcinogenic potency slope oral (risk per mg/kg/d):	*	CPSo
Carcinogenic potency slope inhaled (risk per mg/kg/d):	*	CPSi
Reference dose oral (mg/kg/d):	*	RfDo
Reference dose inhaled (mg/kg/d):	*	RfDi
Target cancer risk:	1e-06	TR
Target hazard quotient:	1	THQ
Body weight, adult (kg):	70	BWa
Body weight, age 1-6 (kg):	15	BWc
Averaging time carcinogens (d):	25550	ATc
Averaging time non-carcinogens (d):	ED*365	ATn
Inhalation, adult (m3/d):	20	IRAa
Inhalation, child (m3/d):	12	IRAc
Inhalation factor, age-adjusted (m3-y/kg-d):	11.66	IFAadj
Tap water ingestion, adult (L/d):	2	IRWa
Tap water ingestion, age 1-6 (L/d):	1	IRWc
Tap water ingestion factor, age-adjusted (L-y/kg-d):	1.09	IFWadj
Fish ingestion (g/d):	54	IRF
Soil ingestion, adult (mg/d):	100	IRSa
Soil ingestion, age 1-6 (mg/d):	200	IRSc
Soil ingestion factor, age adjusted (mg-y/kg-d):	114.29	IFSadj
Residential:		
Exposure frequency (d/y):	350	EFr
Exposure duration, total (y):	30	EDtot
Exposure duration, age 1-6 (y):	6	EDc
Volatilization factor (L/m3):	0.5	K

Exposure variables	Value	Symbol
Occupational:		
Exposure frequency (d/y):	250	EFo
Exposure duration (y):	25	EDo
Fraction of contaminated soil ingested (unitless)	0.5	FC

*: Contaminant-specific toxicological constants. The priority among sources of toxicological constants was as follows: (1) IRIS, (2) HEAST, (3) HEAST alternative method, (4) EPA-NCEA Superfund Health Risk Technical Support Center, (5) withdrawn from IRIS or HEAST, and (6) other EPA documents. Each source was used only if numbers from higher-priority sources were unavailable. The EPA Superfund Health Risk Technical Support Center, part of the EPA National Center for Environmental Assessment in Cincinnati, develops provisional RfDs and CPSs on request for contaminants not in IRIS or HEAST. These provisional values are labeled "E = EPA-NCEA provisional" in the table. It is possible they may be obsolete. If one of the "E" constants is important to a Superfund risk assessment, consider requesting, through a Regional risk assessor, a new provisional value.

Age-adjusted factors

Because contact rates with tap water, ambient air, and residential soil are different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. These factors approximated the integrated exposure from birth until age 30 by combining contact rates, body weights, and exposure durations for two age groups - small children and adults. The age-adjusted factor for soil was obtained from RAGS IB; the others were developed by analogy.

Air inhalation

$$IFAadj \quad \frac{m^3 \cdot y}{kg \cdot d} = \frac{EDc \cdot IRAc}{BWc} + \frac{(EDtot - EDc) \cdot IRAa}{BWa}$$

Tap water ingestion

$$IFWadj \quad \frac{L \cdot y}{kg \cdot d} = \frac{EDc \cdot IRWc}{BWc} + \frac{(EDtot - EDc) \cdot IRWa}{BWa}$$

Soil ingestion

$$IFSadj \quad \frac{mg \cdot y}{kg \cdot d} = \frac{EDc \cdot IRSc}{BWc} + \frac{(EDtot - EDc) \cdot IRSa}{BWa}$$

Residential water

Volatilization terms were calculated only for compounds with a mark in the "VOC" column. Compounds having a Henry's Law constant greater than 10^{-5} were considered volatile. The list may be incomplete, but is unlikely to include false positives. The equations and the volatilization factor (K, above) were obtained from RAGS IB. Oral potency slopes and reference doses were used for both oral and inhaled exposures for volatile compounds lacking inhalation values. Inhaled potency slopes were substituted for unavailable oral potency slopes only for volatile compounds; inhaled RfDs were substituted for unavailable

oral RfDs for both volatile and non-volatile compounds. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

Carcinogens

$$RBC\ \frac{\mu g}{L} = \frac{TR \cdot ATc \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot ([K \cdot IFAadj \cdot CPSi] + [IFWadj \cdot CPSo])}$$

Non-carcinogens

$$RBC\ \frac{\mu g}{L} = \frac{THQ \cdot BWa \cdot ATn \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot EDtot \cdot \left(\frac{K \cdot IRAa}{RfDi} + \frac{IRWa}{RfDo}\right)}$$

Ambient air

Oral potency slopes and references were used where inhalation values were not available. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

Carcinogens

$$RBC\ \frac{\mu g}{m^3} = \frac{TR \cdot ATc \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot IFAadj \cdot CPSi}$$

Non-carcinogens

$$RBC\ \frac{\mu g}{m^3} = \frac{THQ \cdot RfDi \cdot BWa \cdot ATn \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot EDtot \cdot IRAa}$$

Edible fish

All RBCs were based on adult exposure.

Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot BWa \cdot ATc}{EFr \cdot EDtot \cdot \frac{IRF}{1000\ \frac{g}{kg}} \cdot CPSo}$$

Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFr \cdot EDtot \cdot \frac{IRF}{1000\ \frac{g}{kg}}}$$

Commercial/industrial soil ingestion

RBCs were based on adult occupational exposure, including an assumption that only 50% of total soil ingestion is work-related.

Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR\ BWa\ ATc}{EFo\ EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC \cdot CPSo}$$

Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ\ RfDo \cdot BWa \cdot ATn}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC}$$

Residential soil ingestion

RBCs for carcinogens were based on combined childhood and adult exposure; RBCs for non-carcinogens were based on childhood exposure only.

Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot ATc}{EFr \cdot \frac{IFSadj}{10^6\ \frac{mg}{kg}} \cdot CPSo}$$

Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ\ RfDo \cdot BWc \cdot ATn}{EFr \cdot EDc \cdot \frac{IRSc}{10^6\ \frac{mg}{kg}}}$$

Development of Soil Screening Levels

General

In December 1994 the EPA Office of Solid Waste and Emergency Response proposed Soil Screening Guidance (Document 9355.4-1, PB95-963530, EPA540/R-94/101, available through NTIS at 703-487-4650). This draft document provides (1) a framework in which soil screening levels are to be used, (2) a detailed methodology for calculating soil screening levels, and (3) soil screening levels for 107 substances.

Consistent with this new guidance, the risk-based concentration table now includes two columns of generic soil screening levels (SSLs). OSWER's 107 proposed soil screening levels have been added verbatim. In addition, the proposed SSL methodology has been used to calculate soil screening levels for more substances, which are also included in the

new table. The table clearly distinguishes the OSWER SSLs from the "unofficial" ones.

These SSLs provide reasonable maximum estimates of transfers of contaminants from soil to other media. One column contains soil concentrations protective of groundwater quality; the other contains soil concentrations protective of air quality. "Protective" is defined in the same terms as the risk-based concentrations for tap water and air -- that residential contact scenarios will yield a fixed upper bound risk of 10^{-6} or a fixed hazard quotient of 1 (whichever occurs at the lower concentration).

OSWER's SSLs should be used only within the framework proposed in the guidance document. The additional SSLs included in the RBC table are intended for the same uses (although they obviously carry less weight than the formally proposed numbers).

The SSLs are based on the following assumptions:

Input variables	Value	Symbol*
Surface soil moisture content (g/g)	0.1	W_s
Vadose zone soil moisture content (kg/kg)	0.2	W_v
Surface soil bulk density (g/cm^3)	1.5	ρ_{bs}
Vadose zone soil bulk density (kg/L)	1.5	ρ_{bv}
Surface soil particle density (g/cm^3)	2.65	ρ_{ss}
Vadose zone soil particle density (g/cm^3)	2.65	ρ_{sv}
Total surface soil porosity (L pore /L soil)	0.43	N_s
Total vadose zone soil porosity (L pore/L soil)	0.43	N_v
Air-filled surface soil porosity (L air/L soil)	0.28	θ_{as}
Water-filled surface soil porosity (L water/L soil)	0.15	θ_{ws}
Air-filled vadose zone soil porosity (L air/L soil)	0.13	θ_{av}
Water-filled vadose zone soil porosity (L water/L soil)	0.30	θ_{wv}
Organic carbon fraction of surface soil (g/g)	0.006	FOC_s
Organic carbon fraction of vadose zone soil (g/g)	0.002	FOC_v
Dispersion factor for 0.5 acres (g/m^{2}s per kg/m^3)	35.1	Q/C
Particulate emission factor (m^3/kg)	6.79e+08	PEF
Exposure interval (s)	9.50e+08	T
Dilution-attenuation factor (unitless)	10	DAF

*: Symbols were adjusted, variables were rearranged, and derived and chemical-specific variables were omitted for simplicity and clarity. Presentation of the input variables in a single table using the same terms as in the OSWER SSL document would have been confusing. The terms used here are generally similar to OSWER's, and can easily be compared with the SSL guidance document.

With two exceptions described in the following section, SSL calculations were based on the same algorithms presented in the OSWER draft SSL guidance document. For details of the calculations (and for general background information on SSLs), I strongly recommend

consulting that document. The "unofficial" SSLs were developed under the following conditions:

Soil Screening Levels for Inhalation

Inhaled reference doses and potency slopes were used if available. If inhalation values were not available, oral RfDs and potency slopes were substituted. SSLs were calculated only for substances for which aqueous solubility, Koc, Henry's Law constant, and diffusivity in air were available. SSLs were calculated only for substances for which a volatilization factor could be calculated. This was done because OSWER's large proposed particulate emission factor rendered it pointless to estimate SSLs for particulate emissions alone. The final calculated SSL shown in the RBC table is the smaller of the risk-based SSL and the soil saturation concentration. All calculated SSLs were rounded to 2 significant figures.

The OSWER risk algorithms for inhalation were revised in order to be consistent with the rest of the RBC table. Only calculated SSLs were affected by this; SSLs proposed by OSWER are presented verbatim. Calculated SSLs for inhalation of carcinogens were based on an integrated lifetime exposure rather than adult exposure. SSLs for inhalation of noncarcinogens were based on adult exposure for 350 days per year rather than 365 days per year. The following algorithms were used to calculate inhalation SSLs:

Carcinogens

$$SSL \ \frac{mg}{kg} = \frac{TR \cdot ATc}{EFr \cdot IFAadj \cdot \left(\frac{1}{VF} + \frac{1}{PEF}\right) \cdot CPSi}$$

Non-carcinogens

$$SSL \ \frac{mg}{kg} = \frac{THQ \cdot BWa \cdot ATn \cdot RfDi}{EFr \cdot EDtot \cdot IRAa \cdot \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

Soil Screening Levels for Groundwater Use

All algorithms were as proposed by OSWER. MCLs were used as target groundwater concentrations if available. If MCLs were unavailable the risk-based concentration in the "tap water" column of the RBC table was used as the target groundwater concentration. All SSLs for groundwater are based on a dilution-attenuation factor (DAF) of 10. Since these SSLs scale linearly with DAF, the SSLs for DAF=1 would be ten times lower. They were omitted to conserve space. All groundwater SSLs were rounded to 2 significant figures and capped at unity.

Sources: I=IRIS H=HEAST A=HEAST alternate W=Withdrawn from IRIS or HEAST E=EPA-NCEA Regional Support provisional value O=Other EPA documents.

Basis: C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg·d/mg	CPSi kg·d/mg	VOC	Risk-Based Concentrations: Tap Water µg/L	Ambient Air µg/m3	Fish mg/kg	Soil Ingestion: Industrial mg/kg	Residential mg/kg	Soil Screening Levels-Transfers from Soil to: Air mg/kg	Groundwater mg/kg
Acephate	30560191	4.00E-03 I		8.70E-03 I			7.7 C	0.72 C	0.36 C	660 C	73 C		
Acetaldehyde	75070		2.57E-03 I		7.70E-03 I		94 N	0.81 C					
Acetochlor	34256821	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Acetone	67641	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N	62000 E	8 E
Acetone cyanohydrin	75865	7.00E-02 H	4.00E-02 A				2600 N	150 N	95 N	140000 N	5500 N		
Acetonitrile	75078	6.00E-03 I	1.43E-02 A				220 N	52 N	8.1 N	12000 N	470 N		
Acetophenone	98862	1.00E-01 I	5.71E-06 W			☒	0.042 N	0.021 N	140 N	200000 N	7800 N		
Acifluorfen	62476599	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Acrolein	107028	2.00E-02 H	5.71E-06 I				730 N	0.021 N	27 N	41000 N	1600 N		
Acrylamide	79061	2.00E-04 I		4.50E+00 I	4.55E+00 I		0.015 C	0.0014 C	0.0007 C	1.3 C	0.14 C		
Acrylic acid	79107	5.00E-01 I	2.86E-04 I				18000 N	1 N	680 N	1E+06 N	39000 N		
Acrylonitrile	107131	1.00E-03 H	5.71E-04 I	5.40E-01 I	2.38E-01 I		0.12 C	0.026 C	0.0058 C	11 C	1.2 C		
Alachlor	15972608	1.00E-02 I		8.00E-02 H			0.84 C	0.078 C	0.039 C	72 C	8 C		
Alar	1596845	1.50E-01 I					5500 N	550 N	200 N	310000 N	12000 N		
Aldicarb	116063	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N	570 S	0.036 M
Aldicarb sulfone	1646884	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Aldrin	309002	3.00E-05 I		1.70E+01 I	1.71E+01 I		0.001 C	0.00037 C	0.00019 C	0.34 C	0.038 C	0.5 E	0.005 L
Ally	74223646	2.50E-01 I					9100 N	910 N	340 N	510000 N	20000 N		
Allyl alcohol	107186	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Allyl chloride	107051	5.00E-02 W	2.86E-04 I				1800 N	1 N	68 N	100000 N	3900 N		
Aluminum	7429905	1.00E+00 E					37000 N	3700 N	1400 N	1E+06 N	78000 N		
Aluminum phosphide	20859738	4.00E-04 I					15 N	1.5 N	0.54 N	820 N	31 N		
Amdro	67485294	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N		
Ametryn	834128	9.00E-03 I					330 N	33 N	12 N	18000 N	700 N		
m-Aminophenol	591275	7.00E-02 H					2600 N	260 N	95 N	140000 N	5500 N		
4-Aminopyridine	504245	2.00E-05 H					0.73 N	0.073 N	0.027 N	41 N	1.6 N		
Amitraz	33089611	2.50E-03 I					91 N	9.1 N	3.4 N	5100 N	200 N		
Ammonia	7664417		2.86E-02 I				1000 N	100 N					
Ammonium sulfamate	7773060	2.00E-01 I					7300 N	730 N	270 N	410000 N	16000 N		
Aniline	62533		2.86E-04 I	5.70E-03 I			10 N	1 N	0.55 C	1000 C	110 C	45 N	0.031 N
Antimony and compounds	7440360	4.00E-04 I					15 N	1.5 N	0.54 N	820 N	31 N		
Antimony pentoxide	1314609	5.00E-04 H					18 N	1.8 N	0.68 N	1000 N	39 N		
Antimony potassium tartrate	304610	9.00E-04 H					33 N	3.3 N	1.2 N	1800 N	70 N		
Antimony tetroxide	1332316	4.00E-04 H					15 N	1.5 N	0.54 N	820 N	31 N		
Antimony trioxide	1309644	4.00E-04 H					15 N	1.5 N	0.54 N	820 N	31 N		
Apollo	74115245	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Aramite	140578	5.00E-02 H		2.50E-02 I	2.49E-02 I		2.7 C	0.25 C	0.13 C	230 C	26 C		
Arsenic	7440382	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N	380 E	15 E
**Arsenic (as carcinogen)	7440382			1.50E+00 I	1.51E+01 I		0.045 C	0.00041 C	0.0021 C	3.8 C	0.43 C	380 E	15 E

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Arsine	7784421		1.43E-05 I				0.52 N	0.052 N					
Assure	76578148	9.00E-03 I					330 N	33 N	12 N	18000 N	700 N		
Asulam	3337711	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Atrazine	1912249	3.50E-02 I		2.22E-01 H			0.3 C	0.028 C	0.014 C	26 C	2.9 C		
Avermectin B1	65195553	4.00E-04 I					15 N	1.5 N	0.54 N	820 N	31 N		
Azobenzene	103333			1.10E-01 I	1.08E-01 I		0.61 C	0.058 C	0.029 C	52 C	5.8 C		
Barium and compounds	7440393	7.00E-02 I	1.43E-04 A				2600 N	0.52 N	95 N	140000 N	5500 N	350000 E	32 E
Baygon	114261	4.00E-03 I					150 N	15 N	5.4 N	8200 N	310 N		
Bayleton	43121433	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
Baythroid	68359375	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Benefin	1861401	3.00E-01 I					11000 N	1100 N	410 N	610000 N	23000 N		
Benomyl	17804352	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Bentazon	25057890	2.50E-03 I					91 N	9.1 N	3.4 N	5100 N	200 N		
Benzaldehyde	100527	1.00E-01 I				☒	610 N	370 N	140 N	200000 N	7800 N		
Benzene	71432		1.71E-03 E	2.90E-02 I	2.90E-02 I	☒	0.36 C	0.22 C	0.11 C	200 C	22 C	0.5 E	0.02 E
Benzenethiol	108985	1.00E-05 H					0.37 N	0.037 N	0.014 N	20 N	0.78 N		
Benzidine	92875	3.00E-03 I		2.30E+02 I	2.35E+02 I		0.00029 C	0.00003 C	0.00001 C	0.025 C	0.0028 C	1.3 C	1.100E-06 C
Benzoic acid	65850	4.00E+00 I					150000 N	15000 N	5400 N	1E+06 N	310000 N	320 E	280 E
Benzotrichloride	98077			1.30E+01 I			0.0052 C	0.00048 C	0.00024 C	0.44 C	0.049 C	0.012 C	0.000073 C
Benzyl alcohol	100516	3.00E-01 H					11000 N	1100 N	410 N	610000 N	23000 N		
Benzyl chloride	100447			1.70E-01 I		☒	0.062 C	0.037 C	0.019 C	34 C	3.8 C	0.5 C	0.00036 C
Beryllium and compounds	7440417	5.00E-03 I		4.30E+00 I	8.40E+00 I		0.016 C	0.00075 C	0.00073 C	1.3 C	0.15 C	690 E	180 E
Bidrin	141662	1.00E-04 I					3.7 N	0.37 N	0.14 N	200 N	7.8 N		
Biphenthrin (Talstar)	82657043	1.50E-02 I					550 N	55 N	20 N	31000 N	1200 N		
1,1-Biphenyl	92524	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N	9000 E	110 N
Bis(2-chloroethyl)ether	111444			1.10E+00 I	1.16E+00 I	☒	0.0092 C	0.0054 C	0.0029 C	5.2 C	0.58 C	0.3 E	0.0003 E
Bis(2-chloroisopropyl)ether	39638329	4.00E-02 I		7.00E-02 H	3.50E-02 H	☒	0.26 C	0.18 C	0.045 C	82 C	9.1 C		
Bis(chloromethyl)ether	542881			2.20E+02 I	2.17E+02 I	☒	0.00005 C	0.00003 C	0.00001 C	0.026 C	0.0029 C	0.00004 C	1.000E-07 C
Bis(2-chloro-1-methylethyl)ether				7.00E-02 W	7.00E-02 W		0.96 C	0.089 C	0.045 C	82 C	9.1 C		
Bis(2-ethylhexyl)phthalate (DEHP)	117817	2.00E-02 I		1.40E-02 I			4.8 C	0.45 C	0.23 C	410 C	46 C	210 E	11 E
Bisphenol A	80057	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Boron (and borates)	7440428	9.00E-02 I	5.71E-03 H				3300 N	21 N	120 N	180000 N	7000 N		
Boron trifluoride	7637072		2.00E-04 H				7.3 N	0.73 N					
Bromodichloromethane	75274	2.00E-02 I		6.20E-02 I		☒	0.17 C	0.1 C	0.051 C	92 C	10 C	1800 E	0.3 E
Bromoethene	593602				1.10E-01 H	☒	0.096 C	0.057 C					
Bromoform (tribromomethane)	75252	2.00E-02 I		7.90E-03 I	3.85E-03 I	☒	2.4 C	1.6 C	0.4 C	720 C	81 C	46 E	0.5 E
Bromomethane	74839	1.40E-03 I	1.43E-03 I			☒	8.7 N	5.2 N	1.9 N	2900 N	110 N	2 E	0.1 E
4-Bromophenyl phenyl ether	101553	5.80E-02 O					2100 N	210 N	78 N	120000 N	4500 N		
Bromophos	2104963	5.00E-03 H					180 N	18 N	6.8 N	10000 N	390 N		

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Bromoxynil	1689845	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Bromoxynil octanoate	1689992	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
1,3-Butadiene	106990				9.80E-01 I	☒	0.011 C	0.0064 C				0.0013 C	0.000072 C
1-Butanol	71363	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N	9700 E	8 E
Butyl benzyl phthalate	85687	2.00E-01 I					7300 N	730 N	270 N	410000 N	16000 N	530 E	68 E
Butylate	2008415	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
sec-Butylbenzene	135988	1.00E-02 E				☒	61 N	37 N	14 N	20000 N	780 N	80 S	0.27 M
tert-Butylbenzene	104518	1.00E-02 E				☒	61 N	37 N	14 N	20000 N	780 N		0.27 M
Butylphthalyl butylglycolate	85701	1.00E+00 I					37000 N	3700 N	1400 N	1E+06 N	78000 N		
Cacodylic acid	75605	3.00E-03 H					110 N	11 N	4.1 N	6100 N	230 N		
**Cadmium and compounds	7440439	5.00E-04 I	5.71E-05 E		6.30E+00 I		18 N	0.00099 C	0.68 N	1000 N	39 N	920 E	6 E
Caprolactam	[illegible]2	5.00E-01 I					18000 N	1800 N	680 N	1E+06 N	39000 N		
Captafol	2425061	2.00E-03 I		8.60E-03 H			7.8 C	0.73 C	0.37 C	670 C	74 C		
Captan	133062	1.30E-01 I		3.50E-03 H			19 C	1.8 C	0.9 C	1600 C	180 C		
Carbaryl	63252	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N	0.34 S	23 N
Carbofuran	1563662	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
**Carbon disulfide	75150	1.00E-01 I	2.00E-01 I			☒	1000 N	730 N	140 N	200000 N	7800 N	11 E	14 E
Carbon tetrachloride	56235	7.00E-04 I	5.71E-04 E	1.30E-01 I	5.25E-02 I	☒	0.16 C	0.12 C	0.024 C	44 C	4.9 C	0.2 E	0.03 E
Carbosulfan	55285148	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
Carboxin	5234684	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Chloral	75876	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Chloramben	133904	1.50E-02 I					550 N	55 N	20 N	31000 N	1200 N		
Chloranil	118752			4.03E-01 H			0.17 C	0.016 C	0.0078 C	14 C	1.6 C		
Chlordane	57749	6.00E-05 I		1.30E+00 I	1.29E+00 I		0.052 C	0.0049 C	0.0024 C	4.4 C	0.49 C	10 E	2 E
Chlorimuron-ethyl	90982324	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Chlorine	7782505	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Chlorine dioxide	10049044		5.71E-05 I				2.1 N	0.21 N					
Chloroacetaldehyde	107200	6.90E-03 O					250 N	25 N	9.3 N	14000 N	540 N		
Chloroacetic acid	79118	2.00E-03 H					73 N	7.3 N	2.7 N	4100 N	160 N		
2-Chloroacetophenone	532274		8.57E-06 I				0.31 N	0.031 N					
4-Chloroaniline	106478	4.00E-03 I					150 N	15 N	5.4 N	8200 N	310 N	1200 S	0.3 E
Chlorobenzene	108907	2.00E-02 I	5.71E-03 A			☒	39 N	21 N	27 N	41000 N	1600 N	94 E	0.6 E
Chlorobenzilate	510156	2.00E-02 I		2.70E-01 H	2.70E-01 H		0.25 C	0.023 C	0.012 C	21 C	2.4 C		
p-Chlorobenzoic acid	74113	2.00E-01 H					7300 N	730 N	270 N	410000 N	16000 N		
4-Chlorobenzotrifluoride	98566	2.00E-02 H					730 N	73 N	27 N	41000 N	1600 N	86 N	7.5 N
2-Chloro-1,3-butadiene	126998	2.00E-02 A	2.00E-03 H			☒	14 N	7.3 N	27 N	41000 N	1600 N		
1-Chlorobutane	109693	4.00E-01 H				☒	2400 N	1500 N	540 N	820000 N	31000 N		
Chlorodibromomethane	124481	2.00E-02 I		8.40E-02 I		☒	0.13 C	0.075 C	0.038 C	68 C	7.6 C	1900 E	0.2 E
**1-Chloro-1,1-difluoroethane	75683	I	1.43E+01			☒	87000 N	52000 N					

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Chlorodifluoromethane	75456		1.43e+01 I			☒	87000 N	52000 N					
Chloroethane	75003	4.00E-01 E	2.86E+00 I			☒	8600 N	10000 N	540 N	820000 N	31000 N	2600 S	33 N
2-Chloroethyl vinyl ether	110758	2.50E-02 O				☒	150 N	91 N	34 N	51000 N	2000 N		
Chloroform	67663	1.00E-02 I		6.10E-03 I	8.05E-02 I	☒	0.15 C	0.078 C	0.52 C	940 C	100 C	0.2 E	0.3 E
Chloromethane	74873			1.30E-02 H	6.30E-03 H	☒	1.4 C	0.99 C	0.24 C	440 C	49 C	0.063 C	0.0066 C
4-Chloro-2,2-methylaniline hydrochloride	3165933			4.60E-01 H			0.15 C	0.014 C	0.0069 C	12 C	1.4 C		
4-Chloro-2-methylaniline	95692			5.80E-01 H			0.12 C	0.011 C	0.0054 C	9.9 C	1.1 C		
beta-Chloronaphthalene	91587	8.00E-02 I					2900 N	290 N	110 N	160000 N	6300 N	2.8 S	140 N
o-Chloronitrobenzene	88733			2.50E-02 H		☒	0.42 C	0.25 C	0.13 C	230 C	26 C		
p-Chloronitrobenzene	100005			1.80E-02 H		☒	0.59 C	0.35 C	0.18 C	320 C	35 C		
2-Chlorophenol	95578	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N	53000 E	2 E
2-Chloropropane	75296		2.86E-02 H			☒	170 N	100 N				22 N	0.64 N
Chlorothalonil	1897456	1.50E-02 I		1.10E-02 H			6.1 C	0.57 C	0.29 C	520 C	58 C		
o-Chlorotoluene	95498	2.00E-02 I				☒	120 N	73 N	27 N	41000 N	1600 N	1200 N	5.6 N
Chlorpropham	101213	2.00E-01 I					7300 N	730 N	270 N	410000 N	16000 N		
Chlorpyrifos	2921882	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N		
Chlorpyrifos-methyl	5598130	1.00E-02 H					370 N	37 N	14 N	20000 N	780 N		
Chlorsulfuron	64902723	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Chlorthiophos	60238564	8.00E-04 H					29 N	2.9 N	1.1 N	1600 N	63 N		
Chromium III and compounds	16065831	1.00E+00 I	5.71E-07 W				37000 N	0.0021 N	1400 N	1E+06 N	78000 N		
Chromium VI and compounds	18540299	5.00E-03 I			4.20E+01 I		180 N	0.00015 C	6.8 N	10000 N	390 N	140 E	19 E
Coal tar	8001589				2.20E+00 W			0.0028 C					
Cobalt	7440484	6.00E-02 E					2200 N	220 N	81 N	120000 N	4700 N		
Coke Oven Emissions	8007452				2.17E+00 I			0.0029 C					
**Copper and compounds	7440508	4.00E-02 E					1500 N	150 N	54 N	82000 N	3100 N		
Crotonaldehyde	123739	1.00E-02 W		1.90E+00 H	1.90E+00 W		0.035 C	0.0033 C	0.0017 C	3 C	0.34 C		
Cumene	98828	4.00E-02 I	2.57E-03 H				1500 N	9.4 N	54 N	82000 N	3100 N	81 N	65 N
Cyanides:													
Barium cyanide	542621	1.00E-01 W					3700 N	370 N	140 N	200000 N	7800 N		
Calcium cyanide	592018	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N		
Copper cyanide	544923	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Cyanazine	21725462	2.00E-03 H		8.40E-01 H			0.08 C	0.0075 C	0.0038 C	6.8 C	0.76 C		
Cyanogen	460195	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N		
Cyanogen bromide	506683	9.00E-02 I					3300 N	330 N	120 N	180000 N	7000 N		
Cyanogen chloride	506774	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Free cyanide	57125	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Hydrogen cyanide	74908	2.00E-02 I	8.57E-04 I				730 N	3.1 N	27 N	41000 N	1600 N		
Potassium cyanide	151508	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Potassium silver cyanide	506616	2.00E-01 I					7300 N	730 N	270 N	410000 N	16000 N		

