RESPONSES TO ENVIRONMENTAL PROTECTION AGENCY, REGION 2 COMMENTS ON THE *SENECA ARMY DEPOT ACTIVITY, NEW YORK DRAFT FINAL ENVIRONMENTAL BASELINE SURVEY REPORT* DATED OCTOBER 30, 1996

01571

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RESPONSES TO EPA COMMENTS

ENTITY: U.S. Environmental Protection Agency, Region 2

INDIVIDUAL: Jeanne M. Fox

TITLE: Regional Administrator

DATE: March 26, 1997

Comment A-1:

General

A substantial portion of SEDA is occupied by former munitions "storage" igloos. Except for those igloos noted below under the discussion of BRAC Parcel 3, EPA concurs with the Army's designation that the property occupied by these igloos is "uncontaminated." This concurrence is based on the representation by the Army in the EBS that this area was used only for the "storage" of munitions, and that there has been no documented disposal nor releases of hazardous substances or petroleum products within this area. Based on discussions with SEDA, it is EPA's understanding that munitions stored within the igloos were packaged in either asphalt impregnated fiber board, metallic or wooden containers, and strapped to wooden pallets.

Response:

Comment noted.

Comment A-2:

EPA is unable to concur that any of the structures identified in the EBS as having a potential for the release to the environment of lead based paint or asbestos are "uncontaminated." The Army has provided only limited information that such substances are possible or confirmed at certain locations, but no information has been provided as to their condition or possible release to the environment. This includes but is not limited to the housing units at Elliot Acres, Lake Housing, and "Colonels' Row." As the Army may provide a clarifying survey and/or sampling information on the condition of and possible releases (past and present) of these substances to the environment at these structures/properties, EPA will assist in recategorizing these structures/properties as appropriate.

Response:

A distinction is made between lead-based paint and other lead sources in the EBS report. A distinction is also made between asbestos-containing materials and raw asbestos. The approach used to identify and delineate the presence of lead-based paint and asbestos-containing materials has been developed by the Army, EPA, various states, and other regulatory agencies over the previous two rounds of base realignment and closure (1991 and 1993). Their presence has been documented in the EBS report; however, their presence does not necessarily preclude the Army from transferring or leasing the property. Prior to transfer or lease, a Finding of Suitability to Transfer of Lease (FOST of FOSL) will be prepared to determine whether, and how, to proceed.

The U.S. Army is making every attempt to provide disclosure of the presence of these materials. These materials will be dealt with to protect human health and the environment, as appropriate, prior to property transfer. It is important to note that "the government is required to provide disclosure" of the presence of lead-based paint "in accordance with the Residential Lead-Based Hazard Reduction Act of 1992 (Title X of Public Law 102-550) prior to the disposition of target housing to a non-government entity" (BCP Guidebook, Finding of Suitability to Transfer [FOST], Appendix B [DOD 1993]).

Unresolved issues will be forwarded with the Final EBS Report to the Office of the Deputy Assistant Secretary of the Army.

Comment A-3:

State spill records indicate that on October 5, 1987, a 3000 gallon fuel oil spill occurred, with some of it released to a Seneca Lake tributary. The exact location is not specified. EPA is unable to concur that any property that may have been impacted by this release is "uncontaminated."

Response:

The location of this spill was identified in the Final EBS Report and it corresponds with the locations of BRAC parcels 101(6)PS/PR/HS/HR and 136(4)PR in that report. This spill was State spill number 8705646 and it was closed out on November 5, 1997.

Comment A-4:

State spill records indicate that on November 19, 1992 a 1700 gallon fuel oil spill occurred at a tributary of Kendaia Creek. The exact location of this spill is not specified. EPA is unable to concur that any property that may have been impacted by this release is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 52(5)PR in that report. This spill was State spill number 9209672 and it was closed out on July 19, 1994.

Comment A-5:

State spill records indicate that on September 10, 1991, a gasoline spill was discovered while removing abandoned underground gasoline tanks. Eleven 55 gallon drums of contaminated soil were readied for disposal and groundwater was affected. The exact location is not specified. EPA is unable to concur that any property impacted by this release is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 96(6)PS/PR/HS/HR in that report. This spill was State spill number 9106276 and it was closed out on September 11, 1991.