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Silver cyanide	506649	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Sodium cyanide	143339	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N		
**Thiocyanate		2.00E-02 E					730 N	73 N	27 N	41000 N	1600 N		
Zinc cyanide	557211	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Cyclohexanone	108941	5.00E+00 I				☒	30000 N	18000 N	6800 N	1E+06 N	390000 N		
Cyclohexlamine	108918	2.00E-01 I					7300 N	730 N	270 N	410000 N	16000 N		
Cyhalothrin/Karate	68085858	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Cypermethrin	52315078	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
Cyromazine	66215278	7.50E-03 I					270 N	27 N	10 N	15000 N	590 N		
Dacthal	1861321	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
Dalapon	75990	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
Danitol	39515418	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
DDD	72548			2.40E-01 I			0.28 C	0.026 C	0.013 C	24 C	2.7 C	37 S	0.7 E
DDE	72559			3.40E-01 I			0.2 C	0.018 C	0.0093 C	17 C	1.9 C	10 S	0.5 E
DDT	50293	5.00E-04 I		3.40E-01 I	3.40E-01 I		0.2 C	0.018 C	0.0093 C	17 C	1.9 C	80 E	1 E
Decabromodiphenyl ether	1163195	1.00E-02 I				☒	61 N	37 N	14 N	20000 N	780 N		
Demeton	8065483	4.00E-05 I					1.5 N	0.15 N	0.054 N	82 N	3.1 N		
Diallate	2303164			6.10E-02 H		☒	0.17 C	0.1 C	0.052 C	94 C	10 C		
Diazinon	333415	9.00E-04 H					33 N	3.3 N	1.2 N	1800 N	70 N	5400 S	2.8 N
Dibenzofuran	132649	4.00E-03 E					150 N	15 N	5.4 N	8200 N	310 N	120 S	120 N
1,4-Dibromobenzene	106376	1.00E-02 I				☒	61 N	37 N	14 N	20000 N	780 N		
1,2-Dibromo-3-chloropropane	96128		5.71E-05 I	1.40E+00 H	2.42E-03 H	☒	0.048 C	0.21 N	0.0023 C	4.1 C	0.46 C	1.9 N	0.00061 M
1,2-Dibromoethane	106934		5.71E-05 H	8.50E+01 I	7.70E-01 I	☒	0.00075 C	0.0081 C	0.00004 C	0.067 C	0.0075 C	0.0058 C	0.00018 M
Dibutyl phthalate	84742	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N	100 E	120 E
Dicamba	1918009	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
1,2-Dichlorobenzene	95501	9.00E-02 I	4.00E-02 A			☒	270 N	150 N	120 N	180000 N	7000 N	300 E	6 E
1,3-Dichlorobenzene	541731	8.90E-02 O				☒	540 N	320 N	120 N	180000 N	7000 N		
1,4-Dichlorobenzene	106467		2.29E-01 I	2.40E-02 H		☒	0.44 C	0.26 C	0.13 C	240 C	27 C	7700 E	1 E
3,3'-Dichlorobenzidine	91941			4.50E-01 I			0.15 C	0.014 C	0.007 C	13 C	1.4 C	52 S	0.01 E
1,4-Dichloro-2-butene	764410				9.30E+00 H	☒	0.0011 C	0.00067 C					
Dichlorodifluoromethane	75718	2.00E-01 I	5.71E-02 A			☒	390 N	210 N	270 N	410000 N	16000 N	37 N	7.5 N
1,1-Dichloroethane	75343	1.00E-01 H	1.43E-01 A			☒	810 N	520 N	140 N	200000 N	7800 N	980 E	11 E
1,2-Dichloroethane (EDC)	107062		2.86E-03 E	9.10E-02 I	9.10E-02 I	☒	0.12 C	0.069 C	0.035 C	63 C	7 C	0.3 E	0.01 E
1,1-Dichloroethylene	75354	9.00E-03 I		6.00E-01 I	1.75E-01 I	☒	0.044 C	0.036 C	0.0053 C	9.5 C	1.1 C	0.04 E	0.03 E
1,2-Dichloroethylene (cis)	156592	1.00E-02 H				☒	61 N	37 N	14 N	20000 N	780 N	1500 E	0.2 E
1,2-Dichloroethylene (trans)	156605	2.00E-02 I				☒	120 N	73 N	27 N	41000 N	1600 N	3600 E	0.3 E
1,2-Dichloroethylene (mixture)	540590	9.00E-03 H				☒	55 N	33 N	12 N	18000 N	700 N		
2,4-Dichlorophenol	120832	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N	4800 S	0.5 E
2,4-Dichlorophenoxyacetic Acid (2,4-D)	94757	1.00E-02 I				☒	61 N	37 N	14 N	20000 N	780 N	7000 S	1.7 M

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4-(2,4-Dichlorophenoxy)butyric Acid	94826	8.00E-03 I					290 N	29 N	11 N	16000 N	630 N		
1,2-Dichloropropane	78875		1.14E-03 I	6.80E-02 H		☒	0.16 C	0.092 C	0.046 C	84 C	9.4 C	11 E	0.02 E
2,3-Dichloropropanol	616239	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N		
1,3-Dichloropropene	542756	3.00E-04 I	5.71E-03 I	1.75E-01 H	1.30E-01 H	☒	0.077 C	0.048 C	0.018 C	33 C	3.7 C	0.1 E	0.001 E
Dichlorvos	62737	5.00e-04 I	1.43E-04 I	2.90E-01 I			0.23 C	0.022 C	0.011 C	20 C	2.2 C	3.5 C	0.00072 C
Dicofol	115322			4.40E-01 W			0.15 C	0.014 C	0.0072 C	13 C	1.5 C		
Dicyclopentadiene	77736	3.00E-02 H	5.71E-05 A			☒	0.42 N	0.21 N	41 N	61000 N	2300 N		
Dieldrin	60571	5.00E-05 I		1.60E+01 I	1.61E+01 I		0.0042 C	0.00039 C	0.0002 C	0.36 C	0.04 C	2 E	0.001 E
Diesel emissions			1.43E-03 I				52 N	5.2 N					
Diethyl phthalate	84662	8.00E-01 I					29000 N	2900 N	1100 N	1E+06 N	63000 N	520 E	110 E
Diethylene glycol, monobutyl ether	112345		5.71E-03 H				210 N	21 N					
Diethylene glycol, monoethyl ether	111900	2.00E+00 H					73000 N	7300 N	2700 N	1E+06 N	160000 N		
Diethylforamide	617845	1.10E-02 H					400 N	40 N	15 N	22000 N	860 N		
Di(2-ethylhexyl)adipate	103231	6.00E-01 I		1.20E-03 I			56 C	5.2 C	2.6 C	4800 C	530 C		
Diethylstilbestrol	56531			4.70E+03 H			0.00001 C	1E-06 C	7E-07 C	0.0012 C	0.00014 C		
Difenzoquat (Avenge)	43222486	8.00E-02 I					2900 N	290 N	110 N	160000 N	6300 N		
Diflubenzuron	35367385	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
1,1-Difluoroethane	75376		1.14E+01 I			☒	69000 N	42000 N					
Diisopropyl methylphosphonate (DIMP)	1445756	8.00E-02 I					2900 N	290 N	110 N	160000 N	6300 N		
Dimethipin	55290647	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Dimethoate	60515	2.00E-04 I					7.3 N	0.73 N	0.27 N	410 N	16 N		
3,3'-Dimethoxybenzidine	119904			1.40E-02 H			4.8 C	0.45 C	0.23 C	410 C	46 C		
Dimethylamine	124403		5.71E-06 W				0.21 N	0.021 N					
2,4-Dimethylaniline hydrochloride	21436964			5.80E-01 H			0.12 C	0.011 C	0.0054 C	9.9 C	1.1 C		
2,4-Dimethylaniline	95681			7.50E-01 H			0.09 C	0.0083 C	0.0042 C	7.6 C	0.85 C		
N-N-Dimethylaniline	121697	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
3,3'-Dimethylbenzidine	119937			9.20E+00 H			0.0073 C	0.00068 C	0.00034 C	0.62 C	0.069 C	29 C	0.00039 C
N,N-Dimethylformamide	68122	1.00E-01 H	8.57E-03 I				3700 N	31 N	140 N	200000 N	7800 N		
1,1-Dimethylhydrazine	57147			2.60E+00 W	3.50E+00 W		0.026 C	0.0018 C	0.0012 C	2.2 C	0.25 C		
1,2-Dimethylhydrazine	540738			3.70E+01 W	3.70E+01 W		0.0018 C	0.00017 C	0.00009 C	0.15 C	0.017 C		
2,4-Dimethylphenol	105679	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N	5400 E	3 E
2,6-Dimethylphenol	576261	6.00E-04 I					22 N	2.2 N	0.81 N	1200 N	47 N		
3,4-Dimethylphenol	95658	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Dimethyl phthalate	131113	1.00E+01 H					370000 N	37000 N	14000 N	1E+06 N	780000 N	1600 E	1200 E
Dimethyl terephthalate	120616	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
1,2-Dinitrobenzene	528290	4.00E-04 H					15 N	1.5 N	0.54 N	820 N	31 N		
1,3-Dinitrobenzene	99650	1.00E-04 I					3.7 N	0.37 N	0.14 N	200 N	7.8 N		
1,4-Dinitrobenzene	100254	4.00E-04 H					15 N	1.5 N	0.54 N	820 N	31 N		
4,6-Dinitro-o-cyclohexyl phenol	131895	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		

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2,4-Dinitrophenol	51285	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N	360 N	0.1 E
Dinitrotoluene mixture				6.80E-01 I			0.099 C	0.0092 C	0.0046 C	8.4 C	0.94 C		
2,4-Dinitrotoluene	121142	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N	120 S	0.2 E
2,6-Dinitrotoluene	606202	1.00E-03 H					37 N	3.7 N	1.4 N	2000 N	78 N	370 S	0.1 E
Dinoseb	88857	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
di-n-Octyl phthalate	117840	2.00E-02 H					730 N	73 N	27 N	41000 N	1600 N	1000000 S	1000000 E
1,4-Dioxane	123911			1.10E-02 I			6.1 C	0.57 C	0.29 C	520 C	58 C		
Diphenamid	957517	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
Diphenylamine	122394	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
1,2-Diphenylhydrazine	122667			8.00E-01 I	7.70E-01 I		0.084 C	0.0081 C	0.0039 C	7.2 C	0.8 C		
Diquat	85007	2.20E-03 I					80 N	8 N	3 N	4500 N	170 N		
Direct black 38	1937377			8.60E+00 H			0.0078 C	0.00073 C	0.00037 C	0.67 C	0.074 C		
Direct blue 6	2602462			8.10E+00 H			0.0083 C	0.00077 C	0.00039 C	0.71 C	0.079 C		
Direct brown 95	16071866			9.30E+00 H			0.0072 C	0.00067 C	0.00034 C	0.62 C	0.069 C		
Disulfoton	298044	4.00E-05 I					1.5 N	0.15 N	0.054 N	82 N	3.1 N		
1,4-Dithiane	505293	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
Diuron	330541	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Dodine	2439103	4.00E-03 I					150 N	15 N	5.4 N	8200 N	310 N		
Endosulfan	115297	6.00E-03 I					220 N	22 N	8.1 N	12000 N	470 N	1 S	3 E
Endothall	145733	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Endrin	72208	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N	16 S	0.4 E
Epichlorohydrin	106898	2.00E-03 H	2.86E-04 I	9.90E-03 I	4.20E-03 I		6.8 C	1 N	0.32 C	580 C	65 C		
1,2-Epoxybutane	106887		5.71E-03 I				210 N	21 N					
Ethephon (2-chloroethyl phosphonic acid)	16672870	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Ethion	563122	5.00E-04 I					18 N	1.8 N	0.68 N	1000 N	39 N		
2-Ethoxyethanol acetate	111159	3.00E-01 A					11000 N	1100 N	410 N	610000 N	23000 N		
2-Ethoxyethanol	110805	4.00E-01 H	5.71E-02 I				15000 N	210 N	540 N	820000 N	31000 N		
Ethyl acrylate	140885			4.80E-02 H			1.4 C	0.13 C	0.066 C	120 C	13 C		
EPTC (S-Ethyl dipropylthiocarbamate)	759944	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Ethyl acetate	141786	9.00E-01 I					33000 N	3300 N	1200 N	1E+06 N	70000 N		
Ethylbenzene	100414	1.00E-01 I	2.86E-01 I			X	1300 N	1000 N	140 N	200000 N	7800 N	260 E	5 E
Ethylene cyanohydrin	109784	3.00E-01 H					11000 N	1100 N	410 N	610000 N	23000 N		
Ethylene diamine	107153	2.00E-02 H					730 N	73 N	27 N	41000 N	1600 N		
Ethylene glycol	107211	2.00E+00 I					73000 N	7300 N	2700 N	1E+06 N	160000 N		
Ethylene glycol, monobutyl ether	111762		5.71E-03 H				210 N	21 N					
Ethylene oxide	75218			1.02E+00 H	3.50E-01 H		0.066 C	0.018 C	0.0031 C	5.6 C	0.63 C		
Ethylene thiourea (ETU)	96457	8.00E-05 I		1.19E-01 H			0.57 C	0.053 C	0.027 C	48 C	5.4 C		
Ethyl ether	60297	2.00E-01 I				X	1200 N	730 N	270 N	410000 N	16000 N		
Ethyl methacrylate	97632	9.00E-02 H					3300 N	330 N	120 N	180000 N	7000 N		

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Ethyl p-nitrophenyl phenylphosphorothioate	2104645	1.00E-05 I					0.37 N	0.037 N	0.014 N	20 N	0.78 N		
Ethylnitrosourea	759739			1.40E+02 W			0.00048 C	0.00005 C	0.00002 C	0.041 C	0.0046 C		
Ethylphthalyl ethyl glycolate	84720	3.00E+00 I					110000 N	11000 N	4100 N	1E+06 N	230000 N		
Express	10120	8.00E-03 I					290 N	29 N	11 N	16000 N	630 N		
Fenamiphos	22224926	2.50E-04 I					9.1 N	0.91 N	0.34 N	510 N	20 N		
Fluometuron	2164172	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Fluoride	7782414	6.00E-02 I					2200 N	220 N	81 N	120000 N	4700 N		
Fluoridone	59756604	8.00E-02 I					2900 N	290 N	110 N	160000 N	6300 N		
Flurprimidol	56425913	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Flutolanil	66332965	6.00E-02 I					2200 N	220 N	81 N	120000 N	4700 N		
Fluvalinate	69409945	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
Folpet	133073	1.00E-01 I		3.50E-03 I			19 C	1.8 C	0.9 C	1600 C	180 C		
Fomesafen	72178020			1.90E-01 I			0.35 C	0.033 C	0.017 C	30 C	3.4 C		
Fonofos	944229	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Formaldehyde	50000	2.00E-01 I			4.55E-02 I		7300 N	0.14 C	270 N	410000 N	16000 N		
Formic Acid	64186	2.00E+00 H					73000 N	7300 N	2700 N	1E+06 N	160000 N		
Fosetyl-al	39148248	3.00E+00 I					110000 N	11000 N	4100 N	1E+06 N	230000 N		
Furan	110009	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Furazolidone	67458			3.80E+00 H			0.018 C	0.0016 C	0.00083 C	1.5 C	0.17 C		
Furfural	98011	3.00E-03 I	1.43E-02 A				110 N	52 N	4.1 N	6100 N	230 N		
Furium	531828			5.00E+01 H			0.0013 C	0.00013 C	0.00006 C	0.11 C	0.013 C		
Furmecyclox	60568050			3.00E-02 I			2.2 C	0.21 C	0.11 C	190 C	21 C		
Glufosinate-ammonium	77182822	4.00E-04 I					15 N	1.5 N	0.54 N	820 N	31 N		
Glycidaldehyde	765344	4.00E-04 I	2.86E-04 H				15 N	1 N	0.54 N	820 N	31 N		
Glyphosate	1071836	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Haloxyfop-methyl	69806402	5.00E-05 I					1.8 N	0.18 N	0.068 N	100 N	3.9 N		
Harmony	79277273	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
HCH (alpha)	319846			6.30E+00 I	6.30E+00 I		0.011 C	0.00099 C	0.0005 C	0.91 C	0.1 C	0.9 E	0.0004 E
HCH (beta)	319857			1.80E+00 I	1.80E+00 I		0.037 C	0.0035 C	0.0018 C	3.2 C	0.35 C	16 E	0.002 E
HCH (gamma) Lindane	58899	3.00E-04 I		1.30E+00 H			0.052 C	0.0048 C	0.0024 C	4.4 C	0.49 C	4.2 C	0.006 E
HCH-technical	608731			1.80E+00 I	1.79E+00 I		0.037 C	0.0035 C	0.0018 C	3.2 C	0.35 C		
Heptachlor	76448	5.00E-04 I		4.50E+00 I	4.55E+00 I	☒	0.0023 C	0.0014 C	0.0007 C	1.3 C	0.14 C	0.3 E	0.06 E
Heptachlor epoxide	1024573	1.30E-05 I		9.10E+00 I	9.10E+00 I	☒	0.0012 C	0.00069 C	0.00035 C	0.63 C	0.07 C	1 E	0.03 E
Hexabromobenzene	87821	2.00E-03 I				☒	12 N	7.3 N	2.7 N	4100 N	160 N		
Hexachlorobenzene	118741	8.00E-04 I		1.60E+00 I	1.61E+00 I	☒	0.0066 C	0.0039 C	0.002 C	3.6 C	0.4 C	1 E	0.8 E
Hexachlorobutadiene	87683	2.00E-04 H		7.80E-02 I	7.70E-02 I	☒	0.14 C	0.081 C	0.04 C	73 C	8.2 C	1 E	0.1 E
Hexachlorocyclopentadiene	77474	7.00E-03 I	2.00E-05 H			☒	0.15 N	0.073 N	9.5 N	14000 N	550 N	2 E	10 E
Hexachlorodibenzo-p-dioxin mixture	19408743			6.20E+03 I	4.55E+03 I		0.00001 C	1E-06 C	5E-07 C	0.0009 C	0.0001 C		
Hexachloroethane	67721	1.00E-03 I		1.40E-02 I	1.40E-02 I	☒	0.75 C	0.45 C	0.23 C	410 C	46 C	49 E	0.2 E

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Hexachlorophene	70304	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N		
Hexahydro-1,3,5-trinitro-1,3,5-triazine	121824	3.00E-03 I		1.10E-01 I			0.61 C	0.057 C	0.029 C	52 C	5.8 C		
1,6-Hexamethylene diisocyanate	822060		2.86E-06 I				0.1 N	0.01 N					
n-Hexane	110543	6.00E-02 H	5.71E-02 I			☒	350 N	210 N	81 N	120000 N	4700 N	32 N	13 N
Hexazinone	51235042	3.30E-02 I					1200 N	120 N	45 N	67000 N	2600 N		
Hydrazine, hydrazine sulfate	302012			3.00E+00 I	1.71E+01 I		0.022 C	0.00037 C	0.0011 C	1.9 C	0.21 C		
**Hydrogen chloride	7647010		5.71E-03 I				210 N	21 N					
**Hydrogen sulfide	7783064	3.00E-03 I	2.85E-04 I				110 N	1 N	4.1 N	6100 N	230 N		
Hydroquinone	123319	4.00E-02 H					1500 N	150 N	54 N	82000 N	3100 N		
Imazalil	35554440	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Imazaquin	81335377	2.50E-01 I					9100 N	910 N	340 N	510000 N	20000 N		
Iprodione	36734197	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N		
**Iron	7439896	3.00E-01 E					11000 N	1100 N	410 N	610000 N	23000 N		
Isobutanol	78831	3.00E-01 I				☒	1800 N	1100 N	410 N	610000 N	23000 N		
Isophorone	78591	2.00E-01 I		9.50E-04 I			71 C	6.6 C	3.3 C	6000 C	670 C	3400 E	0.2 E
Isopropalin	33820530	1.50E-02 I					550 N	55 N	20 N	31000 N	1200 N		
Isopropyl methyl phosphonic acid	1832548	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Isoxaben	82558507	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Kepone	143500			1.80E+01 E			0.0037 C	0.00035 C	0.00018 C	0.32 C	0.035 C		
Lactofen	77501634	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Linuron	330552	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Lithium	7439932	2.00E-02 E					730 N	73 N	27 N	41000 N	1600 N		
Londax	83056996	2.00E-01 I					7300 N	730 N	270 N	410000 N	16000 N		
Malathion	121755	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Maleic anhydride	108316	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Maleic hydrazide	123331	5.00E-01 I					18000 N	1800 N	680 N	1E+06 N	39000 N		
Malononitrile	109773	2.00E-05 H					0.73 N	0.073 N	0.027 N	41 N	1.6 N		
Mancozeb	8018017	3.00E-02 H					1100 N	110 N	41 N	61000 N	2300 N		
Maneb	12427382	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Manganese and compounds	7439965	5.00E-03 I	1.43e-05 I				180 N	0.052 N	6.8 N	10000 N	390 N		
Mephosfolan	950107	9.00E-05 H					3.3 N	0.33 N	0.12 N	180 N	7 N		
Mepiquat chloride	24307264	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
**Mercuric chloride	7487947	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N		
Mercury (inorganic)	7439976	3.00E-04 H	8.57E-05 H				11 N	0.31 N	0.41 N	610 N	23 N	7 E	3 E
Mercury (methyl)	22967926	1.00E-04 I					3.7 N	0.37 N	0.14 N	200 N	7.8 N		
Merphos	150505	3.00E-05 I					1.1 N	0.11 N	0.041 N	61 N	2.3 N		
Merphos oxide	78488	3.00E-05 I					1.1 N	0.11 N	0.041 N	61 N	2.3 N		
Metalaxyl	57837191	6.00E-02 I					2200 N	220 N	81 N	120000 N	4700 N		
Methacrylonitrile	126987	1.00E-04 I	2.00E-04 A				3.7 N	0.73 N	0.14 N	200 N	7.8 N		

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Methamidophos	10265926	5.00E-05 I					1.8 N	0.18 N	0.068 N	100 N	3.9 N		
Methanol	67561	5.00E-01 I					18000 N	1800 N	680 N	1E+06 N	39000 N		
Methidathion	950378	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Methomyl	16752775	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Methoxychlor	72435	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N	41 S	62 E
2-Methoxyethanol acetate	110496	2.00E-03 A					73 N	7.3 N	2.7 N	4100 N	160 N		
2-Methoxyethanol	109864	1.00E-03 H	5.71E-03 I				37 N	21 N	1.4 N	2000 N	78 N		
2-Methoxy-5-nitroaniline	99592			4.60E-02 H			1.5 C	0.14 C	0.069 C	120 C	14 C		
Methyl acetate	79209	1.00E+00 H					37000 N	3700 N	1400 N	1E+06 N	78000 N		
Methyl acrylate	96333	3.00E-02 A					1100 N	110 N	41 N	61000 N	2300 N		
2-Methylaniline hydrochloride	636215			1.80E-01 H			0.37 C	0.035 C	0.018 C	32 C	3.5 C		
2-Methylaniline	95534			2.40E-01 H			0.28 C	0.026 C	0.013 C	24 C	2.7 C		
Methyl chlorocarbonate	79221	1.00E+00 W					37000 N	3700 N	1400 N	1E+06 N	78000 N		
4-(2-Methyl-4-chlorophenoxy) butyric acid	94815	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
2-Methyl-4-chlorophenoxyacetic acid	94746	5.00E-04 I					18 N	1.8 N	0.68 N	1000 N	39 N		
2-(2-Methyl-14-chlorophenoxy)propionic acid	93652	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Methylcyclohexane	108872		8.57E-01 H				31000 N	3100 N				60 S	1500 N
Methylene bromide	74953	1.00E-02 A				☒	61 N	37 N	14 N	20000 N	780 N		
Methylene chloride	75092	6.00E-02 I	8.57E-01 H	7.50E-03 I	1.64E-03 I	☒	4.1 C	3.8 C	0.42 C	760 C	85 C	7 E	0.01 E
4,4'-Methylene bis(2-chloroaniline)	101144	7.00E-04 H		1.30E-01 H	1.30E-01 H		0.52 C	0.048 C	0.024 C	44 C	4.9 C		
4,4'-Methylenebisbenzeneamine	101779			2.50E-01 W			0.27 C	0.025 C	0.013 C	23 C	2.6 C		
4,4'-Methylene bis(N,N'-dimethyl)aniline	101611			4.60E-02 I			1.5 C	0.14 C	0.069 C	120 C	14 C		
4,4'-Methylenediphenyl isocyanate	101688		5.71E-06 I			☒	0.035 N	0.021 N					
Methyl ethyl ketone	78933	6.00E-01 I	2.86E-01 I			☒	1900 N	1000 N	810 N	1E+06 N	47000 N		
Methyl hydrazine	60344			1.10E+00 W			0.061 C	0.0057 C	0.0029 C	5.2 C	0.58 C		
Methyl isobutyl ketone	108101	8.00E-02 H	2.29E-02 A				2900 N	84 N	110 N	160000 N	6300 N		
Methyl methacrylate	80626	8.00E-02 H					2900 N	290 N	110 N	160000 N	6300 N		
2-Methyl-5-nitroaniline	99558			3.30E-02 H			2 C	0.19 C	0.096 C	170 C	19 C		
Methyl parathion	298000	2.50E-04 I					9.1 N	0.91 N	0.34 N	510 N	20 N	28 S	0.041 N
2-Methylphenol (o-cresol)	95487	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N	12000 S	6 E
3-Methylphenol (m-cresol)	103394	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
4-Methylphenol (p-cresol)	106445	5.00E-03 H					180 N	18 N	6.8 N	10000 N	390 N		
Methyl styrene (mixture)	25013154	6.00E-03 A	1.14E-02 A			☒	60 N	42 N	8.1 N	12000 N	470 N	100 N	1 N
Methyl styrene (alpha)	98839	7.00E-02 A				☒	430 N	260 N	95 N	140000 N	5500 N	8.8 S	7.5 N
Methyl tertbutyl ether (MTBE)	1634044	5.00E-03 E	8.57E-01 I			☒	180 N	3100 N	6.8 N	10000 N	390 N		
Metolaclor (Dual)	51218452	1.50E-01 H					5500 N	550 N	200 N	310000 N	12000 N		
Metribuzin	21087649	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Mirex	2385855	2.00E-04 I		1.80E+00 W			0.037 C	0.0035 C	0.0018 C	3.2 C	0.35 C		
Molinate	2212671	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		

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Molybdenum	7439987	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Monochloramine	10599903	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Naled	300765	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
2-Naphthylamine	91598			1.30e+02 E			0.00052 C	0.00005 C	0.00002 C	0.044 C	0.0049 C		
Napropamide	15299997	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
Nickel refinery dust					8.40E-01 I			0.0075 C					
Nickel and compounds	7440020	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N	6900 E	21 E
Nickel subsulfide	12035722				1.70E+00 I			0.0037 C					
Nitrapyrin	1929824	1.50E-03 W					55 N	5.5 N	2 N	3100 N	120 N		
Nitrate	14797558	1.60E+00 I					58000 N	5800 N	2200 N	1E+06 N	130000 N		
Nitric Oxide	10102439	1.00E-01 W					3700 N	370 N	140 N	200000 N	7800 N		
Nitrite	14797650	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
2-Nitroaniline	88744	6.00E-05 W	5.71E-05 H				2.2 N	0.21 N	0.081 N	120 N	4.7 N		
3-Nitroaniline	99092	3.00E-03 O					110 N	11 N	4.1 N	6100 N	230 N		
4-Nitroaniline	100016	3.00E-03 O					110 N	11 N	4.1 N	6100 N	230 N		
Nitrobenzene	98953	5.00E-04 I	5.71E-04 A			☒	3.4 N	2.1 N	0.68 N	1000 N	39 N	110 E	0.09 E
Nitrofurantoin	67209	7.00E-02 H					2600 N	260 N	95 N	140000 N	5500 N		
Nitrofurazone	59870			1.50E+00 H	9.40E+00 H		0.045 C	0.00067 C	0.0021 C	3.8 C	0.43 C		
Nitrogen dioxide	10102440	1.00E+00 W					37000 N	3700 N	1400 N	1E+06 N	78000 N		
Nitroguanidine	556887	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N		
4-Nitrophenol	100027	6.20E-02 O					2300 N	230 N	84 N	130000 N	4800 N		
2-Nitropropane	79469		5.71E-03 I		9.40E+00 N		210 N	0.00067 C					
N-Nitrosodi-n-butylamine	924163			5.40E+00 I	5.60E+00 I		0.012 C	0.0011 C	0.00058 C	1.1 C	0.12 C		
N-Nitrosodiethanolamine	1116547			2.80E+00 I			0.024 C	0.0022 C	0.0011 C	2 C	0.23 C		
N-Nitrosodiethylamine	55185			1.50E+02 I	1.51E+02 I		0.00045 C	0.00004 C	0.00002 C	0.038 C	0.0043 C		
N-Nitrosodimethylamine	62759			5.10E+01 I	4.90E+01 I		0.0013 C	0.00013 C	0.00006 C	0.11 C	0.013 C		
N-Nitrosodiphenylamine	86306			4.90E-03 I			14 C	1.3 C	0.64 C	1200 C	110 C	29 C	0.2 E
N-Nitroso di-n-propylamine	621647			7.00E+00 I			0.0096 C	0.00089 C	0.00045 C	0.82 C	0.091 C	0.014 C	0.00002 E
N-Nitroso-N-methylethylamine	10595956			2.20E+01 I			0.0031 C	0.00028 C	0.00014 C	0.26 C	0.029 C		
N-Nitrosopyrrolidine	930552			2.10E+00 I	2.13E+00 I		0.032 C	0.0029 C	0.0015 C	2.7 C	0.3 C		
m-Nitrotoluene	99081	1.00E-02 H				☒	61 N	37 N	14 N	20000 N	780 N	460 S	0.42 N
o-Nitrotoluene	88722	1.00E-02 H				☒	61 N	37 N	14 N	20000 N	780 N	460 S	0.42 N
p-Nitrotoluene	99990	1.00E-02 H				☒	61 N	37 N	14 N	20000 N	780 N	460 S	0.42 N
Norflurazon	27314132	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N		
NuStar	85509199	7.00E-04 I					26 N	2.6 N	0.95 N	1400 N	55 N		
Octabromodiphenyl ether	32536520	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N		
Octahydro-1357-tetranitro-1357-tetrazocine	2691410	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Octamethylpyrophosphoramide	152169	2.00E-03 H					73 N	7.3 N	2.7 N	4100 N	160 N		
Oryzalin	19044883	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		

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Oxadiazon	19666309	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Oxamyl	23135220	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Oxyfluorfen	42874033	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N		
Paclobutrazol	76738620	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Paraquat	1910425	4.50E-03 I					160 N	16 N	6.1 N	9200 N	350 N		
Parathion	56382	6.00E-03 H					220 N	22 N	8.1 N	12000 N	470 N	110 S	3.9 N
Pebulate	1114712	5.00E-02 H					1800 N	180 N	68 N	100000 N	3900 N		
Pendimethalin	40487421	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N		
Pentabromo-6-chloro cyclohexane	87843			2.30E-02 H			2.9 C	0.27 C	0.14 C	250 C	28 C		
Pentabromodiphenyl ether	32534819	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Pentachlorobenzene	608935	8.00E-04 I				☒	4.9 N	2.9 N	1.1 N	1600 N	63 N	570 N	48 N
Pentachloronitrobenzene	82688	3.00E-03 I		2.60E-01 H		☒	0.041 C	0.024 C	0.012 C	22 C	2.5 C		
Pentachlorophenol	87865	3.00E-02 I		1.20E-01 I			0.56 C	0.052 C	0.026 C	48 C	5.3 C	7.9 C	0.2 E
Permethrin	52645531	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		
Phenmedipham	13684634	2.50E-01 I					9100 N	910 N	340 N	510000 N	20000 N		
Phenol	108952	6.00E-01 I					22000 N	2200 N	810 N	1E+06 N	47000 N	21000 S	49 E
m-Phenylenediamine	108452	6.00E-03 I					220 N	22 N	8.1 N	12000 N	470 N		
p-Phenylenediamine	106503	1.90E-01 H					6900 N	690 N	260 N	390000 N	15000 N		
Phenylmercuric acetate	62384	8.00E-05 I					2.9 N	0.29 N	0.11 N	160 N	6.3 N		
2-Phenylphenol	90437			1.94E-03 H			35 C	3.2 C	1.6 C	3000 C	330 C		
Phorate	298022	2.00E-04 H					7.3 N	0.73 N	0.27 N	410 N	16 N		
Phosmet	732116	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
**Phosphine	7803512	3.00E-04 I	8.57E-05 H				11 N	0.31 N	0.41 N	610 N	23 N		
**Phosphoric acid	7664382	I	2.86E-03				100 N	10 N					
Phosphorus (white)	7723140	2.00E-05 I					0.73 N	0.073 N	0.027 N	41 N	1.6 N		
p-Phthalic acid	100210	1.00E+00 H					37000 N	3700 N	1400 N	1E+06 N	78000 N		
Phthalic anhydride	85449	2.00E+00 I	3.43E-02 H				73000 N	130 N	2700 N	1E+06 N	160000 N		
Picloram	1918021	7.00E-02 I					2600 N	260 N	95 N	140000 N	5500 N		
Pirimiphos-methyl	29232937	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
Polybrominated biphenyls		7.00E-06 H		8.90E+00 H			0.0076 C	0.0007 C	0.00035 C	0.64 C	0.072 C		
Polychlorinated biphenyls (PCBs)	1336363			7.70E+00 I			0.0087 C	0.00081 C	0.00041 C	0.74 C	0.083 C		
Aroclor 1016	12674112	7.00E-05 I					2.6 N	0.26 N	0.095 N	140 N	5.5 N		
Aroclor 1254	11097691	2.00E-05 I					0.73 N	0.073 N	0.027 N	41 N	1.6 N		
Polychlorinated terphenyls (PCTs)				4.50E+00 E			0.015 C	0.0014 C	0.0007 C	1.3 C	0.14 C		
Polynuclear aromatic hydrocarbons												110000 S	
Acenaphthene	83329	6.00E-02 I					2200 N	220 N	81 N	120000 N	4700 N	120 S	200 E
Anthracene	120127	3.00E-01 I					11000 N	1100 N	410 N	610000 N	23000 N	6.8 S	4300 E
Benz[a]anthracene	56553			7.30E-01 E	6.10E-01 E		0.092 C	0.01 C	0.0043 C	7.8 C	0.88 C	27 S	0.7 E
Benzo[b]fluoranthene	205992			7.30E-01 E	6.10E-01 E		0.092 C	0.01 C	0.0043 C	7.8 C	0.88 C	23 S	4 E

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Benzo[k]fluoranthene	207089			7.30E-02 E	6.10E-02 E		0.92 C	0.1 C	0.043 C	78 C	8.8 C		4 E
Benzo[a]pyrene	50328			7.30E+00 I	6.10E+00 W		0.0092 C	0.001 C	0.00043 C	0.78 C	0.088 C	11 S	4 E
Carbazole	86748			2.00E-02 H			3.4 C	0.31 C	0.16 C	290 C	32 C	11 S	0.5 E
Chrysene	218019			7.30E-03 E	6.10E-03 E		9.2 C	1 C	0.43 C	780 C	88 C	3.6 S	1 E
Dibenz[ah]anthracene	53703			7.30E+00 E	6.10E+00 E		0.0092 C	0.001 C	0.00043 C	0.78 C	0.088 C	7.2 S	11 E
Fluoranthene	206440	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N	68 S	980 E
Fluorene	86737	4.00E-02 I					1500 N	150 N	54 N	82000 N	3100 N	89 S	160 E
Indeno[1,2,3-cd]pyrene	193395			7.30E-01 E	6.10E-01 E		0.092 C	0.01 C	0.0043 C	7.8 C	0.88 C	280 S	35 E
Naphthalene	91203	4.00E-02 W					1500 N	150 N	54 N	82000 N	3100 N	180 S	30 E
Pyrene	129000	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N	56 S	1400 E
Prochloraz	67747095	9.00E-03 I		1.50E-01 I			0.45 C	0.042 C	0.021 C	38 C	4.3 C		
Profluralin	26399360	6.00E-03 H					220 N	22 N	8.1 N	12000 N	470 N		
Prometon	1610180	1.50E-02 I					550 N	55 N	20 N	31000 N	1200 N		
Prometryn	7287196	4.00E-03 I					150 N	15 N	5.4 N	8200 N	310 N		
Pronamide	23950585	7.50E-02 I					2700 N	270 N	100 N	150000 N	5900 N		
Propachlor	1918167	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Propanil	709988	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Propargite	2312358	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Propargyl alcohol	107197	2.00E-03 I					73 N	7.3 N	2.7 N	4100 N	160 N		
Propazine	139402	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Propham	122429	2.00E-02 I					730 N	73 N	27 N	41000 N	1600 N		
Propiconazole	60207901	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Propylene glycol	57556	2.00E+01 H					730000 N	73000 N	27000 N	1E+06 N	1000000 N		
Propylene glycol, monoethyl ether	52125538	7.00E-01 H					26000 N	2600 N	950 N	1E+06 N	55000 N		
Propylene glycol, monomethyl ether	107982	7.00E-01 H	5.71E-01 I				26000 N	2100 N	950 N	1E+06 N	55000 N		
Propylene oxide	75569		8.57E-03 I	2.40E-01 I	1.29E-02 I		0.28 C	0.49 C	0.013 C	24 C	2.7 C		
Pursuit	81335775	2.50E-01 I					9100 N	910 N	340 N	510000 N	20000 N		
Pydrin	51630581	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Pyridine	110861	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Quinalphos	13593038	5.00E-04 I					18 N	1.8 N	0.68 N	1000 N	39 N		
Quinoline	91225			1.20E+01 H			0.0056 C	0.00052 C	0.00026 C	0.48 C	0.053 C		
Resmethrin	10463868	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
Ronnel	299843	5.00E-02 H					1800 N	180 N	68 N	100000 N	3900 N		
Rotenone	83794	4.00E-03 I					150 N	15 N	5.4 N	8200 N	310 N		
Savey	78587050	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Selenious Acid	7783008	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Selenium	7782492	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		3 E
Selenourea	630104	5.00E-03 H					180 N	18 N	6.8 N	10000 N	390 N		
Sethoxydim	74051802	9.00E-02 I					3300 N	330 N	120 N	180000 N	7000 N		

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Silver and compounds	7440224	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		
Simazine	122349	5.00E-03 I		1.20E-01 H			0.56 C	0.052 C	0.026 C	48 C	5.3 C		
Sodium azide	26628228	4.00E-03 I					150 N	15 N	5.4 N	8200 N	310 N		
Sodium diethyldithiocarbamate	148185	3.00E-02 I		2.70E-01 H			0.25 C	0.023 C	0.012 C	21 C	2.4 C		
Sodium fluoroacetate	62748	2.00E-05 I					0.73 N	0.073 N	0.027 N	41 N	1.6 N		
Sodium metavanadate	13718268	1.00E-03 H					37 N	3.7 N	1.4 N	2000 N	78 N		
Strontium, stable	7440246	6.00E-01 I					22000 N	2200 N	810 N	1E+06 N	47000 N		
Strychnine	57249	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N		
Styrene	100425	2.00E-01 I	2.86E-01 I			☒	1600 N	1000 N	270 N	410000 N	16000 N	1400 E	2 E
Systhane	88671890	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
2,3,7,8-TCDD (dioxin)	1746016			1.56E+05 H	1.16E+05 H		4E-07 C	5E-08 C	C	4E-05 C	4E-06 C		
Tebuthiuron	34014181	7.00E-02 I					2600 N	260 N	95 N	140000 N	5500 N		
Temephos	3383968	2.00E-02 H					730 N	73 N	27 N	41000 N	1600 N		
Terbacil	5902512	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Terbufos	13071799	2.50E-05 H					0.91 N	0.091 N	0.034 N	51 N	2 N		
Terbutryn	886500	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
1,2,4,5-Tetrachlorobenzene	95943	3.00E-04 I				☒	1.8 N	1.1 N	0.41 N	610 N	23 N	91 N	0.69 N
1,1,1,2-Tetrachloroethane	630206	3.00E-02 I		2.60E-02 I	2.59E-02 I	☒	0.41 C	0.24 C	0.12 C	220 C	25 C		
1,1,2,2-Tetrachloroethane	79345			2.00E-01 I	2.03E-01 I	☒	0.052 C	0.031 C	0.016 C	29 C	3.2 C	0.4 E	0.001 E
Tetrachloroethylene (PCE)	127184	1.00E-02 I		5.20E-02 E	2.03E-03 E	☒	1.1 C	3.1 C	0.061 C	110 C	12 C	11 E	0.04 E
2,3,4,6-Tetrachlorophenol	58902	3.00E-02 I					1100 N	110 N	41 N	61000 N	2300 N		
p,a,a,a-Tetrachlorotoluene	5216251			2.00E+01 H		☒	0.00053 C	0.00031 C	0.00016 C	0.29 C	0.032 C		
Tetrachlorovinphos	961115	3.00E-02 I		2.40E-02 H			2.8 C	0.26 C	0.13 C	240 C	27 C		
Tetraethyldithiopyrophosphate	3689245	5.00E-04 I					18 N	1.8 N	0.68 N	1000 N	39 N		
Tetraethyl lead	78002	1.00E-07 I					0.0037 N	0.00037 N	0.00014 N	0.2 N	0.0078 N	0.00068 N	0.000034 N
**1,1,1,2-Tetrafluoroethane	811972	I	2.29E+01			☒	140000 N	84000 N					
Thallic oxide	1314325	7.00E-05 W					2.6 N	0.26 N	0.095 N	140 N	5.5 N		
Thallium													0.4 E
Thallium acetate	563688	9.00E-05 I					3.3 N	0.33 N	0.12 N	180 N	7 N		
Thallium carbonate	6533739	8.00E-05 I					2.9 N	0.29 N	0.11 N	160 N	6.3 N		
Thallium chloride	7791120	8.00E-05 I					2.9 N	0.29 N	0.11 N	160 N	6.3 N		
Thallium nitrate	10102451	9.00E-05 I					3.3 N	0.33 N	0.12 N	180 N	7 N		
Thallium selenite	12039520	9.00E-05 W					3.3 N	0.33 N	0.12 N	180 N	7 N		
Thallium sulfate	7446186	8.00E-05 I					2.9 N	0.29 N	0.11 N	160 N	6.3 N		
Thiobencarb	28249776	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
2-(Thiocyanomethylthio)-benzothiazole	21564170	3.00E-02 H					1100 N	110 N	41 N	61000 N	2300 N		
Thiofanox	39196184	3.00E-04 H					11 N	1.1 N	0.41 N	610 N	23 N		
Thiophanate-methyl	23564058	8.00E-02 I					2900 N	290 N	110 N	160000 N	6300 N		
Thiram	137268	5.00E-03 I					180 N	18 N	6.8 N	10000 N	390 N		

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Tin and compounds		6.00E-01 H					22000 N	2200 N	810 N	1E+06 N	47000 N		
Toluene	108883	2.00E-01 I	1.14E-01 I			☒	750 N	420 N	270 N	410000 N	16000 N	520 E	5 E
Toluene-2,4-diamine	95807			3.20E+00 H			0.021 C	0.002 C	0.00099 C	1.8 C	0.2 C		
Toluene-2,5-diamine	95705	6.00E-01 H					22000 N	2200 N	810 N	1E+06 N	47000 N		
Toluene-2,6-diamine	823405	2.00E-01 H					7300 N	730 N	270 N	410000 N	16000 N		
p-Toluidine	106490			1.90E-01 H			0.35 C	0.033 C	0.017 C	30 C	3.4 C		
Toxaphene	8001352			1.10E+00 I	1.12E+00 I		0.061 C	0.0056 C	0.0029 C	5.2 C	0.58 C	5 E	0.04 E
Tralomethrin	66841256	7.50E-03 I					270 N	27 N	10 N	15000 N	590 N		
Triallate	2303175	1.30E-02 I					470 N	47 N	18 N	27000 N	1000 N		
Triasulfuron	82097505	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
1,2,4-Tribromobenzene	615543	5.00E-03 I				☒	30 N	18 N	6.8 N	10000 N	390 N		
Tributyltin oxide (TBTO)	56359	3.00E-05 I					1.1 N	0.11 N	0.041 N	61 N	2.3 N		
2,4,6-Trichloroaniline hydrochloride	33663502			2.90E-02 H			2.3 C	0.22 C	0.11 C	200 C	22 C		
2,4,6-Trichloroaniline	634935			3.40E-02 H			2 C	0.18 C	0.093 C	170 C	19 C		
1,2,4-Trichlorobenzene	120821	1.00E-02 I	5.71E-02 H			☒	190 N	210 N	14 N	20000 N	780 N	240 E	2 E
1,1,1-Trichloroethane	71556	9.00E-02 W	2.86E-01 W			☒	1300 N	1000 N	120 N	180000 N	7000 N	980 E	0.9 E
1,1,2-Trichloroethane	79005	4.00E-03 I		5.70E-02 I	5.60E-02 I	☒	0.19 C	0.11 C	0.055 C	100 C	11 C	0.8 E	0.01 E
Trichloroethylene (TCE)	79016	6.00E-03 E		1.10E-02 W	6.00E-03 E	☒	1.6 C	1 C	0.29 C	520 C	58 C	3 E	0.02 E
Trichlorofluoromethane	75694	3.00E-01 I	2.00E-01 A			☒	1300 N	730 N	410 N	610000 N	23000 N	790 N	13 N
2,4,5-Trichlorophenol	95954	1.00E-01 I					3700 N	370 N	140 N	200000 N	7800 N	8200 S	120 E
2,4,6-Trichlorophenol	88062			1.10E-02 I	1.09E-02 I		6.1 C	0.57 C	0.29 C	520 C	58 C	150 C	0.06 E
2,4,5-Trichlorophenoxyacetic acid	93765	1.00E-02 I					370 N	37 N	14 N	20000 N	780 N		
2-(2,4,5-Trichlorophenoxy)propionic acid	93721	8.00E-03 I					290 N	29 N	11 N	16000 N	630 N		
1,1,2-Trichloropropane	598776	5.00E-03 I				☒	30 N	18 N	6.8 N	10000 N	390 N	13 N	0.14 N
1,2,3-Trichloropropane	96184	6.00E-03 I		7.00E+00 I		☒	0.0015 C	0.00089 C	0.00045 C	0.82 C	0.091 C	0.00003 C	6.000E-06 C
1,2,3-Trichloropropene	96195	5.00E-03 H				☒	30 N	18 N	6.8 N	10000 N	390 N		
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	3.00E+01 I	8.57E+00 H			☒	59000 N	31000 N	41000 N	1E+06 N	1000000 N	2400 S	3100 N
Tridiphane	58138082	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N		
Triethylamine	121448		2.00E-03 I				73 N	7.3 N					
Trifluralin	1582098	7.50E-03 I		7.70E-03 I			8.7 C	0.81 C	0.41 C	740 C	83 C		
**1,2,4-Trimethylbenzene	95636	5.00E-02 E				☒	300 N	180 N	68 N	100000 N	3900 N		
**1,3,5-Trimethylbenzene	108678	5.00E-02 E				☒	300 N	180 N	68 N	100000 N	3900 N	98 S	0.26 M
Trimethyl phosphate	512561			3.70E-02 H			1.8 C	0.17 C	0.085 C	150 C	17 C		
1,3,5-Trinitrobenzene	99354	5.00E-05 I					1.8 N	0.18 N	0.068 N	100 N	3.9 N		
Trinitrophenylmethylnitramine	479458	1.00E-02 H					370 N	37 N	14 N	20000 N	780 N		
2,4,6-Trinitrotoluene	118967	5.00E-04 I		3.00E-02 I			2.2 C	0.21 C	0.11 C	190 C	21 C		
Uranium (soluble salts)	7440611	3.00E-03 I					110 N	11 N	4.1 N	6100 N	230 N		
Vanadium	7440622	7.00E-03 H					260 N	26 N	9.5 N	14000 N	550 N		
Vanadium pentoxide	1314621	9.00E-03 I					330 N	33 N	12 N	18000 N	700 N		

Sources: I=IRIS H=HEAST A=HEAST alternate W=Withdrawn from IRIS or HEAST E=EPA-NCEA Regional Support provisional value O=Other EPA documents.

Basis: C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg-d/mg	CPSi kg-d/mg	VOC	Risk-Based Concentrations: Tap Water µg/L	Ambient Air µg/m3	Fish mg/kg	Soil Ingestion: Industrial mg/kg	Soil Ingestion: Residential mg/kg	Soil Screening Levels-Transfers from Soil to: Air mg/kg	Groundwater mg/kg
Vanadium sulfate	36907423	2.00E-02 H					730 N	73 N	27 N	41000 N	1600 N		
Vernam	1929777	1.00E-03 I					37 N	3.7 N	1.4 N	2000 N	78 N		
Vinclozolin	50471448	2.50E-02 I					910 N	91 N	34 N	51000 N	2000 N		
Vinyl acetate	108054	1.00E+00 H	5.71E-02 I				37000 N	210 N	1400 N	1E+06 N	78000 N	370 E	84 E
Vinyl bromide	593602		8.57E-04 I			☒	5.2 N	3.1 N				2 N	0.018 N
Vinyl chloride	75014			1.90E+00 H	3.00E-01 H	☒	0.019 C	0.021 C	0.0017 C	3 C	0.34 C	0.002 E	0.01 E
Warfarin	81812	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N	0.046 N	1800 N
m-Xylene	108323	2.00E+00 H	2.00E-01 W			☒	1400 N	730 N	2700 N	1E+06 N	160000 N	950 S	240 M
o-Xylene	9.55E+04	2.00E+00 H	2.00E-01 W			☒	1400 N	730 N	2700 N	1E+06 N	160000 N	730 S	1.50E+02 M
p-Xylene	1.06E+05		8.57E-02 W			☒	520 N	310 N				1000 S	2.20E+02 M
Xylene (mixed)	1.33E+06	2.00E+00 I				☒	12000 N	7300 N	2700 N	1E+06 N	160000 N	320 E	7.40E+01 E
Zinc	7.44E+06	3.00E-01 I					11000 N	1100 N	410 N	610000 N	23000 N		4.20E+04 E
Zinc phosphide	1.31E+06	3.00E-04 I					11 N	1.1 N	0.41 N	610 N	23 N		
Zineb	1.21E+07	5.00E-02 I					1800 N	180 N	68 N	100000 N	3900 N		

APPENDIX 2

Results of Voluntary Release Assessment Samples Collected at SWMU 001h

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001h, H-15

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4	EQ BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95
WID Sample Numbers:	RA-95-175	RA-95-176	RA-95-177	RA-95-178	RA-95-179	RA-95-183	RA-95-185	RA-95-187	RA-95-181
					RA-95-180	RA-95-184	RA-95-186	RA-95-188	RA-95-182
Analytes									
Leachable Metals (mg/L)									
Arsenic (As)	0.2 UB	0.2 U	0.1 UB	0.2 U	0.1 UB	0.2 U	0.2 UB	0.5 U	0.1 U
Barium (Ba)	0.43 UB	1.3 B	0.79 B	0.99 B	0.44 UB	1.1 B	0.36 UB	1.2 B	0.005 U
Cadmium (Cd)	0.005 U	0.01 U	0.005 U	0.01 U	0.005 U	0.02 U	0.005 U	0.02 U	0.005 U
Chromium (Cr)	0.02 U	0.04 U	0.02 U	0.04 U	0.02 U	0.04 U	0.02 U	0.1 U	0.02 U
Lead (Pb)	0.05 U	0.1 U	0.05 U	0.1 U	0.05 U	0.1 U	0.05 U	0.2 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001	0.0001 U	0.0001	0.0001 U	0.0001	0.0001 U	0.0001	0.0001 U
Thallium (Tl)	0.2 U	0.4 U	0.2 U	0.4 U	0.2 U	0.4 U	0.2 U	1 U	0.2 U
Leachable Volatiles (mg/L)									
1,1,1-Trichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
1,2-Dichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Chloroform	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Ethyl benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Toluene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ
Vinyl chloride	NA	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
Xylenes, total	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ

B Detected in the blank
EQ BLANK Equipment Rinse Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001h, Mudpit P-2

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	EQ BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95	10/24/95
WID Sample Numbers:	RA-95-189	RA-95-190	RA-95-191	RA-95-193	RA-95-195	RA-95-197	RA-95-199
			RA-95-192	RA-95-194	RA-95-196	RA-95-198	RA-95-200
Analytes							
Leachable Metals (mg/L)							
Arsenic (As)	0.1 UB	0.5 U	0.1 UB	0.5 U	0.1 UB	0.5 U	0.1 U
Barium (Ba)	0.28 UB	1.2 B	0.39 UB	1.2 B	0.29 UB	1.1 B	0.005 U
Cadmium (Cd)	0.005 U	0.02 U	0.005 U	0.02 U	0.005 U	0.02 U	0.005 U
Chromium (Cr)	0.02 U	0.1 U	0.02 U	0.1 U	0.02 U	0.1 U	0.02 U
Lead (Pb)	0.05 U	0.2 U	0.05 U	0.2 U	0.05 UJ	0.2 UJ	0.05 UJ
Mercury (Hg)	0.0001 U	0.0001	0.0001 U	0.0002	0.0001 U	0.0001	0.0001 U
Thallium (Tl)	0.2 U	1 U	0.2 U	1 U	0.2 U	1 U	0.2 U
Leachable Volatiles (mg/L)							
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

WIPP Soil Samples
Data Review Form

Statement of Purpose:

To review laboratory data packages for soil samples collected at SWMUs, evaluate data package completeness, and compare analytical quality control data to program objectives.

Section 1: Data Package Identification

P.O. Number: 500101 - Report 28312 No. Of Samples In Package: 26
Sample Collection Date: 10/24/95 Sample Receipt Date: 10/27/95
Sample Report Date: 11/15/95 Analytical Parameters: TCLP - VOCs, Metals
Sample Numbers in Data Package: RA-95-175 (P0327344), RA-95-176 (P0327345), RA-95-177 (P0327346), RA-95-178 (P0327347), RA-95-179 (P0327348), RA-95-180 (P0327349), RA-95-181 (P0327350), RA-95-182 (P0327351), RA-95-183 (P0327352), RA-95-184 (P0327353), RA-95-185 (P0327354), RA-95-186 (P0327355), RA-95-187 (P0327356), RA-95-188 (P0327357), RA-95-189 (P0327358), RA-95-190 (P0327359), RA-95-191 (P0327360), RA-95-192 (P0327361), RA-95-193 (P0327362), RA-95-194 (P0327363), RA-95-195 (P0327364), RA-95-196 (P0327365), RA-95-197 (P0327366), RA-95-198 (P0327367), RA-95-199 (P0327368), RA-95-200 (P0327369)

Data Reviewer: Donald K. Wambold Date of Review: 1/10/96

Symbols used in the sections below are defined as follows:

X	Included: no problem	R	Resubmission
*	Included: problems noted	NR	Not Required
O	Not Included		

Section 2. Data Summary

Data for the above listed samples are:

- ____ Acceptable for use
- X Acceptable for use with qualifications noted
- ____ Preliminary - pending action or verification
- ____ Unacceptable for use
- X To be reviewed by senior chemist

Reviewed by: [signature] Date: 1/23/96
— See note 10a.