Comment A-6:

State spill records indicate that on December 19, 1987, two 4000 gallon underground gasoline storage tanks failed tank tests. The exact locations are not specified. The spill records state that groundwater was affected. The tanks were removed on May 4, 1988. EPA is unable to concur that any property impacted by these releases is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 131(3)PS/PR/HS/HR in that report. This spill was State spill number 8708149 and it was closed out on May 4, 1988.

Comment A-7:

State spill records indicate that on September 22, 1988, a tank test failure was reported. The exact location is not specified. The tank contained JP 4 and three leaks were found in the piping. The piping was repaired and the retest resulted in failure again. The spill report states that groundwater was affected and on December 2, 1988 the tank was removed. EPA is unable to concur that any property impacted by this release is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 6(4)PS/PR in that report. This spill was State spill number 8805363 and it was closed out on December 2, 1988.

Comment A-8:

State spill records indicate that on March 23, 1992 fifteen gallons of jet fuel spilled onto the ground while refilling a helicopter. The exact location of this spill is not specified. EPA is unable to concur that any property impacted by this release is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 56(6)PR in that report. This spill was State spill number 9112997 and it was closed out on March 24, 1992.

Comment A-9:

State spill records indicate that on November 30, 1992, a contractor dug next to a transformer and knocked the transformer over. A 30 gallon spill of non-PCB oil went to the grass around Pole #A1-4-8. EPA is unable to concur that any property impacted by this release is "uncontaminated."

Response:

The location of this release was not identified in the Draft Final or Final EBS Reports. A parcel corresponding with this location indicating a petroleum release will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. This spill was State

spill number 9210155. All required cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on July 19, 1994. The new BRAC Parcel has been designated 143(2)PR.

Comment A-10:

State spill records indicate that on September 15, 1993, contaminated soil and groundwater were encountered while removing an underground tank. The exact location is not specified. Approximately 20 gallons of fuel oil had been released. EPA is unable to concur that any property impacted by this release is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 82(6)PS/PR/HS/HR in that report. This spill was State spill number 9307284 and it was closed out on April 2, 1997.

Comment A-11:

State spill records indicate that on April 4, 1994, a 200 gallon above ground fuel oil tank failed, causing 100 gallons to discharge to a drainage ditch where the oil was contained. The exact location is not specified. EPA is unable to concur that any property impacted by this release is "uncontaminated."

Response:

The location of this release was identified in the Final EBS Report and it corresponds with the location of BRAC parcel 104(6)PR/HS/HR in that report. This spill was State spill number 9400104 and it was closed out on March 1, 1995.

Comment A-12:

State spill records indicate that on January 30, 1996, 17 gallons of hydraulic oil were spilled at East Patrol Road and on February 27, 1996, 5 gallons of hydraulic oil were spilled into a drainage ditch. The exact locations of these releases are not specified. EPA is unable to concur that any property impacted by these releases is "uncontaminated."

Response:

The locations of both of these spills were not identified in the Draft Final or Final EBS Reports. Parcels corresponding with these locations indicating petroleum releases will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. All required cleanup actions have been taken at these sites and NYSDEC records indicate that the cases were closed on January 31, 1996 and March 11, 1996, respectively. State spill numbers 9513854 and 9515296, respectively, were assigned to these spills. The new BRAC Parcels have been designated 147(4)PR/HR and 146(4)PR/HR, respectively.

Comment A-13:

A portion of Sampson State Park is located adjacent to and upgradient of BRAC Parcel 1 and BRAC Parcel 5. Table 4-5 of the EBS states a leaking underground gasoline tank was discovered at Sampson State Park on March 1, 1990. The exact location of the release within the park is not specified. EPA is unable to concur that any SEDA property which may have been impacted by this release is "uncontaminated."

Response:

On October 1, 1997, personnel from Woodward-Clyde visited Sampson State Park in order to obtain more information concerning this release. Mr. Tony Pecoraro of the Finger Lakes Regional Office was also contacted and Mr. Pecoraro searched their files and forwarded information concerning this release to Woodward-Clyde. This additional information is included as Attachment 1. The NYSDEC spill report and remarks indicate that on March 1, 1990 a gasoline UST was found to be full of water. On April 3, 1990 the tank top was exposed and water was observed in the excavation, however, no sheen on the water was observed and no odor was noted in the soil that was removed. The tank was ultimately removed with no contamination encountered and the NYSDEC records indicate that the case is closed with no further action needed. Mr. Pecoraro indicated that this UST was located at the Sampson State Park maintenance building to the south of the main entrance. This location is over one mile southeast of the Lake Housing Area and is crossgradient of the U.S. Army property. A map showing the location of this UST is included as part of Attachment 1.