Section 3. Data Package Completeness Review

X Chain of Custody/Request for Analysis
X Laboratory Analysis Report
X[1] Holding Times
X[2] Method Reporting Limits
X Dilution Factors
X[3] Quality Control Report

Section 4. QC Review (from Laboratory Quality Control Report)

Volatiles

X Method Blank
O[4] Leachate Blank
X Surrogate Standard Recovery
NR[5] Matrix Spike/Matrix Spike Duplicate Samples
X Laboratory Control Sample
NR Duplicate Sample

Metals

X Method Blank
*[6] Leachate Blank
O[7] Matrix Spike/Matrix Spike Duplicate Samples
*[8] Laboratory Control Sample
NR Duplicate Sample

Section 5. Calibration Data

Volatiles

X GC/MS Analysis Log
X GC/MS Initial Calibration Data
X GC/MS Continuing Calibration Data

Metals

X[9] ICP Analysis Log
(*) R ~~O~~[9,10] ICP Initial Calibration Data
(*) R ~~O~~[9,10] ICP Continuing Calibration Data
X[9] CVAA Analysis Log
X[9] CVAA Initial Calibration Data
(*) R ~~O~~[9,10] CVAA Continuing Calibration Data

(*) MRC, 1/23/96; See note 10a.

Section 6. Comments

1. The 14-day holding time for volatiles analysis was exceeded for sample RA-95-181, therefore, all VOC results for this sample were qualified as estimated, J.

2. The method reporting limits (MRLs) and sample results for 1,1,1-trichloroethane, ethyl benzene, chloroform, total xylenes, and thallium were not evaluated relative to the toxicity characteristic regulatory levels because limits have not been promulgated for these analytes.

3. The information provided in the quality control (QC) summary was not complete for all reported samples and could not be directly referenced to the sample results and/or analysis logs. The "supplemental information" section of the quality control summary provides analytical and extraction batch numbers which can be referenced to the appropriate QC samples in the QC summary. The laboratory relies on these batch references, which are stored in the laboratory information management system (LIMS), to relate the appropriate QC data to sample batches, and does not typically include the batch numbers or internal laboratory QC sample numbers on the analysis logs. Therefore, QC sample results generally cannot be traced to the raw analytical data.

4. A leachate blank analysis was not provided for the TCLP volatiles analyses in this package. Based on the laboratory's procedures, leachate blanks are performed once per twenty samples processed through the TCLP extraction procedure on each extraction apparatus. The leachate blank associated with the samples in this package may not be reported because it is reported in another package with the remaining samples in the extraction batch. There were not any detections of volatile compounds reported in the data package, and no common volatile laboratory contaminants or other volatile compounds were reported in the method blanks. Therefore, the potential for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

5. A matrix spike/matrix spike duplicate was not performed for the TCLP volatile analyses due to limited sample volume produced during the TCLP extraction.

6. The laboratory provided metal leachate blank sample results for extraction batches 368 and 369 which were considered representative of the extraction conditions for the WIPP samples in this data package. Specific sample associations for the blanks were not included, therefore the highest results from the representative blanks were used to evaluate the WIPP sample results from the TCLP extraction batches in the case. (Note: the two blanks provided, while identified with different batch numbers, were both prepared during the same TCLP extraction). Arsenic and barium were detected at or above the MRL in the leachate blank samples. Arsenic results for sample RA-95-177, and both arsenic and barium results for samples RA-95-175, RA-95-180, RA-95-186, RA-95-189, RA-95-192, and RA-95-196, were less than five times the blank concentration, and therefore were qualified as "UB" (not detected) due to blank contamination. The barium results for samples RA-95-176, RA-95-177, RA-95-178, RA-95-184, RA-95-188, RA-95-190,

RA-95-194, and RA-95-198 were not less than five times the blank concentration, and therefore were qualified with a "B" to indicate that the analyte was detected in the blank.

7. Matrix spike/matrix spike duplicate (MS/MSD) recoveries were not included in the QC summary for mercury analysis batch 38664 because the MS/MSD was not performed on a sample in this batch. An MS/MSD was performed for batch 38665, which was analyzed sequentially with batch 38664. Because the MS/MSD spike preparation occurs at the time of sample analysis, the MS/MSD from batch 38665 was considered representative of the sample matrix and analytical conditions, therefore qualification was not performed. Additionally, method control was verified by the analysis of two sets of MS/MSD samples for batch 38665 (one near the beginning of the sample batch, and one near the end, prior to the samples from batch 38664).

   The MS/MSD recoveries for lead (66.6%/69.6%) were below the minimum limit of 75% for batch 38634. Therefore, the lead results for samples RA-95-19~~6~~, RA-95-19~~8~~, and RA-95-2~~00~~ from batch 38634 were qualified as estimated, J.
   199 MRL 1/23/96

8. The laboratory control sample (LCS) recovery for lead (71.6%) from laboratory analytical batch 38634 was below both the laboratory's minimum control limit of 81.2% and the EPA Functional Guidelines criteria of 80%. Therefore, the lead results for samples RA-95-196, RA-95-198, and RA-95-200 from batch 38634 were qualified as estimated, J.

9. Representative calibration data provided with the data package were reviewed to evaluate the calibration procedures and protocols followed by the laboratory, and to assess the operating conditions of the instruments used for analysis of the samples in the data package. Specific items reviewed include: 1) analysis run logs, and initial and continuing calibration summaries for volatiles analyses of laboratory batches 38743 and 38768; 2) analysis run logs and initial calibration summaries for ICP metals analyses of laboratory batch 38598; and 3) analysis run logs, and initial calibration data for CVAA mercury analyses of laboratory batches 38664 and 38665. WIPP sample results did not require qualification based on the representative calibration information that was provided in the data package.

10. The following specific items were not included by the laboratory, and could not be evaluated for potential effects on the reported sample results: 1) initial and continuing calibration data for ICP metals analyses of arsenic, barium, cadmium, chromium, and lead for laboratory batch 38634 (samples RA-95-196, RA-95-198, and RA-95-200), and continuing calibration data for ICP metals analyses of laboratory batch 38598 (samples RA-95-175, RA-95-176, RA-95-177, RA-95-178, RA-95-180, RA-95-182, RA-95-184, RA-95-186, RA-95-188, RA-95-190, RA-95-192, and RA-95-194); and 3) continuing calibration data for CVAA mercury analyses of laboratory batches 38664 and 38665 (all metals samples).

10a. Additional initial and continuing calibration data for ICP metals and CVAA mercury analyses were provided by the laboratory for the sample batches in this data package. WIPP samples results did not require qualification based on review of the additional calibration data.
MRC, 1/23/96

Signatures below constitutes validation of this record.

Validator:

Printed Name	Signature	Date
Donald K. Wainwright	[illegible]	1/10/96

QA/QC Reviewer:

Printed Name	Signature	Date
MARK R. COLEMAN	Mark R Coleman	1/23/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-175 TCLP
NUS SAMPLE NO: P0327344
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/30(1230)		
		End Date/Time		10/31(0630)		
		Extraction Fluid		1		
		Final Leachate pH		5.0		
3	AASL	Arsenic, Leachable (As)	1	0.2	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.43	mg/L	UB
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED
Reviewed By [signature]
Date 11/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-176 TCLP
NUS SAMPLE NO: P0327345
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/30(1230)		
		End Date/Time		10/31(0630)		
		Extraction Fluid		2		
		Final Leachate pH		5.8		
3	AASL	Arsenic, Leachable (As)	2	< 0.2	mg/L	
4	ABAL	Barium, Leachable (Ba)	2	1.3	mg/L	B
5	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L	
6	ACRL	Chromium, Leachable (Cr)	2	< 0.04	mg/L	
7	APBL	Lead, Leachable (Pb)	2	< 0.1	mg/L	
8	AHGL	Mercury, Leachable (Hg)	1	0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	2	< 0.4	mg/L	

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

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November 15, 1995
Report No.: 00028312
Section A Page 3

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-177 TCLP
NUS SAMPLE NO: P0327346
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/30(1230)		
		End Date/Time		10/31(0630		
		Extraction Fluid		1		
		Final Leachate pH		5.1		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.79	mg/L	B
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/10/96

Halliburton NUS CORPORATION

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November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-178 TCLP
NUS SAMPLE NO: P0327347
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/30(1230)		
		End Date/Time		10/31(0630)		
		Extraction Fluid		2		
		Final Leachate pH		5.3		
3	AASL	Arsenic, Leachable (As)	2	< 0.2	mg/L	
4	ABAL	Barium, Leachable (Ba)	2	0.99	mg/L	B
5	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L	
6	ACRL	Chromium, Leachable (Cr)	2	< 0.04	mg/L	
7	APBL	Lead, Leachable (Pb)	2	< 0.1	mg/L	
8	AHGL	Mercury, Leachable (Hg)	1	0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	2	< 0.4	mg/L	

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By [signature]

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312
Section A Page 5

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-179 ZHE
NUS SAMPLE NO: P0327348
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		10/31(1400)
		End Date/Time		11/01(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
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TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-180 TCLP
NUS SAMPLE NO: P0327349
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/30(1230)		
		End Date/Time		10/31(0630)		
		Extraction Fluid		1		
		Final Leachate pH		5.0		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.44	mg/L	UB
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 11/16/95

Halliburton NUS CORPORATION

NUS LABORATORY
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TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312
Section A Page 7

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-181 ZHE
NUS SAMPLE NO: P0327350
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		30-Oct-95
		End Date/Time		30-Oct-95
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/10/96

Halliburton NUS
CORPORATION

NUS LABORATORY
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November 15, 1995
Report No.: 00028312
Section A Page 8

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-182 TCLP
NUS SAMPLE NO: P0327351
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		6.2
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	< 0.005 mg/L
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By [signature]
Date 11/8/96

Halliburton NUS
CORPORATION

NUS LABORATORY
5350 Campbells Run Road
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November 15, 1995
Report No.: 00028312
Section A Page 9

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-183 ZHE
NUS SAMPLE NO: P0327352
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		10/31(1400)
		End Date/Time		11/01(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 11/10/95

Halliburton NUS CORPORATION

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November 15, 1995
Report No.: 00028312
Section A Page 10

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-184 TCLP
NUS SAMPLE NO: P0327353
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		10/30(1230)
		End Date/Time		10/31(0630)
		Extraction Fluid		2
		Final Leachate pH		5.9
3	AASL	Arsenic, Leachable (As)	2	< 0.2 mg/L
4	ABAL	Barium, Leachable (Ba)	2	1.1 mg/L B
5	ACDL	Cadmium, Leachable (Cd)	5	< 0.02 mg/L
6	ACRL	Chromium, Leachable (Cr)	2	< 0.04 mg/L
7	APBL	Lead, Leachable (Pb)	2	< 0.1 mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0001 mg/L
9	ATLL	Thallium, Leachable (Tl)	2	< 0.4 mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By _____

Date 1/10/96

Halliburton NUS
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Pittsburgh, Pennsylvania 15205

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November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-185 ZHE
NUS SAMPLE NO: P0327354
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		10/31(1400)
		End Date/Time		11/01(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/10/96

Halliburton NUS CORPORATION

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November 15, 1995
Report No.: 00028312
Section A Page 12

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-186 TCLP
NUS SAMPLE NO: P0327355
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/31(1330)		
		End Date/Time		11/01(0730)		
		Extraction Fluid		1		
		Final Leachate pH		5.0		
3	AASL	Arsenic, Leachable (As)	1	0.2	mg/L	JB
4	ABAL	Barium, Leachable (Ba)	1	0.36	mg/L	JB
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-187 ZHE
NUS SAMPLE NO: P0327356
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		10/31(1400)
		End Date/Time		11/01(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
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Pittsburgh, Pennsylvania 15205

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November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-188 TCLP
NUS SAMPLE NO: P0327357
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		10/31(1330)	
		End Date/Time		11/01(0730)	
		Extraction Fluid		2	
		Final Leachate pH		4.9	
3	AASL	Arsenic, Leachable (As)	5	< 0.5	mg/L
4	ABAL	Barium, Leachable (Ba)	5	1.2	mg/L B
5	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
6	ACRL	Chromium, Leachable (Cr)	5	< 0.1	mg/L
7	APBL	Lead, Leachable (Pb)	5	< 0.2	mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0001	mg/L
9	ATLL	Thallium, Leachable (Tl)	5	< 1	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By [signature]

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
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November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-189 TCLP
NUS SAMPLE NO: P0327358
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		10/31(1330)	
		End Date/Time		11/01(0730)	
		Extraction Fluid		1	
		Final Leachate pH		4.9	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.28	mg/L UB
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/11/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-190 TCLP
NUS SAMPLE NO: P0327359
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		10/31(1330)	
		End Date/Time		11/01(0730)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	5	< 0.5	mg/L
4	ABAL	Barium, Leachable (Ba)	5	1.2	mg/L B
5	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
6	ACRL	Chromium, Leachable (Cr)	5	< 0.1	mg/L
7	APBL	Lead, Leachable (Pb)	5	< 0.2	mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0001	mg/L
9	ATLL	Thallium, Leachable (Tl)	5	< 1	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312
Section A Page 17

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-191 ZHE
NUS SAMPLE NO: P0327360
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		10/31(1400)
		End Date/Time		11/01(0800
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 15, 1995
Report No.: 00028312
Section A Page 18

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-192 TCLP
NUS SAMPLE NO: P0327361
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		10/31(1330)	
		End Date/Time		11/01(0730)	
		Extraction Fluid		1	
		Final Leachate pH		4.9	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L JB
4	ABAL	Barium, Leachable (Ba)	1	0.39	mg/L JB
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 11/6/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-193 ZHE
NUS SAMPLE NO: P0327362
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		10/31(1400)
		End Date/Time		11/01(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 11/12/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-194 TCLP
NUS SAMPLE NO: P0327363
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		10/31(1330)	
		End Date/Time		11/01(0730)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	5	< 0.5	mg/L
4	ABAL	Barium, Leachable (Ba)	5	1.2	mg/L B
5	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
6	ACRL	Chromium, Leachable (Cr)	5	< 0.1	mg/L
7	APBL	Lead, Leachable (Pb)	5	< 0.2	mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0002	mg/L
9	ATLL	Thallium, Leachable (Tl)	5	< 1	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By

Date 1/16/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-195 ZHE
NUS SAMPLE NO: P0327364
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/01(1300)
		End Date/Time		11/02(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-196 TCLP
NUS SAMPLE NO: P0327365
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		10/31(1330)		
		End Date/Time		11/01(0730)		
		Extraction Fluid		1		
		Final Leachate pH		5.3		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.29	mg/L	UB
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	J
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-197 ZHE
NUS SAMPLE NO: P0327366
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/01(1300)
		End Date/Time		11/02(0800)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-198 TCLP
NUS SAMPLE NO: P0327367
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		10/31(1330)	
		End Date/Time		11/01(0730)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	5	< 0.5	mg/L
4	ABAL	Barium, Leachable (Ba)	5	1.1	mg/L B
5	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
6	ACRL	Chromium, Leachable (Cr)	5	< 0.1	mg/L
7	APBL	Lead, Leachable (Pb)	5	< 0.2	mg/L J
8	AHGL	Mercury, Leachable (Hg)	1	0.0001	mg/L
9	ATLL	Thallium, Leachable (Tl)	5	< 1	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By

Date 11/20/95

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-199 ZHE
NUS SAMPLE NO: P0327368
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		30-Oct-95
		End Date/Time		30-Oct-95
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/10/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 15, 1995
Report No.: 00028312

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-200 TCLP
NUS SAMPLE NO: P0327369
P.O. NO.: 500101

DATE SAMPLED: 24-OCT-95
DATE RECEIVED: 27-OCT-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		5.2
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	< 0.005 mg/L
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L J
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/12/96

APPENDIX 3

Results of Voluntary Release Assessment Samples Collected at SWMU 001L

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001l, Mudpit P-5

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	EQ BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95
WID Sample Numbers:	RA-95-240	RA-95-241	RA-95-242	RA-95-244	RA-95-248	RA-95-250	RA-95-246
			RA-95-243	RA-95-245	RA-95-249	RA-95-251	RA-95-247
Analytes							
Leachable Metals (mg/L)							
Arsenic (As)	0.1 U	0.1 UB	0.2 U	1 U	0.2 U	0.5 U	0.1 U
Barium (Ba)	0.68	0.83	1.1	1.3	1.3	1.5	0.033
Cadmium (Cd)	0.005 U	0.01 U	0.02 U	0.05 U	0.02 U	0.02 U	0.005 U
Chromium (Cr)	0.02 U	0.02 U	0.04 U	0.2 U	0.04 U	0.1 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.1 U	0.5 U	0.1 U	0.2 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Thallium (Tl)	0.2 U	0.2 U	0.4 U	2 U	0.4 U	1 U	0.2 U
Leachable Volatiles (mg/L)							
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 0011, WIPP-12

Bore Number:	BORE #4	BORE #4	BORE #5	BORE #5	BORE #6	BORE #6	FD BLANK
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	
Sample Date:	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95	11/7/95
WID Sample Numbers:	RA-95-252	RA-95-253	RA-95-254	RA-95-256	RA-95-258	RA-95-260	RA-95-262
			RA-95-255	RA-95-257	RA-95-259	RA-95-261	RA-95-263
Analytes							
Leachable Metals (mg/L)							
Arsenic (As)	0.1 U	0.1 UB	0.1 U	0.2 U	0.1 UB	0.2 U	0.1 U
Barium (Ba)	0.34	0.34	0.43	1.4	1.4	1.7	0.036
Cadmium (Cd)	0.005 U	0.005 U	0.005 U	0.02 UJ	0.005 UJ	0.02 UJ	0.005 UJ
Chromium (Cr)	0.02 U	0.02 U	0.02 U	0.04 U	0.02 U	0.04 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.05 U	0.1 U	0.05 U	0.1 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Thallium (Tl)	0.2 U	0.2 U	0.2 U	0.4 U	0.2 U	0.4 U	0.2 U
Leachable Volatiles (mg/L)							
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

WIPP Soil Samples
Data Review Form

Statement of Purpose:

To review laboratory data packages for soil samples collected at SWMUs, evaluate data package completeness, and compare analytical quality control data to program objectives.

Section 1: Data Package Identification

P.O. Number: 500101 - Report 28449

No. Of Samples In Package: 64

Sample Collection Date: 11/6/95, 11/7/95, 11/9/95

Sample Receipt Date: 11/10/95

Sample Report Date: 11/29/95

Analytical Parameters: TCLP - VOCs, Alcohols, SVOCs, PCBs, and Metals

Sample Numbers in Data Package: RA-95-201 (P0328703), RA-95-202 (P0328704), RA-95-203 (P0328705), RA-95-204 (P0328706), RA-95-205A (P0328707), RA-95-205B (P0328708), RA-95-206 (P0328709), RA-95-207 (P0328710), RA-95-208 (P0328711), RA-95-209 (P0328712), RA-95-210 (P0328713), RA-95-211 (P0328714), RA-95-212 (P0328715), RA-95-213 (P0328716), RA-95-214 (P0328717), RA-95-215 (P0328718), RA-95-216 (P0328719), RA-95-217 (P0328720), RA-95-218 (P0328721), RA-95-219 (P0328722), RA-95-220 (P0328723), RA-95-221 (P0328724), RA-95-222 (P0328725), RA-95-223 (P0328726), RA-95-224 (P0328727), RA-95-225 (P0328728), RA-95-226 (P0328729), RA-95-227 (P0328730), RA-95-228 (P0328731), RA-95-229 (P0328732), RA-95-230 (P0328733), RA-95-231 (P0328734), RA-95-232 (P0328735), RA-95-233 (P0328736), RA-95-234 (P0328737), RA-95-235 (P0328738), RA-95-236 (P0328739), RA-95-237 (P0328740), RA-95-238 (P0328741), RA-95-239 (P0328742), RA-95-240 (P0328743), RA-95-241 (P0328744), RA-95-242 (P0328745), RA-95-243 (P0328746), RA-95-244 (P0328747), RA-95-245 (P0328748), RA-95-246 (P0328749), RA-95-247 (P0328750), RA-95-248 (P0328751), RA-95-249 (P0328752), RA-95-250 (P0328753), RA-95-251 (P0328754), RA-95-252 (P0328755), RA-95-253 (P0328756), RA-95-254 (P0328757), RA-95-255 (P0328758), RA-95-256 (P0328759), RA-95-257 (P0328760), RA-95-258 (P0328761), RA-95-259 (P0328762), RA-95-260 (P0328763), RA-95-261 (P0328764), RA-95-262 (P0328765), RA-95-263 (P0328766)

Data Reviewer: Donald K. Wambold

Date of Review: 1/17/96

Symbols used in the sections below are defined as follows:

X	Included: no problem	R	Resubmission
*	Included: problems noted	NR	Not Required
O	Not Included		

Section 2. Data Summary

Data for the above listed samples are:

_____ Acceptable for use
X Acceptable for use with qualifications noted
_____ Preliminary - pending action or verification
_____ Unacceptable for use
_____ To be reviewed by senior chemist

Reviewed by: _____ Date: _____

Section 3. Data Package Completeness Review

X	Chain of Custody/Request for Analysis
X	Laboratory Analysis Report
X[1]	Holding Times
X[2]	Method Reporting Limits
X	Dilution Factors
X[3]	Quality Control Report

Section 4. QC Review (from Laboratory Quality Control Report)

Volatiles

X	Method Blank
O[4]	Leachate Blank
X	Surrogate Standard Recovery
NR[5]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Alcohols

X	Method Blank
O[4]	Leachate Blank
X	Surrogate Standard Recovery
NR[5]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Semivolatiles

X	Method Blank
X	Leachate Blank
X	Surrogate Standard Recovery
O[6]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

PCBs

X	Method Blank
O[7]	Leachate Blank
X	Surrogate Standard Recovery
O[6]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Metals

X	Method Blank
*[8]	Leachate Blank
*[9]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Section 5. Calibration Data

Volatiles

X[10]	GC/MS Analysis Log
*[10,11]	GC/MS Initial Calibration Data
*[10,11,12]	GC/MS Continuing Calibration Data

Alcohols

X[10]	GC Analysis Log
X[10]	GC Initial Calibration Data
X[10]	GC Continuing Calibration Data

Semivolatiles

O[10,14]	GC/MS Analysis Log
X[10]	GC/MS Initial Calibration Data
X[10]	GC/MS Continuing Calibration Data

PCBs

O[10,14]	GC Analysis Log
*[10,13]	GC Initial Calibration Data
*[10,13]	GC Continuing Calibration Data

Metals

X[10]	ICP Analysis Log
X[10]	ICP Initial Calibration Data
O[10,14]	ICP Continuing Calibration Data
X[10]	CVAA Analysis Log
X[10]	CVAA Initial Calibration Data
X[10]	CVAA Continuing Calibration Data

Section 6. Comments

1. The holding times were exceeded for the analysis of alcohols in samples RA-95-223 and RA-95-237, and for the preparation of samples for semivolatile organic compounds and polychlorinated biphenyls (PCBs) in samples RA-95-227 and RA-95-238. Therefore, all analytical results for these analyses in the respective samples were qualified as estimated, J.

2. The method reporting limits (MRLs) and sample results were evaluated relative to the toxicity characteristic regulatory levels for analytes which have promulgated limits. No MRLs reported by the laboratory for these analytes were above the promulgated limits.

3. The information provided in the quality control (QC) summary was not complete for all reported samples and could not be directly referenced to the sample results and/or analysis logs. The "supplemental information" section of the quality control summary provides analytical and extraction batch numbers which can be referenced to the appropriate QC samples in the QC summary. The laboratory relies on these batch references, which are stored in the laboratory information management system (LIMS), to relate the appropriate QC data to sample batches, and does not typically include the batch numbers or internal laboratory QC sample numbers on the analysis logs. Therefore, QC sample results generally cannot be traced to the raw analytical data.

4. A leachate blank analysis was not provided for the TCLP volatiles and alcohols analyses in this package. Based on the laboratory's procedures, leachate blanks are performed once per twenty samples processed through the TCLP extraction procedure on each extraction apparatus. The leachate blank associated with the samples in this package may not be reported because it is reported in another package with the remaining samples in the extraction batch. There were no detections of volatile compounds or alcohols reported in the data package. Furthermore, no common volatile or alcohol laboratory contaminants, or other volatile organics, were reported in the method blanks. Therefore, the potential

for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

5. A matrix spike/matrix spike duplicate (MS/MSD) was not performed for the TCLP volatile and alcohols analyses due to limited sample volume produced during the TCLP extraction.

6. A MS/MSD was not performed for the TCLP semivolatiles and PCBs even though a separate sample preparation was performed following the TCLP extraction procedure. Because the MS/MSD was not performed, it was not possible to evaluate possible matrix effects on TCLP sample preparation and analysis for semivolatiles and PCBs.

7. A leachate blank analysis was not provided for the TCLP PCBs analyses in this package. Although leachate blank data was provided for the semivolatiles from the same TCLP extraction batch, an aliquot was not prepared or analyzed for PCBs. There were not any detections of PCBs reported for the samples or method blanks in this data package. Therefore, the potential for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

8. The laboratory provided results for metal leachate blanks from extraction batches 372 and 373, which were extracted one to three days prior to the WIPP samples reported in this data package, but were assumed to be representative of the extraction conditions for the WIPP samples. Because specific sample associations for each blank were not included, the highest results from the representative blanks were used to evaluate the WIPP sample results in the data package. Arsenic was detected at or above the MRL in the leachate blank samples. Arsenic results for samples RA-95-201, RA-95-202, RA-95-204, RA-95-207, RA-95-210, RA-95-213, RA-95-219, RA-95-222, RA-95-231, RA-95-235, RA-95-241, RA-95-253, and RA-95-259 were less than five times the blank concentration, and therefore were qualified as "UB" (not detected) due to blank contamination.

9. The MS/MSD recoveries for cadmium (50%/70%) were below the EPA Functional Guidelines minimum criteria of 75% for batch 38954. Therefore, the cadmium results for samples RA-95-257, RA-95-259, RA-95-261, and RA-95-263 from batch 38954 were qualified as estimated, J.

10. Representative calibration data provided with the data package were reviewed to evaluate the calibration procedures and protocols followed by the laboratory, and to assess the operating conditions of the instruments used for analysis of the samples in the data package. Specific items reviewed include: 1) analysis run logs, and initial and continuing calibration summaries for volatiles analyses of laboratory batches 38949, 38974, and 39016; 2) analysis run logs, and initial and continuing calibration summaries for alcohols analysis of laboratory batch 39014; 3) initial and continuing calibration summaries for semivolatiles analysis of laboratory batch 38912; 4) initial and continuing calibration summaries for PCBs analysis of laboratory batch 38911; 5) analysis run logs and initial calibration summaries for ICP metals analyses of laboratory batches 38885, 38953, and

38954; and 6) analysis run logs, and initial and continuing calibration data for CVAA mercury analyses of laboratory batches 38962 and 38963. WIPP sample results for volatiles, semivolatiles, and PCBs required qualification based on the representative calibration information that was provided in the data package (see sections below).

11. Cyclohexane was not included as a target analyte in the initial or continuing calibration standard analysis summaries, but was reported as an analyte for samples RA-95-211, RA-95-214, RA-95-217, RA-95-220, RA-95-223, RA-95-224, RA-95-229, RA-95-232, and RA-95-237. Because calibration of cyclohexane was not apparent in the data provided, but qualitative determinations could be made using the GC/MS system, the results for this analyte were qualified as estimated, J.

12. The continuing calibration percent differences (%D) reported for volatiles analysis of trichlorofluoromethane from laboratory analysis batch 38974, and trichlorofluoromethane, trichloroethene, 4-methyl-2-pentanone (methyl isobutyl ketone [MIBK]), and bromoform from laboratory batch 39016 exceeded the EPA Functional Guidelines maximum criteria of 25%. Therefore, the results for trichlorofluoromethane for samples RA-95-211, RA-95-214, RA-95-217, RA-95-220, RA-95-223, RA-95-224, and RA-95-237 (from batch 38974), and the results for trichlorofluoromethane, trichloroethene, 4-methyl-2-pentanone (methyl isobutyl ketone [MIBK]), and bromoform for samples RA-95-229 and RA-95-232 (from batch 39016), were qualified as estimated, J.

13. The initial and continuing calibrations for the PCBs analysis did not incorporate standards for each of the PCBs that were being analyzed. The calibrations only included standards for PCB-1242 and PCB-1260. The remaining PCBs exhibit responses that are similar enough to the two standards that it would be possible to determine if these analytes were present in the samples. However, because accurate qualitative identification and quantitative measurement techniques were not demonstrated for instrument responses for PCB-1221, PCB-1232, PCB-1016, PCB-1248, and PCB-1254, the results for these analytes in samples RA-95-209, RA-95-212, RA-95-215, RA-95-218, RA-95-221, RA-95-225, RA-95-227, RA-95-230, RA-95-233, and RA-95-238 were qualified as estimated, J.

14. The following specific items were not included by the laboratory, and could not be evaluated for potential effects on the reported sample results: 1) analysis run logs for semivolatiles analysis of laboratory batch 38912; 2) analysis run logs for PCBs analysis of laboratory batch 38911 (reported from the run on 11/4/95); and 3) continuing calibration data for ICP metals analyses of laboratory batches 38885, 38953, and 38954.

Signatures below constitutes validation of this record.

Validator: Donald K. Wambold	Donald K. Wambold	1/19/96
Printed Name	Signature	Date
QA/QC Reviewer: MARK R. COLEMAN	Mark R. Coleman	1/26/96
Printed Name	Signature	Date

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-240 TCLP
NUS SAMPLE NO: P0328743
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		4.9	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.68	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-241 TCLP
NUS SAMPLE NO: P0328744
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		6.2	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.83	mg/L
6	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:
6 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449
Section A Page 52

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-242 TCLP
NUS SAMPLE NO: P0328745
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
2	S904	Zero Headspace Extraction [ZHE]			
		Begin Date/Time		11/17(1330)	
		End Date/Time		11/18(0730)	
18	OVZHE	VOLATILES - TCLP/ZHE			
		1,1,1-trichloroethane	10	< 0.05	mg/L
		1,2-dichloroethane	10	< 0.05	mg/L
		benzene	10	< 0.05	mg/L
		chloroform	10	< 0.05	mg/L
		ethyl benzene	10	< 0.05	mg/L
		methyl benzene [toluene]	10	< 0.05	mg/L
		vinyl chloride	10	< 0.1	mg/L
		xylenes, total	10	< 0.05	mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-243 TCLP
NUS SAMPLE NO: P0328746
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	2	< 0.2	mg/L
4	ABAL	Barium, Leachable (Ba)	2	1.1	mg/L
6	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
7	ACRL	Chromium, Leachable (Cr)	2	< 0.04	mg/L
8	APBL	Lead, Leachable (Pb)	2	< 0.1	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	2	< 0.4	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By _____

Date 1/9/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-244 TCLP
NUS SAMPLE NO: P0328747
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/17(1330)
		End Date/Time		11/18(0730)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

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November 29, 1995
Report No.: 00028449
Section A Page 55

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-245 TCLP
NUS SAMPLE NO: P0328748
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/16(1400)
		End Date/Time		11/17(0630)
		Extraction Fluid		2
		Final Leachate pH		5.8
3	AASL	Arsenic, Leachable (As)	10	< 1 mg/L
4	ABAL	Barium, Leachable (Ba)	10	1.3 mg/L
6	ACDL	Cadmium, Leachable (Cd)	10	< 0.05 mg/L
7	ACRL	Chromium, Leachable (Cr)	10	< 0.2 mg/L
8	APBL	Lead, Leachable (Pb)	10	< 0.5 mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
13	ATLL	Thallium, Leachable (Tl)	10	< 2 mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By _____

Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-246 TCLP
NUS SAMPLE NO: P0328749
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(0900)
		End Date/Time		11/16(0900)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-247 TCLP
NUS SAMPLE NO: P0328750
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		5.8
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.033 mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-248 TCLP
NUS SAMPLE NO: P0328751
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/17(1330)
		End Date/Time		1/18(0730)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

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CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-249 TCLP
NUS SAMPLE NO: P0328752
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	2	< 0.2	mg/L
4	ABAL	Barium, Leachable (Ba)	2	1.3	mg/L
6	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
7	ACRL	Chromium, Leachable (Cr)	2	< 0.04	mg/L
8	APBL	Lead, Leachable (Pb)	2	< 0.1	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	2	< 0.4	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By [signature]

Date 1/19/96

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CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-250 TCLP
NUS SAMPLE NO: P0328753
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/20(1250)
		End Date/Time		11/21(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-251 TCLP
NUS SAMPLE NO: P0328754
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	5	< 0.5	mg/L
4	ABAL	Barium, Leachable (Ba)	5	1.5	mg/L
6	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
7	ACRL	Chromium, Leachable (Cr)	5	< 0.1	mg/L
8	APBL	Lead, Leachable (Pb)	5	< 0.2	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	5	< 1	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
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November 29, 1995
Report No.: 00028449
Section A Page 62

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-252 TCLP
NUS SAMPLE NO: P0328755
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		1	
		Final Leachate pH		4.8	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.34	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-253 TCLP
NUS SAMPLE NO: P0328756
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		11/16(1400)		
		End Date/Time		11/17(0630)		
		Extraction Fluid		1		
		Final Leachate pH		4.9		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.34	mg/L	
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

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Pittsburgh, Pennsylvania 15205

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-254 TCLP
NUS SAMPLE NO: P0328757
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/17(1330)
		End Date/Time		11/18(0730)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-255 TCLP
NUS SAMPLE NO: P0328758
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		1	
		Final Leachate pH		4.9	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.43	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
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Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-256 TCLP
NUS SAMPLE NO: P0328759
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/17(1330)
		End Date/Time		11/18(0730)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-257 TCLP
NUS SAMPLE NO: P0328760
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		2	
		Final Leachate pH		5.7	
3	AASL	Arsenic, Leachable (As)	2	< 0.2	mg/L
4	ABAL	Barium, Leachable (Ba)	2	1.4	mg/L
6	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L J
7	ACRL	Chromium, Leachable (Cr)	2	< 0.04	mg/L
8	APBL	Lead, Leachable (Pb)	2	< 0.1	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	2	< 0.4	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.
This sample was analyzed as a matrix spike. Recovery of the spike was outside established acceptance limits indicating the presence of a possible matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

26 An elevated detection limit was reported on this attribute due to sample matrix interference.

29 An elevated detection limit was reported on this attribute due to sample matrix interference.

32 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By _____

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-258 TCLP
NUS SAMPLE NO: P0328761
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/17(1330)
		End Date/Time		11/18(0730)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]
Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449
Section A Page 69

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-259 TCLP
NUS SAMPLE NO: P0328762
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		11/16(1400)		
		End Date/Time		11/17(0630)		
		Extraction Fluid		1		
		Final Leachate pH		6.2		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	1.4	mg/L	
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	J
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-260 TCLP
NUS SAMPLE NO: P0328763
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/20(1250)
		End Date/Time		11/21(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-261 TCLP
NUS SAMPLE NO: P0328764
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/16(1400)
		End Date/Time		11/17(0630)
		Extraction Fluid		2
		Final Leachate pH		5.6
3	AASL	Arsenic, Leachable (As)	2	< 0.2 mg/L
4	ABAL	Barium, Leachable (Ba)	2	1.7 mg/L
6	ACDL	Cadmium, Leachable (Cd)	3	< 0.02 mg/L J
7	ACRL	Chromium, Leachable (Cr)	2	< 0.04 mg/L
8	APBL	Lead, Leachable (Pb)	2	< 0.1 mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
13	ATLL	Thallium, Leachable (Tl)	2	< 0.4 mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
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November 29, 1995
Report No.: 00028449
Section A Page 72

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-262 TCLP
NUS SAMPLE NO: P0328765
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(0900)
		End Date/Time		11/16(0900)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED

Reviewed By [signature]
Date 11/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
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TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-263 TCLP
NUS SAMPLE NO: P0328766
P.O. NO.: 500101

DATE SAMPLED: 07-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Final Leachate pH		6.0	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.036	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L J
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

APPENDIX 4

Results of Voluntary Release Assessment Samples Collected at SWMU 001s

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001s

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	60-72	12-24	60-72	12-24	60-72	12-24	60-72
Sample Date:	11/9/95	11/13/95	11/9/95	11/13/95	11/9/95	11/13/95	11/9/95	11/13/95
WID Sample Numbers:	RA-95-201	RA-95-264	RA-95-202	RA-95-265	RA-95-203	RA-95-266	RA-95-207	RA-95-268
					RA-95-204	RA-95-267	RA-95-208	RA-95-269
Analytes								
Leachable Metals (mg/L)								
Arsenic (As)	0.2 UB	0.2 U	0.2 UB	0.1 UB	0.1 UB	0.1 U	0.1 UB	0.1 U
Barium (Ba)	0.66	0.71	0.54	0.64	0.59	0.6	0.53	0.66
Cadmium (Cd)	0.01 U	0.02 UJ	0.005 U	0.01 UJ	0.005 U	0.01 UJ	0.005 U	0.005 UJ
Chromium (Cr)	0.02 U	0.04 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Lead (Pb)	0.05 U	0.1 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001	0.0004	0.0001 U	0.0004	0.0001 U	0.0003
Thallium (Tl)	0.2 U	0.4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Leachable Volatiles (mg/L)								
1,1,1-Trichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Ethyl benzene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Vinyl chloride	NA	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U

B Detected in the blank
EQ BLANK Equipment Rinse Blank
FD BLANK Field Blank
J Estimated value
NA Not Analyzed
R Rejected value
U Not detected; value is method reporting limit
UB Detected in the blank and qualified as not detected

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 001s

Bore Number:	EQ BLANK	EQ BLANK	FD BLANK
Depth (inches):			
Sample Date:	11/9/95	11/9/95	11/13/95
WID Sample Numbers:	RA-95-205	RA-95-206	RA-95-270 RA-95-271
Analytes			
Leachable Metals (mg/L)			
Arsenic (As)	0.1 U	NA	0.1 U
Barium (Ba)	0.027	NA	0.051
Cadmium (Cd)	0.005 U	NA	0.005 UJ
Chromium (Cr)	0.02 U	NA	0.02 U
Lead (Pb)	0.05 U	NA	0.05 U
Mercury (Hg)	0.0001 U	NA	0.0001 U
Thallium (Tl)	0.2 U	NA	0.2 U
Leachable Volatiles (mg/L)			
1,1,1-Trichloroethane	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	0.05 U	0.05 U	0.05 U
Benzene	0.05 U	0.05 U	0.05 U
Chloroform	0.05 U	0.05 U	0.05 U
Ethyl benzene	0.05 U	0.05 U	0.05 U
Toluene	0.05 U	0.05 U	0.05 U
Vinyl chloride	0.1 U	0.1 U	0.1 U
Xylenes, total	0.05 U	0.05 U	0.05 U

B	Detected in the blank
EQ BLANK	Equipment Rinse Blank
FD BLANK	Field Blank
J	Estimated value
NA	Not Analyzed
R	Rejected value
U	Not detected; value is method reporting limit
UB	Detected in the blank and qualified as not detected

WIPP Soil Samples
Data Review Form

Statement of Purpose:

To review laboratory data packages for soil samples collected at SWMUs, evaluate data package completeness, and compare analytical quality control data to program objectives.

Section 1: Data Package Identification

P.O. Number: 500101 - Report 28449

No. Of Samples In Package: 64

Sample Collection Date: 11/6/95, 11/7/95, 11/9/95

Sample Receipt Date: 11/10/95

Sample Report Date: 11/29/95

Analytical Parameters: TCLP - VOCs, Alcohols, SVOCs, PCBs, and Metals

Sample Numbers in Data Package: RA-95-201 (P0328703), RA-95-202 (P0328704), RA-95-203 (P0328705), RA-95-204 (P0328706), RA-95-205A (P0328707), RA-95-205B (P0328708), RA-95-206 (P0328709), RA-95-207 (P0328710), RA-95-208 (P0328711), RA-95-209 (P0328712), RA-95-210 (P0328713), RA-95-211 (P0328714), RA-95-212 (P0328715), RA-95-213 (P0328716), RA-95-214 (P0328717), RA-95-215 (P0328718), RA-95-216 (P0328719), RA-95-217 (P0328720), RA-95-218 (P0328721), RA-95-219 (P0328722), RA-95-220 (P0328723), RA-95-221 (P0328724), RA-95-222 (P0328725), RA-95-223 (P0328726), RA-95-224 (P0328727), RA-95-225 (P0328728), RA-95-226 (P0328729), RA-95-227 (P0328730), RA-95-228 (P0328731), RA-95-229 (P0328732), RA-95-230 (P0328733), RA-95-231 (P0328734), RA-95-232 (P0328735), RA-95-233 (P0328736), RA-95-234 (P0328737), RA-95-235 (P0328738), RA-95-236 (P0328739), RA-95-237 (P0328740), RA-95-238 (P0328741), RA-95-239 (P0328742), RA-95-240 (P0328743), RA-95-241 (P0328744), RA-95-242 (P0328745), RA-95-243 (P0328746), RA-95-244 (P0328747), RA-95-245 (P0328748), RA-95-246 (P0328749), RA-95-247 (P0328750), RA-95-248 (P0328751), RA-95-249 (P0328752), RA-95-250 (P0328753), RA-95-251 (P0328754), RA-95-252 (P0328755), RA-95-253 (P0328756), RA-95-254 (P0328757), RA-95-255 (P0328758), RA-95-256 (P0328759), RA-95-257 (P0328760), RA-95-258 (P0328761), RA-95-259 (P0328762), RA-95-260 (P0328763), RA-95-261 (P0328764), RA-95-262 (P0328765), RA-95-263 (P0328766)

Data Reviewer: Donald K. Wambold

Date of Review: 1/17/96

Symbols used in the sections below are defined as follows:

X	Included: no problem	R	Resubmission
*	Included: problems noted	NR	Not Required
O	Not Included		

Section 2. Data Summary

Data for the above listed samples are:

_____ Acceptable for use
X Acceptable for use with qualifications noted
_____ Preliminary - pending action or verification
_____ Unacceptable for use
_____ To be reviewed by senior chemist

Reviewed by: _____ Date: _____

Section 3. Data Package Completeness Review

X	Chain of Custody/Request for Analysis
X	Laboratory Analysis Report
X[1]	Holding Times
X[2]	Method Reporting Limits
X	Dilution Factors
X[3]	Quality Control Report

Section 4. QC Review (from Laboratory Quality Control Report)

Volatiles

X	Method Blank
O[4]	Leachate Blank
X	Surrogate Standard Recovery
NR[5]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Alcohols

X	Method Blank
O[4]	Leachate Blank
X	Surrogate Standard Recovery
NR[5]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Semivolatiles

X	Method Blank
X	Leachate Blank
X	Surrogate Standard Recovery
O[6]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

PCBs

X	Method Blank
O[7]	Leachate Blank
X	Surrogate Standard Recovery
O[6]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Metals

X	Method Blank
*[8]	Leachate Blank
*[9]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Section 5. Calibration Data

Volatiles

X[10]	GC/MS Analysis Log
*[10,11]	GC/MS Initial Calibration Data
*[10,11,12]	GC/MS Continuing Calibration Data

Alcohols

X[10]	GC Analysis Log
X[10]	GC Initial Calibration Data
X[10]	GC Continuing Calibration Data

Semivolatiles

O[10,14]	GC/MS Analysis Log
X[10]	GC/MS Initial Calibration Data
X[10]	GC/MS Continuing Calibration Data

PCBs

O[10,14]	GC Analysis Log
*[10,13]	GC Initial Calibration Data
*[10,13]	GC Continuing Calibration Data

Metals

X[10]	ICP Analysis Log
X[10]	ICP Initial Calibration Data
O[10,14]	ICP Continuing Calibration Data
X[10]	CVAA Analysis Log
X[10]	CVAA Initial Calibration Data
X[10]	CVAA Continuing Calibration Data

Section 6. Comments

1. The holding times were exceeded for the analysis of alcohols in samples RA-95-223 and RA-95-237, and for the preparation of samples for semivolatile organic compounds and polychlorinated biphenyls (PCBs) in samples RA-95-227 and RA-95-238. Therefore, all analytical results for these analyses in the respective samples were qualified as estimated, J.

2. The method reporting limits (MRLs) and sample results were evaluated relative to the toxicity characteristic regulatory levels for analytes which have promulgated limits. No MRLs reported by the laboratory for these analytes were above the promulgated limits.

3. The information provided in the quality control (QC) summary was not complete for all reported samples and could not be directly referenced to the sample results and/or analysis logs. The "supplemental information" section of the quality control summary provides analytical and extraction batch numbers which can be referenced to the appropriate QC samples in the QC summary. The laboratory relies on these batch references, which are stored in the laboratory information management system (LIMS), to relate the appropriate QC data to sample batches, and does not typically include the batch numbers or internal laboratory QC sample numbers on the analysis logs. Therefore, QC sample results generally cannot be traced to the raw analytical data.

4. A leachate blank analysis was not provided for the TCLP volatiles and alcohols analyses in this package. Based on the laboratory's procedures, leachate blanks are performed once per twenty samples processed through the TCLP extraction procedure on each extraction apparatus. The leachate blank associated with the samples in this package may not be reported because it is reported in another package with the remaining samples in the extraction batch. There were no detections of volatile compounds or alcohols reported in the data package. Furthermore, no common volatile or alcohol laboratory contaminants, or other volatile organics, were reported in the method blanks. Therefore, the potential

for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

5. A matrix spike/matrix spike duplicate (MS/MSD) was not performed for the TCLP volatile and alcohols analyses due to limited sample volume produced during the TCLP extraction.

6. A MS/MSD was not performed for the TCLP semivolatiles and PCBs even though a separate sample preparation was performed following the TCLP extraction procedure. Because the MS/MSD was not performed, it was not possible to evaluate possible matrix effects on TCLP sample preparation and analysis for semivolatiles and PCBs.

7. A leachate blank analysis was not provided for the TCLP PCBs analyses in this package. Although leachate blank data was provided for the semivolatiles from the same TCLP extraction batch, an aliquot was not prepared or analyzed for PCBs. There were not any detections of PCBs reported for the samples or method blanks in this data package. Therefore, the potential for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

8. The laboratory provided results for metal leachate blanks from extraction batches 372 and 373, which were extracted one to three days prior to the WIPP samples reported in this data package, but were assumed to be representative of the extraction conditions for the WIPP samples. Because specific sample associations for each blank were not included, the highest results from the representative blanks were used to evaluate the WIPP sample results in the data package. Arsenic was detected at or above the MRL in the leachate blank samples. Arsenic results for samples RA-95-201, RA-95-202, RA-95-204, RA-95-207, RA-95-210, RA-95-213, RA-95-219, RA-95-222, RA-95-231, RA-95-235, RA-95-241, RA-95-253, and RA-95-259 were less than five times the blank concentration, and therefore were qualified as "UB" (not detected) due to blank contamination.

9. The MS/MSD recoveries for cadmium (50%/70%) were below the EPA Functional Guidelines minimum criteria of 75% for batch 38954. Therefore, the cadmium results for samples RA-95-257, RA-95-259, RA-95-261, and RA-95-263 from batch 38954 were qualified as estimated, J.

10. Representative calibration data provided with the data package were reviewed to evaluate the calibration procedures and protocols followed by the laboratory, and to assess the operating conditions of the instruments used for analysis of the samples in the data package. Specific items reviewed include: 1) analysis run logs, and initial and continuing calibration summaries for volatiles analyses of laboratory batches 38949, 38974, and 39016; 2) analysis run logs, and initial and continuing calibration summaries for alcohols analysis of laboratory batch 39014; 3) initial and continuing calibration summaries for semivolatiles analysis of laboratory batch 38912; 4) initial and continuing calibration summaries for PCBs analysis of laboratory batch 38911; 5) analysis run logs and initial calibration summaries for ICP metals analyses of laboratory batches 38885, 38953, and

38954; and 6) analysis run logs, and initial and continuing calibration data for CVAA mercury analyses of laboratory batches 38962 and 38963. WIPP sample results for volatiles, semivolatiles, and PCBs required qualification based on the representative calibration information that was provided in the data package (see sections below).

11. Cyclohexane was not included as a target analyte in the initial or continuing calibration standard analysis summaries, but was reported as an analyte for samples RA-95-211, RA-95-214, RA-95-217, RA-95-220, RA-95-223, RA-95-224, RA-95-229, RA-95-232, and RA-95-237. Because calibration of cyclohexane was not apparent in the data provided, but qualitative determinations could be made using the GC/MS system, the results for this analyte were qualified as estimated, J.

12. The continuing calibration percent differences (%D) reported for volatiles analysis of trichlorofluoromethane from laboratory analysis batch 38974, and trichlorofluoromethane, trichloroethene, 4-methyl-2-pentanone (methyl isobutyl ketone [MIBK]), and bromoform from laboratory batch 39016 exceeded the EPA Functional Guidelines maximum criteria of 25%. Therefore, the results for trichlorofluoromethane for samples RA-95-211, RA-95-214, RA-95-217, RA-95-220, RA-95-223, RA-95-224, and RA-95-237 (from batch 38974), and the results for trichlorofluoromethane, trichloroethene, 4-methyl-2-pentanone (methyl isobutyl ketone [MIBK]), and bromoform for samples RA-95-229 and RA-95-232 (from batch 39016), were qualified as estimated, J.

13. The initial and continuing calibrations for the PCBs analysis did not incorporate standards for each of the PCBs that were being analyzed. The calibrations only included standards for PCB-1242 and PCB-1260. The remaining PCBs exhibit responses that are similar enough to the two standards that it would be possible to determine if these analytes were present in the samples. However, because accurate qualitative identification and quantitative measurement techniques were not demonstrated for instrument responses for PCB-1221, PCB-1232, PCB-1016, PCB-1248, and PCB-1254, the results for these analytes in samples RA-95-209, RA-95-212, RA-95-215, RA-95-218, RA-95-221, RA-95-225, RA-95-227, RA-95-230, RA-95-233, and RA-95-238 were qualified as estimated, J.

14. The following specific items were not included by the laboratory, and could not be evaluated for potential effects on the reported sample results: 1) analysis run logs for semivolatiles analysis of laboratory batch 38912; 2) analysis run logs for PCBs analysis of laboratory batch 38911 (reported from the run on 11/4/95); and 3) continuing calibration data for ICP metals analyses of laboratory batches 38885, 38953, and 38954.

Signatures below constitutes validation of this record.

Validator:		
Donald K. Wambold	Donald K. Wambold	1/19/96
Printed Name	Signature	Date
QA/QC Reviewer:		
MARK R. COLSMAN	Mark R. Colsman	1/26/96
Printed Name	Signature	Date

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-201 TCLP
NUS SAMPLE NO: P0328703
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		1	
		Final Leachate pH		5.9	
3	AASL	Arsenic, Leachable (As)	1	0.2	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.66	mg/L
6	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:
6 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED
Reviewed By [signature]
Date 1/19/96

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ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-202 TCLP
NUS SAMPLE NO: P0328704
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		1	
		Final Leachate pH		5.4	
3	AASL	Arsenic, Leachable (As)	1	0.2	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.54	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By [signature]
Date 1/19/96

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November 29, 1995
Report No.: 00028449

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CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-203 TCLP
NUS SAMPLE NO: P0328705
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449
Section A Page 4

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-204 TCLP
NUS SAMPLE NO: P0328706
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		1	
		Final Leachate pH		5.1	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.59	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-205A TCLP
NUS SAMPLE NO: P0328707
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(0900)
		End Date/Time		11/16(0900)

COMMENTS:
20 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By [signature]
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-205B TCLP
NUS SAMPLE NO: P0328708
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		6.8
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.027 mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

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Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-206 TCLP
NUS SAMPLE NO: P0328709
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS
CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

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November 29, 1995
Report No.: 00028449
Section A Page 8

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-207 TCLP
NUS SAMPLE NO: P0328710
P.O. NO.: 500101

DATE SAMPLED: 09-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		11/14(1230)		
		End Date/Time		11/15(0730)		
		Extraction Fluid		1		
		Final Leachate pH		5.0		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.53	mg/L	
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED
Reviewed By [signature]
Date 11/9/96

WIPP Soil Samples
Data Review Form

Statement of Purpose:

To review laboratory data packages for soil samples collected at SWMUs, evaluate data package completeness, and compare analytical quality control data to program objectives.

Section 1: Data Package Identification

P.O. Number: 500101 - Report 28502 No. Of Samples In Package: 8
Sample Collection Date: 11/13/95 Sample Receipt Date: 11/14/95
Sample Report Date: 12/01/95 Analytical Parameters: TCLP - VOCs, Metals
Sample Numbers in Data Package: RA-95-264 (P0328912), RA-95-265 (P0328913), RA-95-266 (P0328914), RA-95-267 (P0328915), RA-95-268 (P0328916), RA-95-269 (P0328917), RA-95-270 (P0328918), RA-95-271 (P0328919)

Data Reviewer: Donald K. Wambold Date of Review: 1/11/96

Symbols used in the sections below are defined as follows:

X	Included: no problem	R	Resubmission
*	Included: problems noted	NR	Not Required
O	Not Included		

Section 2. Data Summary

Data for the above listed samples are:

	Acceptable for use
X	Acceptable for use with qualifications noted
	Preliminary - pending action or verification
	Unacceptable for use
X	To be reviewed by senior chemist

Reviewed by: Mark R. Gleman Date: 1/23/96
- See note 8a

Section 3. Data Package Completeness Review

X Chain of Custody/Request for Analysis
X Laboratory Analysis Report
X Holding Times
X[1] Method Reporting Limits
X Dilution Factors
X[2] Quality Control Report

Section 4. QC Review (from Laboratory Quality Control Report)

Volatiles

X Method Blank
O[3] Leachate Blank
X Surrogate Standard Recovery
NR[4] Matrix Spike/Matrix Spike Duplicate Samples
X Laboratory Control Sample
NR Duplicate Sample

Metals

X Method Blank
*[5] Leachate Blank
O[6] Matrix Spike/Matrix Spike Duplicate Samples
X Laboratory Control Sample
NR Duplicate Sample

Section 5. Calibration Data

Volatiles

O[7,8] GC/MS Analysis Log
O[7,8] GC/MS Initial Calibration Data
O[7,8] GC/MS Continuing Calibration Data

Metals

X[7] ICP Analysis Log
X[7] ICP Initial Calibration Data
(*) ~~RO~~[7,8] ICP Continuing Calibration Data
X[7] CVAA Analysis Log
X[7] CVAA Initial Calibration Data
X[7] CVAA Continuing Calibration Data

(*) MRC, 1/23/96; See note 8a.

Section 6. Comments

1. The method reporting limits (MRLs) and sample results for 1,1,1-trichloroethane, ethyl benzene, chloroform, total xylenes, and thallium were not evaluated relative to the toxicity characteristic regulatory levels because limits have not been promulgated for these analytes.

2. The information provided in the quality control (QC) summary was not complete for all reported samples and could not be directly referenced to the sample results and/or analysis logs. The "supplemental information" section of the quality control summary provides analytical and extraction batch numbers which can be referenced to the appropriate QC samples in the QC summary. The laboratory relies on these batch references, which are stored in the laboratory information management system (LIMS), to relate the appropriate QC data to sample batches, and does not typically include the batch numbers or internal laboratory QC sample numbers on the analysis logs. Therefore, QC sample results generally cannot be traced to the raw analytical data.

3. A leachate blank analysis was not provided for the TCLP volatiles analyses in this package. Based on the laboratory's procedures, leachate blanks are performed once per twenty samples processed through the TCLP extraction procedure on each extraction apparatus. The leachate blank associated with the samples in this package may not be reported because it is reported in another package with the remaining samples in the extraction batch. There were not any detections of volatile compounds reported in the data package, and no common volatile laboratory contaminants or other volatile compounds were reported in the method blanks. Therefore, the potential for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

4. A matrix spike/matrix spike duplicate was not performed for the TCLP volatile analyses due to limited sample volume produced during the TCLP extraction.

5. The laboratory provided metal leachate blank sample results for extraction batches 372 and 373 which were considered representative of the extraction conditions for the WIPP samples in this data package. Specific sample associations for the blank was not included, therefore the highest results from the representative blanks were used to evaluate the WIPP sample results from the TCLP extraction batch in the case. (Note: the blanks provided were from a different TCLP extraction batch, performed three days prior to the TCLP extraction of the samples in this case.) Arsenic was detected at or above the MRL in the leachate blank samples. The arsenic result for sample RA-95-265 was less than five times the blank concentration, and therefore was qualified as "UB" (not detected) due to blank contamination.