Comment A-14:

Potential Areas of Concern/Rumors List Analysis: With SEDA's April 11, 1995 letter, a list of potential areas of concern was compiled. In EPA's August 9, 1996 letter regarding Woodward-Clyde's Sampling Analysis Recommendations, we commented that the potential areas of concern/rumors list should be included in the Sampling Analysis Recommendations. EPA's concerns were addressed in the EBS with the exception of rumor numbers 4, 6, 8, 9 10, 11, 12, 14 and 17: EPA is unable to concur that these areas or any SEDA property which may have been impacted by these areas is "uncontaminated."

Response:

Concerning rumor number 4, conflicting information was obtained concerning the use of abandoned wells for waste disposal and specific locations could not be identified. No further effort will be addressed for this rumor unless new information is found.

Concerning rumor number 6, this rumor has been confirmed and a location for this activity has been identified that corresponds with BRAC parcel 138(7) in the Final EBS report.

Concerning rumor number 8, this rumor was not confirmed and no interviewees had any knowledge of the rumored activity. However, a potential location for this activity has been identified and this corresponds with BRAC parcel 140(7) in the Final EBS report.

Concerning rumor number 9, this rumor was not confirmed and no interviewees had any knowledge of the rumored activity. However, a potential location for this activity had been identified and this corresponds with BRAC parcel 139(7) in the Final EBS report.

Concerning rumor number 10, analysis of aerial photographs revealed no evidence of a pond in the reported area. No further effort will be addressed for this rumor unless new information is found.

Concerning rumor number 11, this rumor was not confirmed and no interviewees had any knowledge of the rumored activity. However, a potential location for this activity has been identified and this corresponds with BRAC parcel 109(7) in the Final EBS report.

Concerning rumor number 12, this rumor was not confirmed and no interviewees had any knowledge of the rumored activity. However, a former staging area has been identified in an aerial photograph and this area is within BRAC parcel 57(6)PS/PR/HR in the Final EBS report.

Concerning rumor number 14, this rumor has been confirmed and a location for this activity has been identified that corresponds with BRAC parcel number 137(7).

Concerning rumor number 17, this rumor has been confirmed and the location of this activity is part of the No Action SWMU SEAD-51. This rumor is associated with the use of herbicide treated soil for fill in the area of the high security fenceline. The use of herbicides along the high security fenceline has been investigated, and no further work is required in this area. Therefore, the inclusion of this area in BRAC parcel 3(1) is appropriate.

Comment A-15:

BRAC Parcel 1

EPA concurs with the Army's identification of "uncontaminated" property in Parcel 1 with the following exceptions:

EPA is unable to concur that Parcel 1 property downgradient of the above ground storage tank (AP-2 AST) is "uncontaminated." The EBS indicates that AP-2 AST has a large hole in its side and a large visible stain of petroleum product observed around its base. Although not on Army property, the tank is located hydraulically upgradient of and adjacent to Parcel 1.

Response:

We do not concur. This tank is not located adjacent to BRAC Parcel 1, it is located adjacent to BRAC Parcel 3, but downgradient from it. During the 1995 EBS visual inspection of this area no evidence was observed of migration of product onto the adjacent U.S. Army property. Based on surface drainage patterns in this area it is projected that groundwater flow in this area would be to the west-southwest and would, therefore, be crossgradient to BRAC Parcel 1.

Comment A-16:

EPA is unable to concur that Parcel 1 property downgradient of Trash Dump (AP-3) is "uncontaminated." Although not on Army property, the Army has not demonstrated that the trash dump does not include any hazardous substances or petroleum products and that no migration onto Parcel 1 has occurred.

Response:

On October 1, 1997, this site was visited by U.S. Army and Woodward-Clyde personnel. At that time it was determined that this site is actually on the U.S. Army property and a more thorough characterization of the site was made. It was noted that the materials clearly represent farm trash that was dumped at this location. Materials observed included: numerous pieces of milled lumber of various sizes, some of which were burnt; guttering; sheet metal; six empty 5-gallon buckets, one with a label indicating it had contained soap; 3 empty plastic bleach bottles; a bed spring; numerous aluminum soda or beer cans with the older type of pull-top; numerous soda bottles; a milk of magnesia bottle; several pig skulls with bullet holes; one goat skull; a few pieces of stove pipe; one 25-gallon rusted out drum; one 40-gallon rusted out drum; one 1-gallon can labeled 2-4-D Amine; a shoe; field fence; a tire; a 1-gallon thermos; a fabric softener bottle; various sized food jars; a plastic mustard squeeze bottle; and one shingle. The trash dump extends about 200 feet from the northern edge of the top the Kendaia Creek ravine south down the steep slope of the ravine to the flat area at the bottom, and for about 100 feet east to west at its widest point. The deposits appear to the result of a single dumping event, with the materials dumped at the top of the ravine and then spread out due to gravity. Based on the depositional nature of the site, the types of materials present, and the observation of moss growing on some of the materials, it is estimated that these materials were dumped there approximately 10 to 20 years ago.

Although it appears that these materials have been here for several years and that the cans and drums were probably empty when disposed of, the U.S. Army is nonetheless concerned about this site. Therefore, a one-quarter acre category 7 parcel corresponding to this location will be added to the Version 2 BRAC Cleanup Plan Report. The new BRAC Parcel has been designated 149(7).

Comment A-17:

BRAC Parcel 2

EPA concurs with the Army's identification of "uncontaminated" property in Parcel 2 with the following exceptions:

EPA is unable to concur that areas where aircraft fueling or chemical de-icing operations were conducted or any property that may have been impacted by these areas are "uncontaminated."

Response:

BRAC guidance indicates that entire airfields should not be excluded from Category 1 on the basis that they are airfields, alone. Unless evidence exists of storage, release, or disposal, airfields should not be excluded from Category 1. However, the U.S. Army has agreed to investigate three additional areas at the Airfield where fueling operations were regularly conducted. The EBS investigations found no evidence that de-icing operations ever took place at the Airfield.

Comment A-18:

EPA is unable to concur that the portion of this parcel that the *Seneca Army Depot Land Use & GSA Outside Stock Commodities Map* (February 1992) delineates as Training Ranges is "uncontaminated." This area includes but is not limited to BRAC parcel 114Q-X, a firing range.

Response:

We do not concur. Property that was used as intended for military training or operations in which residual UXO, ordnance fragments, and/or explosive materials are present or may be present has been identified and documented in the EBS report. The U.S. Army is actively implementing a UXO program. Prior to transfer or lease, a FOST or FOSL will be prepared to determine whether, and how, to proceed.

Comment A-19:

EPA is unable to concur that BRAC Parcel 115Q-X, a skeet range, is "uncontaminated."

Response:

See response to comment A-18.

Comment A-20:

State spill records indicate that a prior UST located at building 2310 leaked jet fuel and was removed. State records also report a jet fuel spill from a tanker truck at building 2305. EPA is unable to concur that any property impacted by these releases is "uncontaminated."

Response:

Concerning the release at Building 2310, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 6(4)PS/PR in that report. State spill number 9402116 was assigned to this spill and it was closed out on May 12, 1994.

Concerning the release at Building 2305, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 8(4)PS/PR. State spill numbers 9011429, 9100721, and 9411405 were associated with this site. These spills were closed out on January 30, 1991, April 18, 1991, and November 26, 1994, respectively.

Comment A-21:

BRAC Parcel 3

EPA concurs with the Army's identification of "uncontaminated" property in Parcel 3 with the following exceptions:

EPA is unable to concur that any of the parcels or buildings listed in *Table 5-3 Potential UXO Hazards* with the descriptions "storage for disposal", "possible surface or buried UXO", "potential for UXO fragments," "potential firing of explosive ordnance" are "uncontaminated."

Response:

We do not concur. Property that was used as intended for military training or operations in which residual UXO, ordnance fragments, and/or explosive materials are present or may be present has been identified and documented in the EBS report. The U.S. Army is actively implementing a UXO program. Prior to transfer or lease, a FOST or FOSL will be prepared to determine whether, and how, to proceed.