6. The MS/MSD recoveries for cadmium (50%/70%) were below the minimum limit of 75% for batch 38954. Therefore, the cadmium results for samples RA-95-264, RA-95-265, RA-95-267, RA-95-269, and RA-95-271 from batch 38954 were qualified as estimated, J.

7. Representative calibration data provided with the data package were reviewed to evaluate the calibration procedures and protocols followed by the laboratory, and to assess the operating conditions of the instruments used for analysis of the samples in the data package. Specific items reviewed include: 1) analysis run logs and initial calibration data for ICP metals analyses of laboratory batch 38954; and 2) analysis run logs, and initial and continuing calibration data for CVAA mercury analyses of laboratory batches 39081 and 39083. WIPP sample results did not require qualification based on the representative calibration information that was provided in the data package.

8. The following specific items were not included by the laboratory, and could not be evaluated for potential effects on the reported sample results: 1) analysis run logs, and initial and continuing calibration data for volatiles analyses of laboratory batch 39016 (samples RA-95-266, RA-95-268, and RA-95-270); and 2) continuing calibration data for ICP metals analyses of laboratory batch 38954 (samples RA-95-264, RA-95-265, RA-95-267, RA-95-269, and RA-95-271).

8a. Additional initial and continuing calibration data for ICP metals and CVAA mercury analyses were provided by the laboratory for the sample batches in this data package. WIPP sample results did not require qualification based on review of the additional calibration data provided. Although no additional calibration data was provided for volatiles analyses, review of laboratory QC check results (i.e., surrogate recoveries, lab control samples, and method blanks) indicate that the volatiles method was in control. Therefore, no qualifiers were added to the volatiles results based on the missing calibration data.

MRC, 1/23/96

Signatures below constitutes validation of this record.

Validator: Donald K. Wambolt	Donald K. Wambolt	1/11/96
Printed Name	Signature	Date
QA/QC Reviewer: MARK R. COLEMAN	Mark R. Coleman	1/23/96
Printed Name	Signature	Date

Halliburton NUS CORPORATION

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5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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December 01, 1995
Report No.: 00028502

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-264 TCLP
NUS SAMPLE NO: P0328912
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/16(1400)
		End Date/Time		11/17(0630)
		Extraction Fluid		2
		Final Leachate pH		5.8
3	AASL	Arsenic, Leachable (As)	2	< 0.2 mg/L
4	ABAL	Barium, Leachable (Ba)	2	0.71 mg/L
5	ACDL	Cadmium, Leachable (Cd)	3	< 0.02 mg/L J
6	ACRL	Chromium, Leachable (Cr)	2	< 0.04 mg/L
7	APBL	Lead, Leachable (Pb)	2	< 0.1 mg/L
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
9	ATLL	Thallium, Leachable (Tl)	2	< 0.4 mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

5 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

9 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By [signature]

Date 1/11/96

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December 01, 1995
Report No.: 00028502

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-265 TCLP
NUS SAMPLE NO: P0328913
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/16(1400)
		End Date/Time		11/17(0630)
		Extraction Fluid		1
		Final Leachate pH		6.3
3	AASL	Arsenic, Leachable (As)	1	0.1 mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.64 mg/L
5	ACDL	Cadmium, Leachable (Cd)	2	< 0.01 mg/L J
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0004 mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
5 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED
Reviewed By [signature]
Date 1/11/96

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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-266 ZHE
NUS SAMPLE NO: P0328914
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/20(1250)
		End Date/Time		11/21(0700)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/11/96

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December 01, 1995
Report No.: 00028502
Section A Page 4

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-267 TCLP
NUS SAMPLE NO: P0328915
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/16(1400)	
		End Date/Time		11/17(0630)	
		Extraction Fluid		1	
		Final Leachate pH		6.2	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.60	mg/L
5	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L 5
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0004	mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:
5 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED
Reviewed By [signature]
Date 1/11/96

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December 01, 1995
Report No.: 00028502
Section A Page 5

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-268 ZHE
NUS SAMPLE NO: P0328916
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/20(1250)
		End Date/Time		11/21(0700)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/11/96

Halliburton NUS CORPORATION

NUS LABORATORY
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Pittsburgh, Pennsylvania 15205

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December 01, 1995
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CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-269 TCLP
NUS SAMPLE NO: P0328917
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/16(1400)
		End Date/Time		11/17(0630)
		Extraction Fluid		1
		Final Leachate pH		6.3
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.66 mg/L
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L J
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
8	AHGL	Mercury, Leachable (Hg)	1	0.0003 mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/11/96

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December 01, 1995
Report No.: 00028502

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ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-270 ZHE
NUS SAMPLE NO: P0328918
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/20(1000)
		End Date/Time		11/20(1000)
10	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		toluene	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/11/96

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December 01, 1995
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ADDRESS: P.O. BOX 2078
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ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-271 TCLP
NUS SAMPLE NO: P0328919
P.O. NO.: 500101

DATE SAMPLED: 13-NOV-95
DATE RECEIVED: 14-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		6.0
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.051 mg/L
5	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L J
6	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
7	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
8	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
9	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/11/96

APPENDIX 5

Results of Voluntary Release Assessment Samples Collected at SWMU 003a

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	36-48	12-24	36-48	12-24	36-48	12-24	36-48
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-209	RA-95-211	RA-95-214	RA-95-217	RA-95-220	RA-95-224	RA-95-229	RA-95-232
	RA-95-210	RA-95-212	RA-95-215	RA-95-218	RA-95-221	RA-95-225	RA-95-230	RA-95-233
		RA-95-213	RA-95-216	RA-95-219	RA-95-222	RA-95-226	RA-95-231	RA-95-234
Analytes								
Leachable Metals (mg/L)								
Arsenic (As)	0.1 UB	0.1 UB	0.5 U	0.1 UB	0.1 UB	0.1 U	0.1 UB	0.1 U
Barium (Ba)	0.72	0.75	1.7	0.48	0.61	0.35	0.85	0.73
Cadmium (Cd)	0.01 U	0.01 U	0.02 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chromium (Cr)	0.02 U	0.02 U	0.1 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.2 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Nickel (Ni)	0.02 U	0.02 U	0.1 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Selenium (Se)	0.1 U	0.1 U	0.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Silver (Ag)	0.01 U	0.01 U	0.05 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Thallium (Tl)	0.2 U	0.2 U	1 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Leachable Volatiles (mg/L)								
1,1,1-Trichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Butanone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Acetone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Carbon tetrachloride	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chlorobenzene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroform	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	36-48	12-24	36-48	12-24	36-48	12-24	36-48
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-209	RA-95-211	RA-95-214	RA-95-217	RA-95-220	RA-95-224	RA-95-229	RA-95-232
	RA-95-210	RA-95-212	RA-95-215	RA-95-218	RA-95-221	RA-95-225	RA-95-230	RA-95-233
		RA-95-213	RA-95-216	RA-95-219	RA-95-222	RA-95-226	RA-95-231	RA-95-234
Analytes								
Leachable Volatiles (mg/L)								
cis-1,2-Dichloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Cyclohexane	NA	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Cyclohexanone	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethyl acetate	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Ethyl benzene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toluene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Tetrachloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Tribromomethane	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 UJ
Trichloroethene	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 UJ
Trichloroflouromethane	NA	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Vinyl chloride	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Xylenes, total	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Ethoxyethanol	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Isobutanol	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methanol	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
n-Butanol	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Leachable Semivolatiles (mg/L)								
1,2-Dichlorobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1,4-Dichlorobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4,5-Trichlorophenol	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4,6-Trichlorophenol	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,4-Dinitrotoluene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2-Methylphenol	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
3/4-Methylphenol	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #1	BORE #1	BORE #2	BORE #2	BORE #3	BORE #3	BORE #4	BORE #4
Depth (inches):	12-24	36-48	12-24	36-48	12-24	36-48	12-24	36-48
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-209	RA-95-211	RA-95-214	RA-95-217	RA-95-220	RA-95-224	RA-95-229	RA-95-232
	RA-95-210	RA-95-212	RA-95-215	RA-95-218	RA-95-221	RA-95-225	RA-95-230	RA-95-233
		RA-95-213	RA-95-216	RA-95-219	RA-95-222	RA-95-226	RA-95-231	RA-95-234
Analytes								
Leachable Semivolatiles (mg/L)								
Hexachlorobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachlorobutadiene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexachloroethane	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nitrobenzene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Pentachlorophenol	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Pyridine	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Leachable PCBs (μg/L)								
PCB-1221	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1232	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1242/1016	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1248	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1254	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
PCB-1260	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

B	Detected in the blank
EQ BLANK	Equipment Rinse Blank
FD BLANK	Field Blank
J	Estimated value
NA	Not Analyzed
PCB	Polychlorinated biphenyls
R	Rejected value
U	Not detected; value is method reporting limit
UB	Detected in the blank and qualified as not detected

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #5	BORE #5	EQ BLANK	FD BLANK
Depth (inches):	12-24	36-48		
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-235	RA-95-236	RA-95-223	RA-95-237
			RA-95-227	RA-95-238
			RA-95-228	RA-95-239
Analytes				
Leachable Metals (mg/L)				
Arsenic (As)	0.1 UB	0.1 U	0.1 U	0.1 U
Barium (Ba)	0.43	0.43	0.036	0.037
Cadmium (Cd)	0.005 U	0.005 U	0.005 U	0.005 U
Chromium (Cr)	0.02 U	0.02 U	0.02 U	0.02 U
Lead (Pb)	0.05 U	0.05 U	0.05 U	0.05 U
Mercury (Hg)	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Nickel (Ni)	0.02 U	0.02 U	0.02 U	0.02 U
Selenium (Se)	0.1 U	0.1 U	0.1 U	0.1 U
Silver (Ag)	0.01 U	0.01 U	0.01 U	0.01 U
Thallium (Tl)	0.2 U	0.2 U	0.2 U	0.2 U
Leachable Volatiles (mg/L)				
1,1,1-Trichloroethane	NA	NA	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	NA	NA	0.05 U	0.05 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	NA	0.05 U	0.05 U
1,1,2-Trichloroethane	NA	NA	0.05 U	0.05 U
1,1-Dichloroethane	NA	NA	0.05 U	0.05 U
1,1-Dichloroethene	NA	NA	0.05 U	0.05 U
1,2-Dichloroethane	NA	NA	0.05 U	0.05 U
2-Butanone	NA	NA	0.5 U	0.5 U
4-Methyl-2-pentanone	NA	NA	0.5 U	0.5 U
Acetone	NA	NA	0.5 U	0.5 U
Benzene	NA	NA	0.05 U	0.05 U
Carbon tetrachloride	NA	NA	0.05 U	0.05 U
Chlorobenzene	NA	NA	0.05 U	0.05 U
Chloroform	NA	NA	0.05 U	0.05 U

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #5	BORE #5	EQ BLANK	FD BLANK
Depth (inches):	12-24	36-48		
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-235	RA-95-236	RA-95-223	RA-95-237
			RA-95-227	RA-95-238
			RA-95-228	RA-95-239
Analytes				
Leachable Volatiles (mg/L)				
cis-1,2-Dichloroethene	NA	NA	0.05 U	0.05 U
Cyclohexane	NA	NA	0.1 UJ	0.1 UJ
Cyclohexanone	NA	NA	0.5 U	0.5 U
Ethyl acetate	NA	NA	0.1 U	0.1 U
Ethyl benzene	NA	NA	0.05 U	0.05 U
Toluene	NA	NA	0.05 U	0.05 U
Methylene chloride	NA	NA	0.05 U	0.05 U
Tetrachloroethene	NA	NA	0.05 U	0.05 U
Tribromomethane	NA	NA	0.05 U	0.05 U
Trichloroethene	NA	NA	0.05 U	0.05 U
Trichloroflouromethane	NA	NA	0.1 UJ	0.1 UJ
Vinyl chloride	NA	NA	0.1 U	0.1 U
Xylenes, total	NA	NA	0.05 U	0.05 U
2-Ethoxyethanol	NA	NA	50 UJ	50 UJ
Isobutanol	NA	NA	10 UJ	10 UJ
Methanol	NA	NA	10 UJ	10 UJ
n-Butanol	NA	NA	10 UJ	10 UJ
Leachable Semivolatiles (mg/L)				
1,2-Dichlorobenzene	NA	NA	0.1 UJ	0.1 UJ
1,4-Dichlorobenzene	NA	NA	0.1 UJ	0.1 UJ
2,4,5-Trichlorophenol	NA	NA	0.5 UJ	0.5 UJ
2,4,6-Trichlorophenol	NA	NA	0.1 UJ	0.1 UJ
2,4-Dinitrotoluene	NA	NA	0.1 UJ	0.1 UJ
2-Methylphenol	NA	NA	0.1 UJ	0.1 UJ
3/4-Methylphenol	NA	NA	0.1 UJ	0.1 UJ

Soil TCLP Analytical Results
Voluntary Release Assessment
SWMU # 003a

Bore Number:	BORE #5	BORE #5	EQ BLANK	FD BLANK
Depth (inches):	12-24	36-48		
Sample Date:	11/6/95	11/6/95	11/6/95	11/6/95
WID Sample Numbers:	RA-95-235	RA-95-236	RA-95-223	RA-95-237
			RA-95-227	RA-95-238
			RA-95-228	RA-95-239
Analytes				
Leachable Semivolatiles (mg/L)				
Hexachlorobenzene	NA	NA	0.1 UJ	0.1 UJ
Hexachlorobutadiene	NA	NA	0.1 UJ	0.1 UJ
Hexachloroethane	NA	NA	0.1 UJ	0.1 UJ
Nitrobenzene	NA	NA	0.1 UJ	0.1 UJ
Pentachlorophenol	NA	NA	0.5 UJ	0.5 UJ
Pyridine	NA	NA	0.1 UJ	0.1 UJ
Leachable PCBs (µg/L)				
PCB-1221	NA	NA	0.5 UJ	0.5 UJ
PCB-1232	NA	NA	0.5 UJ	0.5 UJ
PCB-1242/1016	NA	NA	0.5 UJ	0.5 UJ
PCB-1248	NA	NA	0.5 UJ	0.5 UJ
PCB-1254	NA	NA	0.5 UJ	0.5 UJ
PCB-1260	NA	NA	0.5 UJ	0.5 UJ

B	Detected in the blank
EQ BLANK	Equipment Rinse Blank
FD BLANK	Field Blank
J	Estimated value
NA	Not Analyzed
PCB	Polychlorinated biphenyls
R	Rejected value
U	Not detected; value is method reporting limit
UB	Detected in the blank and qualified as not detected

WIPP Soil Samples
Data Review Form

Statement of Purpose:

To review laboratory data packages for soil samples collected at SWMUs, evaluate data package completeness, and compare analytical quality control data to program objectives.

Section 1: Data Package Identification

P.O. Number: 500101 - Report 28449

No. Of Samples In Package: 64

Sample Collection Date: 11/6/95, 11/7/95, 11/9/95

Sample Receipt Date: 11/10/95

Sample Report Date: 11/29/95

Analytical Parameters: TCLP - VOCs, Alcohols, SVOCs, PCBs, and Metals

Sample Numbers in Data Package: RA-95-201 (P0328703), RA-95-202 (P0328704), RA-95-203 (P0328705), RA-95-204 (P0328706), RA-95-205A (P0328707), RA-95-205B (P0328708), RA-95-206 (P0328709), RA-95-207 (P0328710), RA-95-208 (P0328711), RA-95-209 (P0328712), RA-95-210 (P0328713), RA-95-211 (P0328714), RA-95-212 (P0328715), RA-95-213 (P0328716), RA-95-214 (P0328717), RA-95-215 (P0328718), RA-95-216 (P0328719), RA-95-217 (P0328720), RA-95-218 (P0328721), RA-95-219 (P0328722), RA-95-220 (P0328723), RA-95-221 (P0328724), RA-95-222 (P0328725), RA-95-223 (P0328726), RA-95-224 (P0328727), RA-95-225 (P0328728), RA-95-226 (P0328729), RA-95-227 (P0328730), RA-95-228 (P0328731), RA-95-229 (P0328732), RA-95-230 (P0328733), RA-95-231 (P0328734), RA-95-232 (P0328735), RA-95-233 (P0328736), RA-95-234 (P0328737), RA-95-235 (P0328738), RA-95-236 (P0328739), RA-95-237 (P0328740), RA-95-238 (P0328741), RA-95-239 (P0328742), RA-95-240 (P0328743), RA-95-241 (P0328744), RA-95-242 (P0328745), RA-95-243 (P0328746), RA-95-244 (P0328747), RA-95-245 (P0328748), RA-95-246 (P0328749), RA-95-247 (P0328750), RA-95-248 (P0328751), RA-95-249 (P0328752), RA-95-250 (P0328753), RA-95-251 (P0328754), RA-95-252 (P0328755), RA-95-253 (P0328756), RA-95-254 (P0328757), RA-95-255 (P0328758), RA-95-256 (P0328759), RA-95-257 (P0328760), RA-95-258 (P0328761), RA-95-259 (P0328762), RA-95-260 (P0328763), RA-95-261 (P0328764), RA-95-262 (P0328765), RA-95-263 (P0328766)

Data Reviewer: Donald K. Wambold

Date of Review: 1/17/96

Symbols used in the sections below are defined as follows:

X	Included: no problem	R	Resubmission
*	Included: problems noted	NR	Not Required
O	Not Included		

Section 2. Data Summary

Data for the above listed samples are:

	Acceptable for use
X	Acceptable for use with qualifications noted
	Preliminary - pending action or verification
	Unacceptable for use
	To be reviewed by senior chemist

Reviewed by: _____ Date: _____

Section 3. Data Package Completeness Review

X	Chain of Custody/Request for Analysis
X	Laboratory Analysis Report
X[1]	Holding Times
X[2]	Method Reporting Limits
X	Dilution Factors
X[3]	Quality Control Report

Section 4. QC Review (from Laboratory Quality Control Report)

Volatiles

X	Method Blank
O[4]	Leachate Blank
X	Surrogate Standard Recovery
NR[5]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Alcohols

X	Method Blank
O[4]	Leachate Blank
X	Surrogate Standard Recovery
NR[5]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Semivolatiles

X	Method Blank
X	Leachate Blank
X	Surrogate Standard Recovery
O[6]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

PCBs

X	Method Blank
O[7]	Leachate Blank
X	Surrogate Standard Recovery
O[6]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Metals

X	Method Blank
*[8]	Leachate Blank
*[9]	Matrix Spike/Matrix Spike Duplicate Samples
X	Laboratory Control Sample
NR	Duplicate Sample

Section 5. Calibration Data

Volatiles

X[10]	GC/MS Analysis Log
*[10,11]	GC/MS Initial Calibration Data
*[10,11,12]	GC/MS Continuing Calibration Data

Alcohols

X[10]	GC Analysis Log
X[10]	GC Initial Calibration Data
X[10]	GC Continuing Calibration Data

Semivolatiles

O[10,14]	GC/MS Analysis Log
X[10]	GC/MS Initial Calibration Data
X[10]	GC/MS Continuing Calibration Data

PCBs

O[10,14]	GC Analysis Log
*[10,13]	GC Initial Calibration Data
*[10,13]	GC Continuing Calibration Data

Metals

X[10]	ICP Analysis Log
X[10]	ICP Initial Calibration Data
O[10,14]	ICP Continuing Calibration Data
X[10]	CVAA Analysis Log
X[10]	CVAA Initial Calibration Data
X[10]	CVAA Continuing Calibration Data

Section 6. Comments

1. The holding times were exceeded for the analysis of alcohols in samples RA-95-223 and RA-95-237, and for the preparation of samples for semivolatile organic compounds and polychlorinated biphenyls (PCBs) in samples RA-95-227 and RA-95-238. Therefore, all analytical results for these analyses in the respective samples were qualified as estimated, J.

2. The method reporting limits (MRLs) and sample results were evaluated relative to the toxicity characteristic regulatory levels for analytes which have promulgated limits. No MRLs reported by the laboratory for these analytes were above the promulgated limits.

3. The information provided in the quality control (QC) summary was not complete for all reported samples and could not be directly referenced to the sample results and/or analysis logs. The "supplemental information" section of the quality control summary provides analytical and extraction batch numbers which can be referenced to the appropriate QC samples in the QC summary. The laboratory relies on these batch references, which are stored in the laboratory information management system (LIMS), to relate the appropriate QC data to sample batches, and does not typically include the batch numbers or internal laboratory QC sample numbers on the analysis logs. Therefore, QC sample results generally cannot be traced to the raw analytical data.

4. A leachate blank analysis was not provided for the TCLP volatiles and alcohols analyses in this package. Based on the laboratory's procedures, leachate blanks are performed once per twenty samples processed through the TCLP extraction procedure on each extraction apparatus. The leachate blank associated with the samples in this package may not be reported because it is reported in another package with the remaining samples in the extraction batch. There were no detections of volatile compounds or alcohols reported in the data package. Furthermore, no common volatile or alcohol laboratory contaminants, or other volatile organics, were reported in the method blanks. Therefore, the potential

for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

5. A matrix spike/matrix spike duplicate (MS/MSD) was not performed for the TCLP volatile and alcohols analyses due to limited sample volume produced during the TCLP extraction.

6. A MS/MSD was not performed for the TCLP semivolatiles and PCBs even though a separate sample preparation was performed following the TCLP extraction procedure. Because the MS/MSD was not performed, it was not possible to evaluate possible matrix effects on TCLP sample preparation and analysis for semivolatiles and PCBs.

7. A leachate blank analysis was not provided for the TCLP PCBs analyses in this package. Although leachate blank data was provided for the semivolatiles from the same TCLP extraction batch, an aliquot was not prepared or analyzed for PCBs. There were not any detections of PCBs reported for the samples or method blanks in this data package. Therefore, the potential for laboratory cross contamination of samples appeared to be low, and sample results were not qualified.

8. The laboratory provided results for metal leachate blanks from extraction batches 372 and 373, which were extracted one to three days prior to the WIPP samples reported in this data package, but were assumed to be representative of the extraction conditions for the WIPP samples. Because specific sample associations for each blank were not included, the highest results from the representative blanks were used to evaluate the WIPP sample results in the data package. Arsenic was detected at or above the MRL in the leachate blank samples. Arsenic results for samples RA-95-201, RA-95-202, RA-95-204, RA-95-207, RA-95-210, RA-95-213, RA-95-219, RA-95-222, RA-95-231, RA-95-235, RA-95-241, RA-95-253, and RA-95-259 were less than five times the blank concentration, and therefore were qualified as "UB" (not detected) due to blank contamination.

9. The MS/MSD recoveries for cadmium (50%/70%) were below the EPA Functional Guidelines minimum criteria of 75% for batch 38954. Therefore, the cadmium results for samples RA-95-257, RA-95-259, RA-95-261, and RA-95-263 from batch 38954 were qualified as estimated, J.

10. Representative calibration data provided with the data package were reviewed to evaluate the calibration procedures and protocols followed by the laboratory, and to assess the operating conditions of the instruments used for analysis of the samples in the data package. Specific items reviewed include: 1) analysis run logs, and initial and continuing calibration summaries for volatiles analyses of laboratory batches 38949, 38974, and 39016; 2) analysis run logs, and initial and continuing calibration summaries for alcohols analysis of laboratory batch 39014; 3) initial and continuing calibration summaries for semivolatiles analysis of laboratory batch 38912; 4) initial and continuing calibration summaries for PCBs analysis of laboratory batch 38911; 5) analysis run logs and initial calibration summaries for ICP metals analyses of laboratory batches 38885, 38953, and

38954; and 6) analysis run logs, and initial and continuing calibration data for CVAA mercury analyses of laboratory batches 38962 and 38963. WIPP sample results for volatiles, semivolatiles, and PCBs required qualification based on the representative calibration information that was provided in the data package (see sections below).

11. Cyclohexane was not included as a target analyte in the initial or continuing calibration standard analysis summaries, but was reported as an analyte for samples RA-95-211, RA-95-214, RA-95-217, RA-95-220, RA-95-223, RA-95-224, RA-95-229, RA-95-232, and RA-95-237. Because calibration of cyclohexane was not apparent in the data provided, but qualitative determinations could be made using the GC/MS system, the results for this analyte were qualified as estimated, J.

12. The continuing calibration percent differences (%D) reported for volatiles analysis of trichlorofluoromethane from laboratory analysis batch 38974, and trichlorofluoromethane, trichloroethene, 4-methyl-2-pentanone (methyl isobutyl ketone [MIBK]), and bromoform from laboratory batch 39016 exceeded the EPA Functional Guidelines maximum criteria of 25%. Therefore, the results for trichlorofluoromethane for samples RA-95-211, RA-95-214, RA-95-217, RA-95-220, RA-95-223, RA-95-224, and RA-95-237 (from batch 38974), and the results for trichlorofluoromethane, trichloroethene, 4-methyl-2-pentanone (methyl isobutyl ketone [MIBK]), and bromoform for samples RA-95-229 and RA-95-232 (from batch 39016), were qualified as estimated, J.

13. The initial and continuing calibrations for the PCBs analysis did not incorporate standards for each of the PCBs that were being analyzed. The calibrations only included standards for PCB-1242 and PCB-1260. The remaining PCBs exhibit responses that are similar enough to the two standards that it would be possible to determine if these analytes were present in the samples. However, because accurate qualitative identification and quantitative measurement techniques were not demonstrated for instrument responses for PCB-1221, PCB-1232, PCB-1016, PCB-1248, and PCB-1254, the results for these analytes in samples RA-95-209, RA-95-212, RA-95-215, RA-95-218, RA-95-221, RA-95-225, RA-95-227, RA-95-230, RA-95-233, and RA-95-238 were qualified as estimated, J.

14. The following specific items were not included by the laboratory, and could not be evaluated for potential effects on the reported sample results: 1) analysis run logs for semivolatiles analysis of laboratory batch 38912; 2) analysis run logs for PCBs analysis of laboratory batch 38911 (reported from the run on 11/4/95); and 3) continuing calibration data for ICP metals analyses of laboratory batches 38885, 38953, and 38954.

Signatures below constitutes validation of this record.