Comment A-22:

EBS *Section 4.4.6 Radionuclides* states that a decommissioning survey was performed on 64 Special Weapons Area ammunition igloos to confirm that the igloos have no radiation contamination. The survey was conducted because these igloos have been used for the storage of special weapons. The EBS then states that no fixed or removable radiological contamination was found that exceeded regulatory guidelines and requirements at these surveyed sties. Excerpts provided by the Army on March 17, 1997, from a July 14, 1993 report, entitled

"Decommissioning Survey, Seneca Army Deport (SEAD), Romulus, NY" indicate that the survey was conducted to meet Nuclear Regulatory Commission Guidelines for Decommissioning of Facilities and Equipment Prior to Release for Unrestricted Use; however, only 56 of the 64 igloos were surveyed. The remaining igloos were in use and unavailable for survey. However, the information provided does not identify which of the 64 igloos were surveyed and which were unavailable. EPA is therefore unable to concur that any property which may have been impacted by these 64 storage igloos is "uncontaminated." As the Army may provide clarifying survey information (e.g., the full 1993 report with appendices), EPA will assist in recategorizing these structures/properties as appropriate.

Response:

In 1994, a follow-up decommissioning survey of the eight remaining storage igloos was performed using the same protocols as those in the 1992 to 1993 survey. As a result of this survey, no fixed or removable radiological contamination was found at the surveyed sites that exceeded regulatory guidelines and requirements. This survey concluded that these remaining eight storage bunkers may be released for unrestricted use. A copy of the report for the 1994 decommissioning survey has been included as Attachment 2.

Comment A-23:

SEDA has also qualified for Radionuclides 96 additional storage igloos which the Army has indicated are scheduled to be surveyed before transferring the property. EPA is unable to concur that any property which may have been impacted by these 96 storage igloos is "uncontaminated." As the Army may provide clarifying survey information, EPA will assist in recategorizing these structures/properties as appropriate.

Response:

The U.S. Army will provide the EPA with the results of radiological surveys at the identified storage igloos as they become available.

Comment A-24:

EPA is unable to concur that any part of the North Depot Area is "uncontaminated." The boundaries of this area are defined as the SEDA property line to the north, high security fence line to the east, and south, and North Patrol Road to the southwest. The area is surrounded on

three sides by BRAC Parcels 104(6)PR/HS/HR and 98(6)PS/HS/HR where hazardous substances have been released and further investigations are scheduled to characterize the extent of contamination, but no remediation has been initiated. In addition, state spill records indicate that spills have occurred within the North Depot area.

Response:

The potential areas of concern in the North Depot Area in the Draft Final EBS Report were expanded in the Final EBS Report. They are now identified as being bounded by the high security fence on the north, east, and southwest and the first row of storage igloos on the south. It is the position of the U.S. Army that this area as defined is the area of concern as agreed to by the EPA and NYSDEC concerning the identified SWMUs SEADs-12 and 63. This area as defined corresponds with BRAC parcels 53(5)HR, 98(6)PS/PR/HS/HR, and 103(6)HR in the Final EBS Report.

Concerning the spills reported in the North Depot Area, all of these cases through 1996 are considered closed by the NYSDEC. No further remedial actions are required and the properties should be considered uncontaminated.

Comment A-25:

The *Seneca Army Depot Land Use & GSA Outside Stock Commodities Map* (February 1992) shows a silicon carbide ore pile off of West Kendaia Road and west of buildings 2200 and 2201. EPA is unable to concur that the property in the vicinity of this storage area is "uncontaminated."

Response:

During the EBS process, the various open ore storage piles at SEDA were assessed for their potential for the release of hazardous materials to the environment. At that time, several of the ore types were identified as being potentially toxic and having the potential to be released to the environment. In the case of silicon carbide ore it was determined that the material itself is non-toxic.

Additionally, a study by the Defense National Stockpile Center to determine the actual characteristic leaching potential of silicon carbide and other materials has been conducted (*A Study of the Characteristic Leaching Potential of Defense National Stockpile Ores, Minerals, and Alloys*, undated report). The results of this study indicated that the degree of leaching for

all of the materials studied fell well within prescribed EPA levels for the heavy metals of concern even under the "worst case scenario" situation. The specific results for silicon carbide were even lower then many of the other materials analyzed. Therefore, the Category 1 designation for this ore pile is appropriate. A copy of the report is included as Attachment 3.

Comment A-26:

EPA is unable to concur that BRAC Parcels 117Q-X (suspected ammunition burial/disposal area) and 119Q-X (suspected small arms range) are "uncontaminated."

Response:

We do not concur. Property that was used as intended for military training or operations in which residual UXO, ordnance fragments, and/or explosive materials are present or may be present has been identified and documented in the EBS report. The U.S. Army is actively implementing a UXO program. Prior to transfer or lease, a FOST or FOSL will be prepared to determine whether, and how, to proceed.

Comment A-27:

Upgradient of Army property, approximately at "CERFA" map location 4,19, a leaking underground petroleum tank is identified in Table 4-5 of the EBS. The release discovery date is September 17, 1993. EPA is unable to concur that any Army property downgradient of this tank which may have been impacted by this release is "uncontaminated."

Response:

Table 4-5 in the Final EBS Report contains an error concerning this leaking underground storage tank. The actual discovery date was November 15, 1994, however, the remaining information in the table concerning this incident is accurate. Additional information concerning this release was obtained from NYSDEC and is included as Attachment 4. The correspondence included with this information indicates that the situation has been corrected and that the case is closed. If evidence had been found during the investigation of this release that adjacent properties were impacted, additional cleanup or investigation would have been required by NYSDEC. Therefore, it can be concluded that this incident has had no impact on U.S. Army property.

Comment A-28:

EPA is unable to concur that BRAC Parcel 122Q-X is "uncontaminated." This area is also known as SEAD-46, Small Arms Range, which is scheduled to be investigated through the RI/FS process.

Response:

We do not concur. Property that was used as intended for military training or operations in which residual UXO, ordnance fragments, and/or explosive materials are present or may be present has been identified and documented in the EBS report. The U.S. Army is actively implementing a UXO program. Prior to transfer or lease, a FOST or FOSL will be prepared.

Comment A-29:

State spill records indicate fuel oil spills occurred at building 103 (BRAC Parcel 23(2)PS) and building 118 (BRAC Parcel 24(2)PS/HS) and a diesel spill occurred at building 129 (BRAC Parcel 29(2)PS). EPA is unable to concur that these parcel are "uncontaminated."

Response:

Concerning the release at Building 103, the location of this release was not identified in the Draft Final or Final EBS Reports. BRAC Parcel 23(2)PS will be changed to indicate that a petroleum release occurred at this location in the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. All required cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on June 21, 1988. State spill number 8706958 is associated with this site.

Concerning the release at Building 118, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 24(3)PS/PR/HR. State spill number 9204312 was assigned to this site and it was closed on July 15, 1992.

Concerning the release at Building 129, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 29(3)PS/PR. State spill number 9402116 was assigned to this spill and it was closed out on May 12, 1994.

Comment A-30:

A Seneca County Highway Department (AP-1) facility is located upgradient of Army property near its eastern boundary approximately at CERFA map location 17, 24. This facility is

described in the EBS as a heavy equipment and maintenance yard and shop with numerous USTs and ASTs in various states of neglect and disrepair. Spill records in Appendix B of the EBS indicate a tank failure/gasoline spill occurred which impacted groundwater at this facility. The EBS states that this property should be environmentally characterized for potential soil and groundwater contamination. EPA is unable to concur that any Army property which may have been impacted by this facility is "uncontaminated."

Response:

No evidence was observed during the 1995 EBS visual inspection of this adjacent property to indicate that any product ever migrated to the U.S. Army property. Furthermore, the problems observed at the source area can be characterized as poor housekeeping, and although there appears to have been releases, they also appear to be minor in extent. Therefore the potential for the site to have affected adjacent SEDA property is small.

Concerning the reported tank failure, this occurred in 1987 and according to the state records the cleanup is complete and the case is closed. If evidence had been found during the investigation of this release that adjacent properties were impacted, additional cleanup or investigation would have been required by NYSDEC. Therefore, it can be concluded that this incident has had no impact on U.S. Army property.

Comment A-31:

Table 4-5 of the EBS indicates that upgradient of SEDA property, at approximate CERFA map location 17,25, a leaking underground fuel oil tank was discovered March 7, 1991. EPA is unable to concur that Army property which may have been impacted by this tank is "uncontaminated."