Validator: Donald K. Wambold	Donald K. Wambold	1/19/96
Printed Name	Signature	Date
QA/QC Reviewer: MARK R. COLSMAN	Mark R. Colsman	1/26/96
Printed Name	Signature	Date

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-208 TCLP
NUS SAMPLE NO: P0328711
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		benzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 11/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-209 TCLP
NUS SAMPLE NO: P0328712
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/14(1230)
		End Date/Time		11/15(0730)
		Extraction Fluid		1
		Final Leachate pH		6.3
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L J
		PCB-1232	1	< 0.5 ug/L J
		PCB-1242/1016	1	< 0.5 ug/L J
		PCB-1248	1	< 0.5 ug/L J
		PCB-1254	1	< 0.5 ug/L J
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-210 TCLP
NUS SAMPLE NO: P0328713
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		1	
		Final Leachate pH		6.3	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.72	mg/L
6	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:
6 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449
Section A Page 12

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-211 TCLP
NUS SAMPLE NO: P0328714
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-211 TCLP
NUS SAMPLE NO: P0328714

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-212 TCLP
NUS SAMPLE NO: P0328715
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/14(1230)
		End Date/Time		11/15(0730)
		Extraction Fluid		1
		Final Leachate pH		5.7
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L J
		PCB-1232	1	< 0.5 ug/L J
		PCB-1242/1016	1	< 0.5 ug/L J
		PCB-1248	1	< 0.5 ug/L J
		PCB-1254	1	< 0.5 ug/L J
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]
Date 1/9/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-213 TCLP
NUS SAMPLE NO: P0328716
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		1	
		Final Leachate pH		5.9	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.75	mg/L
6	ACDL	Cadmium, Leachable (Cd)	2	< 0.01	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:
6 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED
Reviewed By [signature]
Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-214 TCLP
NUS SAMPLE NO: P0328717
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-214 TCLP
NUS SAMPLE NO: P0328717

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 11/9/96

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November 29, 1995
Report No.: 00028449
Section A Page 18

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-215 TCLP
NUS SAMPLE NO: P0328718
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP			
		PCB-1221	1	< 0.5	ug/L
		PCB-1232	1	< 0.5	ug/L
		PCB-1242/1016	1	< 0.5	ug/L
		PCB-1248	1	< 0.5	ug/L
		PCB-1254	1	< 0.5	ug/L
		PCB-1260	1	< 0.5	ug/L
16	OTCLP	SEMIVOLATILES - TCLP			
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1	mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1	mg/L
		2,4,5-trichlorophenol	10	< 0.5	mg/L
		2,4,6-trichlorophenol	10	< 0.1	mg/L
		2,4-dinitrotoluene	10	< 0.1	mg/L
		2-methylphenol [o-cresol]	10	< 0.1	mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1	mg/L
		hexachlorobenzene	10	< 0.1	mg/L
		hexachlorobutadiene	10	< 0.1	mg/L
		hexachloroethane	10	< 0.1	mg/L
		nitrobenzene	10	< 0.1	mg/L
		pentachlorophenol	10	< 0.5	mg/L
		pyridine	10	< 0.1	mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-216 TCLP
NUS SAMPLE NO: P0328719
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/14(1230)	
		End Date/Time		11/15(0730)	
		Extraction Fluid		2	
		Final Leachate pH		5.8	
3	AASL	Arsenic, Leachable (As)	5	< 0.5	mg/L
4	ABAL	Barium, Leachable (Ba)	5	1.7	mg/L
6	ACDL	Cadmium, Leachable (Cd)	5	< 0.02	mg/L
7	ACRL	Chromium, Leachable (Cr)	5	< 0.1	mg/L
8	APBL	Lead, Leachable (Pb)	5	< 0.2	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	5	< 0.1	mg/L
11	ASEL	Selenium, Leachable (Se)	5	< 0.5	mg/L
12	AAGL	Silver, Leachable (Ag)	5	< 0.05	mg/L
13	ATLL	Thallium, Leachable (Tl)	5	< 1	mg/L

COMMENTS:

3 An elevated detection limit was reported on this attribute due to sample matrix interference.

6 An elevated detection limit was reported on this attribute due to sample matrix interference.

7 An elevated detection limit was reported on this attribute due to sample matrix interference.

8 An elevated detection limit was reported on this attribute due to sample matrix interference.

10 An elevated detection limit was reported on this attribute due to sample matrix interference.

11 An elevated detection limit was reported on this attribute due to sample matrix interference.

12 An elevated detection limit was reported on this attribute due to sample matrix interference.

13 An elevated detection limit was reported on this attribute due to sample matrix interference.

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-217 TCLP
NUS SAMPLE NO: P0328720
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L

VALIDATED
Reviewed By
Date 11/19/96

Halliburton NUS
CORPORATION

NUS LABORATORY
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-217 TCLP
NUS SAMPLE NO: P0328720

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-218 TCLP
NUS SAMPLE NO: P0328721
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		11/15(1415)		
		End Date/Time		11/16(0630)		
		Extraction Fluid		1		
		Final Leachate pH		6.2		
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP				
		PCB-1221	1	< 0.5	ug/L	J
		PCB-1232	1	< 0.5	ug/L	J
		PCB-1242/1016	1	< 0.5	ug/L	J
		PCB-1248	1	< 0.5	ug/L	J
		PCB-1254	1	< 0.5	ug/L	J
		PCB-1260	1	< 0.5	ug/L	
16	OTCLP	SEMIVOLATILES - TCLP				
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1	mg/L	
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1	mg/L	
		2,4,5-trichlorophenol	10	< 0.5	mg/L	
		2,4,6-trichlorophenol	10	< 0.1	mg/L	
		2,4-dinitrotoluene	10	< 0.1	mg/L	
		2-methylphenol [o-cresol]	10	< 0.1	mg/L	
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1	mg/L	
		hexachlorobenzene	10	< 0.1	mg/L	
		hexachlorobutadiene	10	< 0.1	mg/L	
		hexachloroethane	10	< 0.1	mg/L	
		nitrobenzene	10	< 0.1	mg/L	
		pentachlorophenol	10	< 0.5	mg/L	
		pyridine	10	< 0.1	mg/L	

COMMENTS:

VALIDATED

Reviewed By [signature]
Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-219 TCLP
NUS SAMPLE NO: P0328722
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		5.1	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.48	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 11/9/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-220 TCLP
NUS SAMPLE NO: P0328723
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L

VALIDATED
Reviewed By [signature]
Date 1/19/96

Halliburton NUS
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November 29, 1995
Report No.: 00028449
Section A Page 25

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-220 TCLP
NUS SAMPLE NO: P0328723

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-221 TCLP
NUS SAMPLE NO: P0328724
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/15(1415)
		End Date/Time		11/16(0630)
		Extraction Fluid		1
		Final Leachate pH		5.0
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L
		PCB-1232	1	< 0.5 ug/L
		PCB-1242/1016	1	< 0.5 ug/L
		PCB-1248	1	< 0.5 ug/L
		PCB-1254	1	< 0.5 ug/L
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-222 TCLP
NUS SAMPLE NO: P0328725
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		11/15(1415)		
		End Date/Time		11/16(0630)		
		Extraction Fluid		1		
		Final Leachate pH		5.0		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.61	mg/L	
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L	
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L	
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L	
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED
Reviewed By
Date 1/1996

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-223 TCLP
NUS SAMPLE NO: P0328726
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
2	S904	Zero Headspace Extraction [ZHE]				
		Begin Date/Time		11/16(0900)		
		End Date/Time		11/16(0900)		
18	OVZHE	VOLATILES - TCLP/ZHE				
		1,1,1-trichloroethane	10	< 0.05	mg/L	
		1,1,2,2-tetrachloroethane	10	< 0.05	mg/L	
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05	mg/L	
		1,1,2-trichloroethane	10	< 0.05	mg/L	
		1,1-dichloroethane	10	< 0.05	mg/L	
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05	mg/L	
		1,2-dichloroethane	10	< 0.05	mg/L	
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5	mg/L	
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5	mg/L	
		acetone	10	< 0.5	mg/L	
		benzene	10	< 0.05	mg/L	
		carbon tetrachloride	10	< 0.05	mg/L	
		chlorobenzene	10	< 0.05	mg/L	
		chloroform	10	< 0.05	mg/L	
		cis-1,2-dichloroethene	10	< 0.05	mg/L	
		cyclohexane	10	< 0.1	mg/L	J
		cyclohexanone	10	< 0.5	mg/L	
		ethyl acetate	10	< 0.1	mg/L	
		ethyl benzene	10	< 0.05	mg/L	
		methyl benzene [toluene]	10	< 0.05	mg/L	
		methylene chloride	10	< 0.05	mg/L	
		tetrachloroethene [tetrachloroethylene]	10	< 0.05	mg/L	
		tribromomethane [bromoform]	10	< 0.05	mg/L	
		trichloroethene [trichloroethylene]	10	< 0.05	mg/L	
		trichloroflouromethane	10	< 0.1	mg/L	J
		vinyl chloride	10	< 0.1	mg/L	
		xylenes, total	10	< 0.05	mg/L	
20	G200W	ALCOHOLS				
		2-ethoxyethanol [ethyl glycol]	10	< 50	mg/L	J

VALIDATED

Reviewed By [signature]

Date 11/19/96

Halliburton NUS
CORPORATION

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November 29, 1995
Report No.: 00028449
Section A Page 29

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-223 TCLP
NUS SAMPLE NO: P0328726

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
		isobutanol	10	< 10	mg/L	J
		methanol	10	< 10	mg/L	↓
		n-butanol	10	< 10	mg/L	↓

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
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TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-224 TCLP
NUS SAMPLE NO: P0328727
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(1330)
		End Date/Time		11/17(0700)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS
CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-224 TCLP
NUS SAMPLE NO: P0328727

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-225 TCLP
NUS SAMPLE NO: P0328728
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/15(1415)
		End Date/Time		11/16(0630)
		Extraction Fluid		1
		Final Leachate pH		4.9
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L J
		PCB-1232	1	< 0.5 ug/L J
		PCB-1242/1016	1	< 0.5 ug/L J
		PCB-1248	1	< 0.5 ug/L J
		PCB-1254	1	< 0.5 ug/L J
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-226 TCLP
NUS SAMPLE NO: P0328729
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		4.9	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.35	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED

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Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-227 TCLP
NUS SAMPLE NO: P0328730
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		8.1
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L J
		PCB-1232	1	< 0.5 ug/L
		PCB-1242/1016	1	< 0.5 ug/L
		PCB-1248	1	< 0.5 ug/L
		PCB-1254	1	< 0.5 ug/L
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L J
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-228 TCLP
NUS SAMPLE NO: P0328731
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		6.1
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.036 mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02 mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1 mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01 mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-229 TCLP
NUS SAMPLE NO: P0328732
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
2	S904	Zero Headspace Extraction [ZHE]				
		Begin Date/Time		11/17(1330)		
		End Date/Time		11/18(0730)		
18	OVZHE	VOLATILES - TCLP/ZHE				
		1,1,1-trichloroethane	10	< 0.05	mg/L	
		1,1,2,2-tetrachloroethane	10	< 0.05	mg/L	
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05	mg/L	
		1,1,2-trichloroethane	10	< 0.05	mg/L	
		1,1-dichloroethane	10	< 0.05	mg/L	
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05	mg/L	
		1,2-dichloroethane	10	< 0.05	mg/L	
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5	mg/L	
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5	mg/L	J
		acetone	10	< 0.5	mg/L	
		benzene	10	< 0.05	mg/L	
		carbon tetrachloride	10	< 0.05	mg/L	
		chlorobenzene	10	< 0.05	mg/L	
		chloroform	10	< 0.05	mg/L	
		cis-1,2-dichloroethene	10	< 0.05	mg/L	
		cyclohexane	10	< 0.1	mg/L	J
		cyclohexanone	10	< 0.5	mg/L	
		ethyl acetate	10	< 0.1	mg/L	
		ethyl benzene	10	< 0.05	mg/L	
		methyl benzene [toluene]	10	< 0.05	mg/L	
		methylene chloride	10	< 0.05	mg/L	
		tetrachloroethene [tetrachloroethylene]	10	< 0.05	mg/L	
		tribromomethane [bromoform]	10	< 0.05	mg/L	J
		trichloroethene [trichloroethylene]	10	< 0.05	mg/L	J
		trichloroflouromethane	10	< 0.1	mg/L	J
		vinyl chloride	10	< 0.1	mg/L	
		xylenes, total	10	< 0.05	mg/L	
20	G200W	ALCOHOLS				
		2-ethoxyethanol [ethyl glycol]	10	< 50	mg/L	

VALIDATED

Reviewed By [signature]

Date 1/19/96

Halliburton NUS
CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-229 TCLP
NUS SAMPLE NO: P0328732

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED

Reviewed By

Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-230 TCLP
NUS SAMPLE NO: P0328733
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Begin Date/Time		11/15(1415)
		End Date/Time		11/16(0630)
		Extraction Fluid		1
		Final Leachate pH		6.3
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L J
		PCB-1232	1	< 0.5 ug/L J
		PCB-1242/1016	1	< 0.5 ug/L J
		PCB-1248	1	< 0.5 ug/L J
		PCB-1254	1	< 0.5 ug/L J
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:

VALIDATED

Reviewed By [signature]

Date 11/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-231 TCLP
NUS SAMPLE NO: P0328734
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		6.1	
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L UB
4	ABAL	Barium, Leachable (Ba)	1	0.85	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-232 TCLP
NUS SAMPLE NO: P0328735
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/17(1330)
		End Date/Time		11/18(0730)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L J
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L J
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L J
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L

VALIDATED
Reviewed By
Date 11/19/96

Halliburton NUS
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November 29, 1995
Report No.: 00028449
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-232 TCLP
NUS SAMPLE NO: P0328735

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L
		methanol	10	< 10 mg/L
		n-butanol	10	< 10 mg/L

COMMENTS:

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

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TEL: (412) 747-2500
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November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-233 TCLP
NUS SAMPLE NO: P0328736
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		5.0	
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP			
		PCB-1221	1	< 0.5	ug/L J
		PCB-1232	1	< 0.5	ug/L J
		PCB-1242/1016	1	< 0.5	ug/L J
		PCB-1248	1	< 0.5	ug/L J
		PCB-1254	1	< 0.5	ug/L J
		PCB-1260	1	< 0.5	ug/L
16	OTCLP	SEMIVOLATILES - TCLP			
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1	mg/L
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1	mg/L
		2,4,5-trichlorophenol	10	< 0.5	mg/L
		2,4,6-trichlorophenol	10	< 0.1	mg/L
		2,4-dinitrotoluene	10	< 0.1	mg/L
		2-methylphenol [o-cresol]	10	< 0.1	mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1	mg/L
		hexachlorobenzene	10	< 0.1	mg/L
		hexachlorobutadiene	10	< 0.1	mg/L
		hexachloroethane	10	< 0.1	mg/L
		nitrobenzene	10	< 0.1	mg/L
		pentachlorophenol	10	< 0.5	mg/L
		pyridine	10	< 0.1	mg/L

COMMENTS:

VALIDATED

Reviewed By _____

Date 11/9/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-234 TCLP
NUS SAMPLE NO: P0328737
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		5.1	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.73	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By [signature]
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-235 TCLP
NUS SAMPLE NO: P0328738
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS	
1	S903	TCLP Bottle Extraction				
		Begin Date/Time		11/15(1415)		
		End Date/Time		11/16(0630)		
		Extraction Fluid		1		
		Final Leachate pH		5.0		
3	AASL	Arsenic, Leachable (As)	1	0.1	mg/L	UB
4	ABAL	Barium, Leachable (Ba)	1	0.43	mg/L	
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L	
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L	
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L	
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L	
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L	
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L	
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L	
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L	

COMMENTS:

VALIDATED

Reviewed By _____

Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-236 TCLP
NUS SAMPLE NO: P0328739
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT	UNITS
1	S903	TCLP Bottle Extraction			
		Begin Date/Time		11/15(1415)	
		End Date/Time		11/16(0630)	
		Extraction Fluid		1	
		Final Leachate pH		5.1	
3	AASL	Arsenic, Leachable (As)	1	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.43	mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005	mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02	mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05	mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001	mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02	mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1	mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01	mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2	mg/L

COMMENTS:

VALIDATED
Reviewed By [signature]
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-237 TCLP
NUS SAMPLE NO: P0328740
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
2	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time		11/16(0900)
		End Date/Time		11/16(0900)
18	OVZHE	VOLATILES - TCLP/ZHE		
		1,1,1-trichloroethane	10	< 0.05 mg/L
		1,1,2,2-tetrachloroethane	10	< 0.05 mg/L
		1,1,2-trichloro-1,2,2-triflouroehtane	10	< 0.05 mg/L
		1,1,2-trichloroethane	10	< 0.05 mg/L
		1,1-dichloroethane	10	< 0.05 mg/L
		1,1-dichloroethene [1,1-dichloroethylene]	10	< 0.05 mg/L
		1,2-dichloroethane	10	< 0.05 mg/L
		2-butanone [methylethyl ketone] [MEK]	10	< 0.5 mg/L
		4-methyl-2-pentanone [methyl isobutlyl ketone	10	< 0.5 mg/L
		acetone	10	< 0.5 mg/L
		benzene	10	< 0.05 mg/L
		carbon tetrachloride	10	< 0.05 mg/L
		chlorobenzene	10	< 0.05 mg/L
		chloroform	10	< 0.05 mg/L
		cis-1,2-dichloroethene	10	< 0.05 mg/L
		cyclohexane	10	< 0.1 mg/L J
		cyclohexanone	10	< 0.5 mg/L
		ethyl acetate	10	< 0.1 mg/L
		ethyl benzene	10	< 0.05 mg/L
		methyl benzene [toluene]	10	< 0.05 mg/L
		methylene chloride	10	< 0.05 mg/L
		tetrachloroethene [tetrachloroethylene]	10	< 0.05 mg/L
		tribromomethane [bromoform]	10	< 0.05 mg/L
		trichloroethene [trichloroethylene]	10	< 0.05 mg/L
		trichloroflouromethane	10	< 0.1 mg/L J
		vinyl chloride	10	< 0.1 mg/L
		xylenes, total	10	< 0.05 mg/L
20	G200W	ALCOHOLS		
		2-ethoxyethanol [ethyl glycol]	10	< 50 mg/L J

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: RA-95-237 TCLP
NUS SAMPLE NO: P0328740

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
		isobutanol	10	< 10 mg/L J
		methanol	10	< 10 mg/L ↓
		n-butanol	10	< 10 mg/L ↓

COMMENTS:
2 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By [signature]
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-238 TCLP
NUS SAMPLE NO: P0328741
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		8.1
14	G122L	POLYCHLORINATED BIPHENYLS (PCBs)-TCLP		
		PCB-1221	1	< 0.5 ug/L J
		PCB-1232	1	< 0.5 ug/L
		PCB-1242/1016	1	< 0.5 ug/L
		PCB-1248	1	< 0.5 ug/L
		PCB-1254	1	< 0.5 ug/L
		PCB-1260	1	< 0.5 ug/L
16	OTCLP	SEMIVOLATILES - TCLP		
		1,2-dichlorobenzene [o-dichlorobenzene]	10	< 0.1 mg/L J
		1,4-dichlorobenzene [p-dichlorobenzene]	10	< 0.1 mg/L
		2,4,5-trichlorophenol	10	< 0.5 mg/L
		2,4,6-trichlorophenol	10	< 0.1 mg/L
		2,4-dinitrotoluene	10	< 0.1 mg/L
		2-methylphenol [o-cresol]	10	< 0.1 mg/L
		3/4-methylphenol [m-cresol/p-cresol[B]	10	< 0.1 mg/L
		hexachlorobenzene	10	< 0.1 mg/L
		hexachlorobutadiene	10	< 0.1 mg/L
		hexachloroethane	10	< 0.1 mg/L
		nitrobenzene	10	< 0.1 mg/L
		pentachlorophenol	10	< 0.5 mg/L
		pyridine	10	< 0.1 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By
Date 1/19/96

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

November 29, 1995
Report No.: 00028449

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. RICK CHAVEZ

NUS CLIENT NO: 1783 0003
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: RA-95-239 TCLP
NUS SAMPLE NO: P0328742
P.O. NO.: 500101

DATE SAMPLED: 06-NOV-95
DATE RECEIVED: 10-NOV-95
APPROVED BY: Simanic, Joanne

LN	TEST CODE	DETERMINATION	DILUTION FACTOR	RESULT UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH		5.8
3	AASL	Arsenic, Leachable (As)	1	< 0.1 mg/L
4	ABAL	Barium, Leachable (Ba)	1	0.037 mg/L
6	ACDL	Cadmium, Leachable (Cd)	1	< 0.005 mg/L
7	ACRL	Chromium, Leachable (Cr)	1	< 0.02 mg/L
8	APBL	Lead, Leachable (Pb)	1	< 0.05 mg/L
9	AHGL	Mercury, Leachable (Hg)	1	< 0.0001 mg/L
10	ANIL	Nickel, Leachable (Ni)	1	< 0.02 mg/L
11	ASEL	Selenium, Leachable (Se)	1	< 0.1 mg/L
12	AAGL	Silver, Leachable (Ag)	1	< 0.01 mg/L
13	ATLL	Thallium, Leachable (Tl)	1	< 0.2 mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

VALIDATED
Reviewed By [signature]
Date 1/19/96

APPENDIX 6

Letter from BLM and Phone Log of Conversation with the NMED Carlsbad Office Discussing Agency Inspections of the Brinderson and Construction Landfills

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Carlsbad Resource Area Headquarters
P.O. Box 1778
Carlsbad, New Mexico 88221-1778

IN REPLY REFER TO:
2920

December 8, 1995

RECEIVED

Bob Kaiser, Land Manager
Department of Energy
Carlsbad Area Office
PO Box 3090
Carlsbad, NM 88221

Dear Bob,

I wanted to follow up yesterdays conversation with this written documentation. As we discussed I was the realty specialist working with the DOE on the initial authorization and inspections of the landfills under BLM permits NM-067-LUP-219 and NM-067-LUP-237 from January, 1985 to october, 1987. In my capacity as a reality specialist I had been doing landfill inspections for the BLM since 1982, working closely with the New Mexico Environmental Division.

During the numerous inspections I conducted in that time, I never saw any evidence of the disposal of any unauthorized materials. The contents of the pits were consistently construction debris. I never saw any drums or unmarked containers that may have contained toxic or hazardous substances.

As usual, it was a pleasure to work with the WIPP site again. If I can be of any further assistance to you or any other interested or affected parties please don't hesitate to call.

Sincerely,

James R. Goodbar

TELEPHONE CONFERENCE MEMORANDUM
WESTINGHOUSE FORM 22822 B

DATE 12/07/95

☐ INCOMING ☑ OUTGOING C.O. _____ G.O. _____

WITH JIM SMITH OF THE NMED - CARLSBAD OFFICE

WITH _____ OF THE _____

COPIES TO: _____

SUBJECT: INSPECTION RECORDS FROM NMED AND BLM LANDFILL INSPECTIONS

TIME _____

COST _____

FILE _____

CHARGE _____

DETAIL OF CONFERENCE FOLLOW-UP TO 12/04/95 CALL REQUESTING COPIES OF RECORDS FROM NMED CONSTRUCTION/BRINDERSON LANDFILL INSPECTIONS.

1) MR. SMITH STATED THAT NO RECORDS WERE FOUND IN EITHER CARLSBAD OR ROSWELL OFFICES.

2) HE COMPLETED A COUPLE INSPECTIONS WITH JIM GOODBAR OF BLM. HE STATED THAT THE NMED JUST WENT ON THESE INSPECTIONS TO REVIEW BLM OPERATIONS — AND THAT HE ~~ONLY WENT WHAT~~ DCM 12/7/95 WAS TRANSFERED TO ANOTHER POSITION AND DIDN'T GO ON ANY OTHER INSPECTIONS.

3) HE STATED THAT BLM HAD REGULATORY AUTHORITY FOR THIS SIGHT AS THE PERMITTING AGENCY (IE CONSTRUCTION DEBRIS LANDFI AND THAT HE SAW NO PROBLEMS WITH THE SITES DURING HIS JOINT BLM/NMED INSPECTIONS

4) SUGGESTED CONTACTING ~~BTH~~ FOR JIM GOODBAR AT BLM FOR FURTHER INF

DEPT. ECES

(SIGNATURE)

EXT. NO. 824

APPENDIX 7

Construction Debris Disposal Forms for the WIPP Construction Landfill (1988-1996)

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Francis H Quattro

Company: (99) op. Const.

Date: 2 20 96

PCNI Time: 0830

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Construct wast (Concrete/lumber) Debris	2 cubic yards

Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONTROLLED COPY

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Gwen Gist

Company: Westinghouse Electric

Date: 082395

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
55 gal. drums filled w/concrete	20 drums

Gwen Gist
Landfill User Signature
MYES 8/23/95

Tom Ward
Landfill Custodian Signature

WP Form 1633; 08/18/91
Page 1 of 1

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Gwen Gist

Company: Westinghouse

Date: 082495

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Super Bristar 2000 (19 bags)	3.42 kg
Downflake 77 - 80% (12 bags)	1,200 lbs
Celtite Technik (7 bags)	336 lbs
Lumber	234 board feet

Gwen Gist
Landfill User Signature

Landfill Custodian Signature

8/24/95

WP Form 1633; 08/18/91
Page 1 of 1

0891W:01741

HOW TO USE

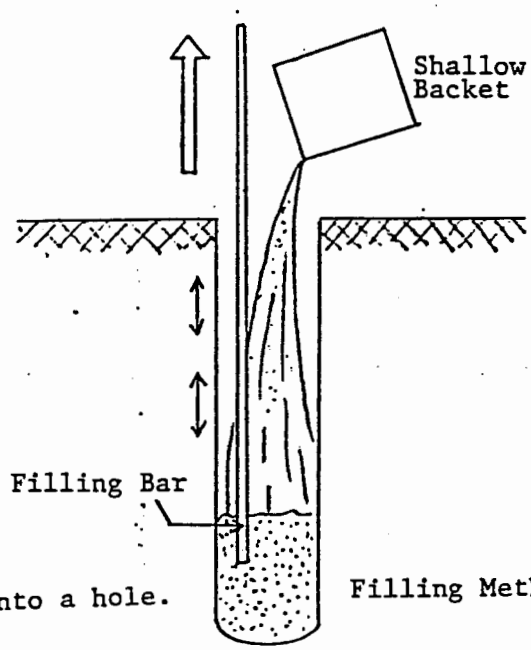
SUPER BRISTAR 2000

1. Mixing

1) Mix SUPER BRISTAR 2000 uniformly and rapidly with approximately 1 litre of water per 5 kg of SUPER BRISTAR 2000 by hand or mechanical mixer.

2) Maximum mixing quantity of SUPER BRISTAR 2000 is 5 kg at a time.

3) Mix SUPER BRISTAR 2000 within 20 seconds.



Filling Method

2. Filling

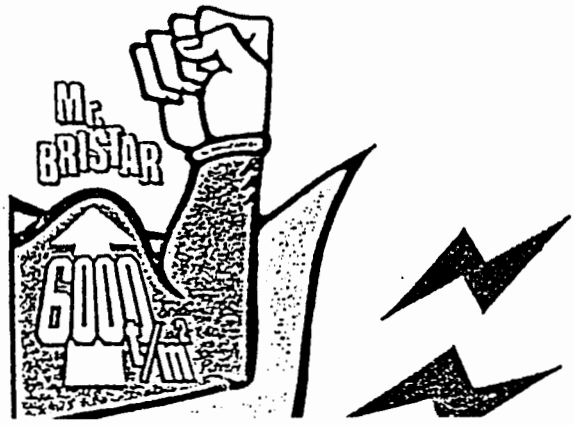
1) Put a filling bar with 2 mm to 5 mm diameter into a hole.

2) Pour the mixture of SUPER BRISTAR 2000 and water into a hole moving the filling bar up and down lightly, gradually extracting it.

3) The mixture of SUPER BRISTAR 2000 and water should be poured into holes within 2 minutes.

3. Storage

Store SUPER BRISTAR 2000 in a dry place. If a bag of SUPER BRISTAR 2000 is partially used, push out the air in bag and seal it with tape. Use it as soon as possible.



Quantity per Hole Depth

Hole Diameter (mm)	42	44	46
Bit Size (inch)	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$
SUPER BRISTAR 2000	2.7	3.0	3.3

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Gwen R. Gist

Company: Westinghouse

Date: 27 December 1995

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Foam insulation	6 cu. yds.

Gwen R. Gist
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Teddy T. Garcia

Company: WestTinghouse

Date: 8-7-95 — 9-6-95

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
~~center~~ blocks 8-8-95 CINDER AND CEMENT DEBRIS	400 (cu. ~~yds~~ ft) 8-8-95

Teddy T. Garcia
Landfill User Signature

Roy L. White
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: GEORGE WILCOX

Company: CONSTRUCTORS INC. 815-5369

Date: 8/21/95

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
DIRT	120 yds³

Landfill User Signature

Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: GWEN GIST

Company: WESTINGHOUSE

Date: 24 JULY 1995

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
CONCRETE WITH REBAR HANDLE	12 ITEMS SIZE: 3' X 3' X 3'
STEEL WRAPPED CONCRETE	14 ITEMS SIZE: 10' DIAMETER X 2' HIGH
STEEL WRAPPED CONCRETE	1 ITEM SIZE: 10' DIAMETER X 7' HIGH

Gwen Gist
Landfill User Signature

Tom Ward
Landfill Custodian Signature

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: MARK BROOKS.

Company: CONSTRUCTORS INC.

Date: 7-10-95

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
SAND + CALICHE	100 cu yds

Mark Brooks
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: MARK BROOKS

Company: CONSTRUCTOR'S INC.