Response:

Although the location of this release is within the prescribed radius for the records searches, it is approximately one-mile from the installation boundary. The state records indicate that 20 gallons of fuel oil were released affecting soil but not groundwater. Furthermore, the table incorrectly states that this location is located upgradient from the U.S. Army property; it is actually located downgradient from the U.S. Army property. Additionally, the state records indicate that the cleanup is complete and the case is closed. If evidence had been found during the investigation of this release that adjacent properties were impacted, additional cleanup or

investigation would have been required by NYSDEC. Therefore, it can be concluded that this incident has had no impact on U.S. Army property.

Comment A-32:

State spill records indicate that fuel oil spills occurred at or in the vicinity of buildings 212 and 214. EPA is unable to concur that property in the vicinity of these releases/buildings is "uncontaminated."

Response:

Concerning the release at Building 212, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 135(4)PS/PR. State spill number 8910053 was associated with this site and it was closed out on December 19, 1990.

Concerning the release at Building 214, the location of this release was not identified in the Draft Final or Final EBS Reports. A parcel corresponding with this location and indicating a petroleum release will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. All required cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on April 2, 1997. State spill number 9203242 was assigned to this site and it was closed out on April 2, 1997. The new BRAC Parcel has been designated 145(2)PS/PR.

Comment A-33:

State spill records indicate that a methylene chloride spill occurred associated with building 323. EPA is unable to concur that property in the vicinity of this release/building is "uncontaminated."

Response:

Concerning the release at Building 323, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 17(3)HS/HR. State spill number 9112897 was associated with this site and it was closed out on March 18, 1992.

Comment A-34:

State spill records indicate that DS2, a caustic cleaner containing diethylene triamine and ethylene glycol methyl ether, was spilled at building 329. EPA is unable to concur that property in the vicinity of this release/building is "uncontaminated."

Response:

This release consisted of 2.5 gallons of DS-2 that were spilled on September 10, 1992 inside of a railroad boxcar that was being offloaded into Building 329. The spill was confined to the inside of the boxcar and the material was not released to the environment. Therefore, the designation of this parcel as uncontaminated is appropriate.

Comment A-35:

State spill records indicate that a DS2 spill occurred at building 330. In addition, a waste oil spill occurred south of building 330. EPA is unable to concur that property in the vicinity of these releases/building is "uncontaminated."

Response:

Concerning the DS2 released at Building 330, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 13(3)HS/HR. State spill number 9306000 was assigned to this spill and it was closed out on July 19, 1994.

Concerning the waste oil release south of Building 330, the location of this release was not identified in the Draft Final or Final EBS Reports. A parcel corresponding with this location and indicating a petroleum release will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. All required cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on August 31, 1993. State spill number 9306648 was assigned to this spill. The new BRAC Parcel has been designated 148(4)PR/HR.

Comment A-36:

State spill records indicate that a diesel fuel spill occurred at building 342 affecting soil. EPA is unable to concur that property in the vicinity of this release/building is "uncontaminated."

Response:

The location of this release was not identified in the Draft Final or Final EBS Reports. A parcel corresponding with this location and indicating a petroleum release will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. All requested cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on August 1, 1996. State spill number 9601515 was associated with this site. The new BRAC Parcel has been designated 144(2)PR.

Comment A-37:

State spill records indicate that hydraulic fluid spills occurred around the perimeter of building 349 and behind C-509 IGLOO. EPA is unable to concur that property in the vicinity of these releases/buildings is "uncontaminated."

Response:

Concerning the release at Building 349, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 130(3)PR/HR(P). State spill number 9109685 was associated with this spill and it was closed out on December 10, 1991.

Concerning the release at Igloo C-509, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 132(3)PR/HR(P). State spill number 9206638 was assigned to this spill and it was closed out on September 8, 1992.

Comment A-38:

Spill records in Appendix B of the EBS indicate that fuel oil and gasoline spills occurred associated with building 357 and that the cases remain open. State spill records indicate that DS2 spilled at this building. EPA is unable to concur that property in the vicinity of these releases/building is "uncontaminated."

Response:

We concur with the general comment that spills of petroleum products and DS-2 have occurred at Building 357. Concerning these releases, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 131(3)PS/PR/HS/HR. State spill number 8708149 was associated with this site and it was closed out on May 4, 1988.