Date: 6-29-95

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
CALICHE + SAND	100

Mark Brooks
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Teddy T. Garcia

Company: Westinghouse

Date: 3-3-95

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Concrete	20-cub. yds

Landfill User Signature

Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: J. J. WINKEL

Company: (W)

Date: 1/17/95 1200

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Inspected landfill CONDITIONS: DRY ARTICLES IN LANDFILL: 1. Grout Drum (open) 2. Large Concrete Block 3. 1 GALVANIZED Culvert CONDITIONS SATISFACTORY	

Landfill User Signature

Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Randy L. Walders

Company: W

Date: ~~1-10-94~~ RC 1/10-95 1-10-95

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
1 Barrel of Solid Grout from U/G drilling	55 G Barrel

Landfill User Signature

Robert Carrasco
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Danny Ramirez

Company: W

Date: 12-29-94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
4 x 6 Concrete Block	4 yds

Landfill User Signature

Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: _____

Company: CONSTRUCTORS

Date: 21 SEP 94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
EARTH, CONCRETE, ASPHALT	3 TRUCKS 18 YS EA 54 YDS

Kelly Westfall
Landfill User Signature

J. V. Boris
Landfill Custodian Signature

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: _____

Company: CONSTRUCTORS

Date: 1 SEP 94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)	
EARTH, CONCRETE, ASPHALT	TRUCKS ~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ IIII	YDS 9 ea. 216

Kelly Westfall
Landfill User Signature

J. V. Boris
Landfill Custodian Signature

0891W:01741

CONTROLLED COPY

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: _____

Company: CONSTRUCTORS

Date: 31 ~~SEPT~~ AUG 94 9M3 31 AUG 94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)	
EARTH, CONCRETE, ASPHALT	TRUCKS ~~LHT~~ ~~LHT~~ ~~LHT~~ ~~LHT~~ ~~LHT~~ ~~LHT~~ ~~LHT~~ I	YDS 9 ea 324

Kelly Westfall
Landfill User Signature

J. R. Bo
Landfill Custodian Signature

0691W:01741

CONTROLLED COPY

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: CONSTRUCTORS INC. MARK BROOKS

Company: " "

Date: 9-15-94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
8 yds 2" ROCK	8 yds

Mark Brooks
Landfill User Signature

J. Winkel 9/15/94
Landfill Custodian Signature
FROM TMF/Support Bldg Roof Repair

WP Form 1633; 08/18/91
Page 1 of 1

0891W:01741

Operations
234-8234
August 31, 1994
To: Construction Landfill File
From: J. J. Winkel
Subject: Construction Landfill Designee

This memo is designate Mr. Jim Boris as the Construction Landfill Custodian designee for the purpose of clearing the area for the new bus and employee parking lot. Mr. Boris has the authority to permit the following materials into the Construction Landfill: Wood in the form of native scrub brush, soil, asphalt, and concrete curbing and sidewalk. Mr. Bois understands that access to the Construction Landfill is restricted and the gate to the Construction Landfill is to be locked when he is not in attendance.

I have read procedure WP 06-108, Construction Landfill Operation, and understand its requirements.

J. Boris
Jim Boris

31 August
Date

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: _____

Company: Constructors Inc.

Date: 8-10-94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
sand cement Brush	2 Trucks X 8 YS
	2
	2
	2
	2
	2
	2
	2
	2
	2
	2
asphalt + sand - Brush	2
	2
	2
	2
	2
	2
	2
	2
	2
	1
	344 Yds

Kelly Westfall
Landfill User Signature

J.V. Bow
Landfill Custodian Signature

0891W:01741

CONTROLLED COPY

Operations
234-8234
August 10, 1994
To: Construction Landfill File
From: J. J. Winkel JW
Subject: Construction Landfill Designee

This memo is designate Mr. Ray Ashford as the Construction Landfill Custodian designee for the purpose of clearing the area for the new bus parking lot. Mr. Ashford has the authority to permit the following materials into the Construction Landfill: Wood in the form of native scrub brush, soil and concrete curbing and sidewalk. Mr. Ashford understands that access to the Construction Landfill is restricted and the gate to the Construction Landfill is to be locked when he is not in attendance.

I have read procedure WP 06-108, Construction Landfill Operation, and understand its requirements.

Ray Ashford
Ray Ashford

8-10-94
Date
8/10/94 JW

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Kelley WesTfall

Company: Constructors Inc.

Date: 21 July 94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Soil & Vegatable matter (Brush/wood)	1. 18 yd
	2. 20
	3. 20
	4 20
	5. 20
	6. 20
	7. 20
	8. 18
	9. 20
	10. 20
	11. 20
	12. 20
	13. 20
	14. 20
	15. 20
	16. 18
	17. 20
	18. 20
	19. 20
	374 CY

Kelly Westfall Cons. Inc.
Landfill User Signature

J. V. Bow
Landfill Custodian Signature

See letter in File
7/25/94

WP Form 1633; 08/18/91
Page 1 of 1

0691W:01741

CONTROLLED COPY

Operations
234-8234
July 21, 1994
To: File
From: J. J. Winkel
Subject: Construction Landfill Designee

This memo is designate Mr. Jim V. Boris as the Construction Landfill Custodian designee for the purpose of clearing the area for the new parking lot. Mr. Boris has the authority to permit the following materials into the Construction Landfill: Wood in the form of native scrub brush and soil. Mr. Boris understands that access to the Construction Landfill is restricted and the gate to the Construction Landfill is to be locked when he is not in attendance.

I have read procedure WP 06-108, Construction Landfill Operation, and understand its requirements.

J. V. Boris — Jim V. Boris

21 Jul 94 — Date

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: MARK BROOKS

Company: CONSTRUCTORS INC.

Date: 6-15-94

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
CONCRETE + DIRT	36 cu. yds

Mark Brooks
Landfill User Signature

Roy L. White
Landfill Custodian Signature

0891W:01741

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George,

I spoke to Mr. Don Beardsley of the New Mexico Environment Department Solid Waste Bureau regarding the recent revisions to the EIB/SWMR-4 and specifically to those comments submitted to you from Jeff Winkel. Some of Jeff's concerns have been previously addressed with the Bureau and since the wording in the regulations was not changed in the current revision, I did not bring those up again. Specifically, that was the comment regarding the time limitation for storing infectious waste. We should continue to manage facility infectious waste as we are now. All other comments are addressed below.

The WIPP Construction and Demolition (C & D) landfill so long as it continues to reside on DOE property, accepts only construction and demolition debris from on-site activities in less than 25 tons-per-day (tpd) quantities, and does not violate any provision of the requirements, is still exempt under section 108(C) of EIB/SWMR-4. Therefore, the additional sections regarding C & D landfills and operator certification do not apply to the WIPP facility at this time.

Section 704 requires that chemical characteristics of special wastes be documented by means of: sample results **and** process knowledge. There was no change from the previous (EIB/SWMR-3) regulations. However, Mr. Beardsley stated that one of the two methods would be adequate for waste characterization purposes. The "and" should probably be an "or" so that only one of the two requirements would be necessary.

I described to Mr. Beardsley that Section 712 requires that all manifests accompanying special waste shipments contain specified information and that it is not possible for the generator to provide the information at the time of manifest generation that is required by section 712(A)(2,6 & 9). This is provided to the generator by the treatment, storage, or disposal facility accepting the waste through the return of the original manifest. He agreed that the wording is not as clear as it should be and that we were right in our interpretation that the returned manifest would meet the requirements of this part.

If I can be of further service regarding these requirements, please contact me at 8190.

Joe Wilks

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Steve GREER

Company: GREER Const

Date: 11/30/93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
DIRT + BASE COURSE	10 cu. yds

Steve Greer
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Steve Greer

Company: GREER CONST

Date: 11/10/93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
CONCRETE - SAND CALiche mix	10 cu. yds

Steve Greer
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: STEVE GREER

Company: GREER CONST.

Date: 11/9/93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
CONCRETE + DIRT	6 Cubic yards

Steve Greer
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: HOMER SCRIMSHAE

Company: CONSTRUCTORS

Date: 10-6-93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
SAND + GRAVEL + DIRT	120 TONS

Homer Scrimshaw
Landfill User Signature

Landfill Custodian Signature

0891W:01741

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CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Bob Pasley

Company: (W)

Date: 8/4/93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Wash-out from concrete truck + lumber (form material)	1 cu. yd.

8/4/93
Landfill User Signature

Landfill Custodian Signature

0891W:01741

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: MARK BROOKS

Company: CONSTRUCTOR'S INC.

Date: 5-28-93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
CONCRETE	12

Mark Brooks
Landfill User Signature

Lynn Tenney
Landfill Custodian Signature

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Fred Padilla

Company: (W)

Date: 5/13/93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
18 - 55 gal. drums of solid grout	5 cu. yd.

Landfill User Signature

Landfill Custodian Signature

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Bob Pasley

Company: W Construction

Date: 1/27/93

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Dirt + concrete	100 cu. yds.

RECORD

1/27/93
Landfill User Signature

1/27/93
Landfill Custodian Signature

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Doug Schoen

Company: (W)

Date: 12/2/92

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Wooden crates	25 cu. yds.

Landfill User Signature

Landfill Custodian Signature

0891W:01741

CONTROLLED COPY

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: MICHAEL A. WEBB

Company: (W) EC

Date: 2/10/92

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Dirt and concrete debris from UST project.	.7

Michael A. Webb
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

RECORD

Print Name: Rijk Moräwe

Company: Westinghouse - Environmental Monitoring

Date: 21. Feb. 92

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
lumber, concrete	27 yds

Rijk Moräwe
Landfill User Signature

Ruben Carrasco
Landfill Custodian Signature

0891W:01741

CONTROLLED COPY

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: MICHAEL WEBB

Company: W

Date: 11/6/92

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Concrete and dirt from underground storage tank removal	2.4

Michael A. Webb
Landfill User Signature

Landfill Custodian Signature

WP Form 1633; 08/18/91
Page 1 of 1

0891W:01741

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Royce Allen

Company: Westinghouse Electric Corp / WIPP

Date: 12/18/91

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Concrete from underground storage tank removal. Debris consisting of dirt with metal strips	2.0

Landfill User Signature

Landfill Custodian Signature

0891W:01741

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: ROYCE ALLEN

Company: Westinghouse Electric Corp / WDOP

Date: 12/17/91

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Concrete from underground STORAGE TANK removal. Debris consisting of dirt to include metal strips	6.0

Royce Allen
Landfill User Signature

John J. Grau
Landfill Custodian Signature

WP Form 1633; 08/18/91
Page 1 of 1

0891W:01741

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: ROYCE ALLEN

Company: Westinghouse Electric Corp / WIPP SITE

Date: 12/16/91

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Concrete from underground storage TANK removal. Debris consisting of dirt to include metal strips.	7.5

Landfill User Signature

Landfill Custodian Signature

0891W:01741

RECORD

CONSTRUCTION DEBRIS DISPOSAL FORM

Print Name: Royce Allen

Company: Westinghouse Electric Corp / WIPP SITE

Date: 12/13/91

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Concrete from underground storage tank removal. Debris also consisting of dirt along with metal strips used as reinforcement.	12.0

Landfill User Signature

Landfill Custodian Signature

WP Form 1633; 08/18/91
Page 1 of 1

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CONSTRUCTION DEBRIS DISPOSAL FORM

RECORD

Print Name: THMH

Company: (W)

Date: 12/9/91

Description of Debris (e.g., lumber, concrete, pipes, etc.)	Estimated Volume of Debris (cu. yds.)
Wooden pallets, plywood, 2x4's	10 cu. yds.

Landfill User Signature

Landfill Custodian Signature

0891W:01741

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Julius Doubrava

Organization: Constractors Inc.

Date of Initial Use: 6/27/91

Date of Final Use: 6/27/91

Estimated Volume of Debris: Approx. 84 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Mixture of: Dirt
Caliche
Blow sand
pieces of Concrete
pieces of Asphalt

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: ACEW ENG. Organization: CONSTRUCTION

Date of Initial Use: 6/18/91

Date of Final Use: 6/20/91

Estimated Volume of Debris: 50 yards cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

48 yards of gravel
2 yards ~~[illegible]~~ [illegible]

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: EDWARD McGARY
BART SMITH

Organization: (W) DRILLING DEPT.

Date of Initial Use: N/A

Date of Final Use: 4/8/91

Estimated Volume of Debris: 6 SACKS cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

2 WOOD PALLETS
6 SACKS PARTIALLY USED (BENTONITE (4) - CEMENT (2))
6 PAPER SACKS THAT WERE EMPTY (TRASH)

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: MARK BROOKS Organization: CONSTRUCTORS INC

Date of Initial Use: 2-22-91

Date of Final Use: 2-22-91

Estimated Volume of Debris: 1 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

CONCRETE

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Green Organization: Green const

Date of Initial Use: 2/21/91

Date of Final Use: 2/21/91

Estimated Volume of Debris: 2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
scrap lumber + cardboard

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Gerald Ashford Organization: Underground OPS

Date of Initial Use: 2/11/91

Date of Final Use: 2/22/91

Estimated Volume of Debris: 60 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete removed from Waste Station floor, with some rebar

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Green Organization: Green Const

Date of Initial Use: 2/11/91

Date of Final Use: 2/11/91

Estimated Volume of Debris: 1 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Scrap lumber + Scrap center block
cardboard boxes

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Green

Organization: Green Const Co Inc.

Date of Initial Use: 1/15/91

Date of Final Use: 1/15/91.

Estimated Volume of Debris: one cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Clean out concrete pump truck

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Breer

Organization: Breer Const Co. Inc

Date of Initial Use: 1/14/91

Date of Final Use: 1/14/91

Estimated Volume of Debris: one cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
clean out concrete pump truck

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Greer

Organization: Greer Const Co.

Date of Initial Use: 1/7/91

Date of Final Use: 1/7/91

Estimated Volume of Debris: one cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
clean out concrete pump truck

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Greer

Organization: Greer const co.

Date of Initial Use: 1/4/91

Date of Final Use: 1/4/91

Estimated Volume of Debris: 3 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Scrap plywood - 2x4's misc lumber

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co. Inc.

Date of Initial Use: 12/28/90

Date of Final Use: 12/28/90

Estimated Volume of Debris: 40 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Asphalt - Caliche - Sand

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Organization:

Date of Initial Use: 12/20/90

Date of Final Use: 12/20/90

Estimated Volume of Debris: 2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Cleaned out concrete pump truck, and piles of left over concrete from testing.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve Greer Organization: Cencor Const. Co. Inc

Date of Initial Use: 12-19-90

Date of Final Use: 12-19-90

Estimated Volume of Debris: 1 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Clean out concrete pump.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name:

Organization:

Constructor's Inc.

Date of Initial Use:
Sept 20-90

Date of Final Use:
Sept 21-90

Estimated Volume of Debris: 70 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Sand and Caliche

Vicente Carrasco

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Green Const. Co.

Date of Initial Use: 8-24-90

Date of Final Use: 8-24-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): Cardboard
plastic
metal
paper

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co.

Date of Initial Use: 8-14-90

Date of Final Use: 8-14-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): Carpet Scrapes Paper and Cardbo

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: ~~Constructors Inc~~ GEORGE WILCOX

Organization: CONSTRUCTORS INC

Date of Initial Use: 8-13-90

Date of Final Use:

Estimated Volume of Debris: 20 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
DIRT, LUMBER, & CONCRETE

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co

Date of Initial Use: 8-3-90

Date of Final Use: 8-3-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): lumber
cardboard
metal
plastic

WP Form 1633

MORANG

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Rich Organization: Greer Const. Co.

Date of Initial Use: 7-24-90

Date of Final Use: 7-24-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): Lumber
Cardboard

WORKING COPY

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nielsen Organization: Greer Const.

Date of Initial Use: 7-25-90

Date of Final Use: 7-25-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): cardboard
plastic
lumber

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Bob Underwood Organization: Greer Const. Co., Inc.

Date of Initial Use: 7-18-90

Date of Final Use: 7-18-90

Estimated Volume of Debris: 4 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Cardboard

WORKING COPY

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Bob Underwood Organization: Greer Const. Co., Inc.

Date of Initial Use: 7-9-90

Date of Final Use: 7-9-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Cardboard

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Niles Organization: Greer Const. Co.

Date of Initial Use: 6-27-90

Date of Final Use: 6-27-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): Cardboard
Lumber
wood

6/27/90

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co.

Date of Initial Use: 6-20-90

Date of Final Use: 6-20-90

Estimated Volume of Debris: 3 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): cardboard
wood
constructors-
fill

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joel [illegible] Organization: Greer Const. Co.

Date of Initial Use: 6-15-90

Date of Final Use: 6-15-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): lumber
cardboard
conduit pipe

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co.

Date of Initial Use: 4-11-90

Date of Final Use: 4-11-90

ORIGINAL

Estimated Volume of Debris: 5 to 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

lumber
metal
paper
plastic

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co.

Date of Initial Use: 4-4-90

Date of Final Use: 4-4-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Lumber
Metal Sheeting
2" vinyle face insulation
Metal Studs

ORIGINAL

vg 4/4

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Green Coast Co., Inc

Date of Initial Use: 6-7-90

Date of Final Use: 6-7-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): sheetrock
metal
cardboard
lumber
paper

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co.

Date of Initial Use: 5-31-90

Date of Final Use: 5-31-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

sheetrock
cardboard
metal studs
paper

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co.

Date of Initial Use: 5-24-90

Date of Final Use: 5-24-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Scrape - sheetrock
lumber
metal studs
cardboard

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joel Nichols Organization: Greer Const. Co. Inc

Date of Initial Use: 5-21-90

Date of Final Use: 5-21-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

lumber
Cardboard boxes
Sheetrock
metal stud scrapes

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Green Const. Co.

Date of Initial Use: 5-7-90

Date of Final Use: 5-7-90

Estimated Volume of Debris: 2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Concrete & Ashphalt

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Vicente Carrasco Organization: Const. INC.

Date of Initial Use: May 16-90

Date of Final Use: May 16-90

Estimated Volume of Debris: 40 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Sand & Gravel

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co.

Date of Initial Use: 5-4-90

Date of Final Use: 5-4-90

Estimated Volume of Debris: 3 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

concrete
lumber
metal
insulation
DIRT

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co. Inc

Date of Initial Use: 4-30-90

Date of Final Use: 4-30-90

Estimated Volume of Debris: 5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Cardboard and paper
Metal Scrapes
Lumber
Insulation

WORKING COPY

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: *Vicente Carrasco* Organization: *Constructors, Inc.*

Date of Initial Use: *April 11, 1990*

Date of Final Use: *April 13, 1990*

Estimated Volume of Debris: *60* cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.): *Sand and caliche mix some concrete.*

ORIGINAL

Vicente Carrasco
4-10-90

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Greer Const. Co.

Date of Initial Use: 4-4-90

Date of Final Use: 4-4-90

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Lumber
Metal Sheeting
2" vinyle face insulation
Metal Studs

WORKING COPY

vg 4/4

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co.

Date of Initial Use: 4-11-90

Date of Final Use: 4-11-90

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Estimated Volume of Debris: 5 to 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

lumber
metal
paper
plastic

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: *Vicente Carrasco* **Organization:** *Constructors, Inc.*

Date of Initial Use: *April 11, 1990*

Date of Final Use: *April 13, 1990*

Estimated Volume of Debris: *60* **cu. yds.**

Description of Debris (e.g., lumber, concrete, pipes, etc.): *Sand and caliche mix some concrete.*

WORKING COPY

Vicente Carrasco
4-10-90

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: [illegible] Organization: [illegible]

Date of Initial Use: 2-9-90

Date of Final Use: 2-9-90

Estimated Volume of Debris: 1½ cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: [illegible] Organization: [illegible] Co.

Date of Initial Use: 2-7-90

Date of Final Use: 2-7-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Green Const. Co

Date of Initial Use: 2-6-90

Date of Final Use: 2-6-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Washed out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co.

Date of Initial Use: 2-5-90

Date of Final Use: 2-5-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Washed out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co

Date of Initial Use: 2-2-90

Date of Final Use: 2-2-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Washed out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: [illegible] Organization: Greer Const. Co.

Date of Initial Use: 2-1-90

Date of Final Use: 2-1-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Nichols Organization: Grear Const. Co.

Date of Initial Use: 1-31-90

Date of Final Use: 1-31-90

Estimated Volume of Debris: 1 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Washed out concrete pump
Concrete Debris

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Green Const. Co

Date of Initial Use: 1-30-90

Date of Final Use: 1-30-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Washed out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Green Const. Co.

Date of Initial Use: 1-29-90

Date of Final Use: 1-29-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

wash out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Rilw Organization: Greer Const.

Date of Initial Use: 1-25-90

Date of Final Use: 1-25-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joel [illegible] Organization: Greer Const. Co

Date of Initial Use: 1-24-90

Date of Final Use: 1-24-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co

Date of Initial Use: 1-23-90

Date of Final Use: 1-23-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Pulos Organization: Greer Const. Co.

Date of Initial Use: 1-24-90

Date of Final Use: 1-24-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe [illegible] Organization: Greer Const. Co

Date of Initial Use: 1-23-90

Date of Final Use: 1-23-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Wash out concrete pump.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Bob Underwood Organization: Greer Const. Co.

Date of Initial Use: 1-18-90

Date of Final Use: 1-18-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Bob Underwood Organization: Green Const. Co, Inc.

Date of Initial Use: 1-17-90

Date of Final Use: 1-17-90

Estimated Volume of Debris: 1/2 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC Organization: CONTRACTOR

Date of Initial Use: 7/10/89

Date of Final Use: 7/14/89

Estimated Volume of Debris: 9522 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPAV DRILL POND

7/10/89 - 2144 YRDS
7/11/89 - 2060 YRDS
7/12/89 - 2210 YRDS
7/13 89 - 1570 YRDS
7/14/89 - 1538 YRDS

TOTAL 9522 YRDS.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC. Organization: CONTRACTOR

Date of Initial Use: 7/5/89

Date of Final Use: 7/7/89

Estimated Volume of Debris: 2864 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPDV DRILL POND

7/5/89 0

7/6/89 1192 YRDS (STARTED)

7/7/89 1672 YRDS

TOTAL 2864 YRDS

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joneen Cockman
Sweatt Construction Co.

Organization: REPS Reclamation

Date of Initial Use: 7.14.89

Date of Final Use: 7.14.89

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Plastic liner from WIPP 12 reserve pit.

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC Organization: CONTRACTOR

Date of Initial Use: 7/17/89

Date of Final Use: 7/21/89

Estimated Volume of Debris: 8350 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPDV DRILL POND

7/17/89 - 1260 YRDS. (SLAB OF CONCRETE & PVC PIPE)

7/18/89 - 1670 YRDS

7/19/89 - 2090 YRDS

7/20/89 - 1760 YRDS

7/21/89 - 1570 YRDS

TOTAL 8350 YRDS

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC. Organization: CONTRACTORS

Date of Initial Use: 7/24/89

Date of Final Use: 7/28/89

Estimated Volume of Debris: 6180 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPDV DRILL POND

7/24/89 - 1810 YRDS

7/25/89 - 1290 YRDS

7/26/89 1240 YRDS

7/27/89 740 YRDS

7/28/89 1100 YRDS

TOTAL 6180 YRDS

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Lynn Terpening Organization: Operations

Date of Initial Use: 6/6/89

Date of Final Use: 6/6/89

Estimated Volume of Debris: 10 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

concrete slabs

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Russell Leach

Organization: Reps

Date of Initial Use: 15 May 89

Date of Final Use: 15 May 89

Estimated Volume of Debris: 1 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete
Re-bar
Sheet metal
Plastic
wood

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Ed Barnes Organization: Cavern City Const.

Date of Initial Use: 4-28-89

Date of Final Use: 4-30-89

Estimated Volume of Debris: 50 cu. yds. _

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Contaminated Fill

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Lynn Terpening

Organization: Operations

Date of Initial Use: 4/24/89

Date of Final Use: 4/24/89

Estimated Volume of Debris: 10 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: ALEX LUCERO

Organization: CAVERN City Const.

Date of Initial Use: 4/20/89

Date of Final Use: 4/20/89

Estimated Volume of Debris: Contaminated cu. yds.
CALISHE

Description of Debris (e.g., lumber, concrete, pipes, etc.):

CALISHE ✓ RED dirt mixed

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Dave Hobson

Organization: Frontier Kempt

Date of Initial Use: 4/13/89

Date of Final Use: 4/13/89

Estimated Volume of Debris: .5 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

lumber & scrap metal

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Kerry Horner

Organization: Frontier Kemper

Date of Initial Use: 4/12/89

Date of Final Use: 4/12/89

Estimated Volume of Debris: 3<4 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Timbers & lumber, scrap iron, scrap wire rope.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: G M Bud Barnes Organization: Cauern City Const,

Date of Initial Use: 4-11-84

Date of Final Use: 4-11-84

Estimated Volume of Debris: 26 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete, Contaminated Backfill

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve L Anderson **Organization:** R.E.P.S.

Date of Initial Use: 04-07-89

Date of Final Use: 04-10-89

Estimated Volume of Debris: 4 to 6 **cu. yds.**

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Discarded:

Lumber

Small metal pieces

Plastic Shredded pieces

All less than 3 feet long.

approved 4/7/89

S K Becker

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Vasquez **Organization:** Maint

Date of Initial Use: N/A 2-27-89 JV

Date of Final Use: N/A 2-27-89 JV

Estimated Volume of Debris: 2 crates cu. yds. 1/2 cu. yds

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Old crates

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC Organization: CONTRACTOR

Date of Initial Use: 7/10/89

Date of Final Use: 7/14/89

Estimated Volume of Debris: 9522 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPOV DRILL POND

7/10/89 - 2144 YRDS
7/11/89 - 2060 YRDS
7/12/89 - 2210 YRDS
7/13 89 - 1570 YRDS
7/14/89 - 1538 YRDS

TOTAL 9522 YRDS.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC. Organization: CONTRACTOR

Date of Initial Use: 7/5/89

Date of Final Use: 7/7/89

Estimated Volume of Debris: 2864 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPDV DRILL POND

7/5/89 0

7/6/89 1192 YRDS (STARTED)

7/7/89 1672 YRDS

TOTAL 2864 YRDS

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joneen Cockman
Sweatt Construction Co.

Organization: REPS Reclamation

Date of Initial Use: 7.14.89

Date of Final Use: 7.14.89

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Plastic liner from WIPP 12 reserve pit.

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC Organization: CONTRACTOR

Date of Initial Use: 7/17/89

Date of Final Use: 7/21/89

Estimated Volume of Debris: 8350 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPDV DRILL POND

7/17/89 - 1260 YRDS. (SLAB OF CONCRETE & PVC PIPE)

7/18/89 - 1670 YRDS

7/19/89 - 2090 YRDS

7/20/89 - 1760 YRDS

7/21/89 - 1570 YRDS

TOTAL 8350 YRDS

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: CONSTRUCTORS, INC. Organization: CONTRACTORS

Date of Initial Use: 7/24/89

Date of Final Use: 7/28/89

Estimated Volume of Debris: 6180 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

EXCAVATION FROM SPOV DRILL POND

7/24/89 - 1810 YRDS

7/25/89 - 1290 YRDS

7/26/89 1240 YRDS

7/27/89 740 YRDS

7/28/89 1100 YRDS

TOTAL 6180 YRDS

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joneen Cockman
Sweatt Construction Co.

Organization: REPS Reclamation

Date of Initial Use: 7.14.89

Date of Final Use: 7.14.89

Estimated Volume of Debris: 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Plastic liner from WIPP 12 reserve pit.

WP Form 1633

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Kerry Horner

Organization: Frontier Kemper

Date of Initial Use: 4/12/89

Date of Final Use: 4/12/89

Estimated Volume of Debris: 3/4 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):
Timbers & lumber, scrap iron, scrap wire rope.

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: [illegible] Organization: [illegible]

Date of Initial Use: 4-11-89

Date of Final Use: 4-11-89

Estimated Volume of Debris: 26 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Concrete, Contaminated Backfill

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Steve L Anderson Organization: [illegible]

Date of Initial Use: 04-07-89

Date of Final Use: 04-10-89

Estimated Volume of Debris: 4 to 6 cu. yds.

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Discarded:

Lumber

Small metal pieces

Plastic Shredded pieces

All less than 3 feet long.

approved 4/7/89

[illegible]

CONSTRUCTION DEBRIS DISPOSAL FORM

Name: Joe Vasquez **Organization:** maint

Date of Initial Use: N/A 2-27-89 vg

Date of Final Use: N/A 2-27-89 vg

Estimated Volume of Debris: 2 creates **cu. yds.** 1/2 cu. yds

Description of Debris (e.g., lumber, concrete, pipes, etc.):

Old creates