Concerning the comment that Appendix B indicates a spill at Building 357 and that the case remains open, we do not concur. On pages 8 and 9 of the Vista National Radius Profile portion of Appendix B, two cases are listed as being associated with Building 357. This is incorrect. The second case, dated March 27, 1992, is actually associated with Building 2411. Please see the response to comment number 42 which addresses Building 2411.

Comment A-39:

The *Seneca Army Depot Land Use & GSA Outside Stock Commodities Map* (February 1992) shows a silicon carbide ore pile on 8th Street across from building 350. EPA is unable to concur that the property in the vicinity of this storage area is "uncontaminated."

Response:

During the EBS process, the various open ore storage piles at SEDA were assessed for their potential for the release of hazardous materials to the environment. At that time, several of the ore types were identified as being potentially toxic and having the potential to be released to the environment. In the case of silicon carbide ore it was determined that the material itself is non-toxic. Therefore, the Category 1 designation for this ore pile is appropriate.

Additionally, a study by the Defense National Stockpile Center to determine the actual characteristic leaching potential of silicon carbide and other materials has been conducted (*A Study of the Characteristic Leaching Potential of Defense National Stockpile Ores, Minerals, and Alloys*, undated report). The results of this study indicated that the degree of leaching for all of the materials studied fell well within prescribed EPA levels for the heavy metals of concern even under the "worst case scenario" situation. The specific results for silicon carbide were even lower then many of the other materials analyzed. Therefore, the Category 1 designation for this ore pile is appropriate. A copy of the report is included as Attachment 3.

Comment A-40:

Spill records in Appendix B of the EBS indicate a diesel spill occurred at Loran Station C. EPA is unable to concur that property in the vicinity of this release is "uncontaminated."

Response:

Concerning the release at the LORAN Station, this area has been identified in the Final EBS Report and it corresponds with BRAC parcel 44(3)PR/HR. State spill number 9306216 was assigned to this site and it was closed out on August 19, 1993.

Comment A-41:

BRAC Parcel 4

EPA concurs with the Army's identification of "uncontaminated" property in Parcel 4 with the following exception:

State spill records indicate that adjacent to this parcel, a petroleum spill occurred in the vicinity of buildings 212 and 214. Parcel 4(1) may be downgradient of this release. EPA is unable to concur that Parcel 4(1) property downgradient of this release is "uncontaminated."

Response:

The cases referenced located adjacent to Parcel 4 have been investigated by the U.S. Army. All cleanup actions have been taken and they are closed. If contamination had been discovered that extended into Parcel 4, additional cleanup actions would have been required by NYSDEC. Therefore, it can be concluded that these releases have had no impact on this parcel. See comment A-32 and the response.

Comment A-42:

BRAC Parcel 5

EPA concurs with the Army's identification of "uncontaminated" property in Parcel 5 with the following exception:

State spill records indicate that fuel oil releases have occurred at buildings 2411, 2448 and 2452. EPA is unable to concur that property in the vicinity of these releases/buildings is "uncontaminated."

Response:

Concerning the release at Building 2411, the location of this release was not identified in the Draft Final or Final EBS Reports. A parcel corresponding with this location and indicating a petroleum release will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA

letter report will be revised. All required cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on May 24, 1994. State spill number 9113164 was associated with this site. The new BRAC Parcel has been designated 141(2)PS/PR.

Concerning the release at Building 2448, the location of this release was not identified in the Draft Final or Final EBS Reports. A parcel corresponding with this location and indicating a petroleum release will be added to the Version 2 BRAC Cleanup Plan Report and the CERFA letter report will be revised. All required cleanup actions have been taken at this site and NYSDEC records indicate that the case was closed on July 19, 1994. State spill number 9106466 was assigned to this spill. The new BRAC Parcel has been designated 142(2)PS/PR.

Concerning the release at Building 2452, this area was identified in the Final EBS Report and it corresponds with BRAC parcel 133(4)PS/PR. State spill number 9204266 was assigned to this spill and it was closed out on July 19, 1994.

Comment A-43:

It is our understanding that the EBS is to be a "living document;" namely that, based on new information, the EBS will be updated periodically. Therefore, as additional information regarding property and underlying groundwater may be provided by the Army, EPA will assist in recategorizing property as appropriate.

Response:

We do not concur. The EBS, which is intended to establish environmental baseline conditions at the time of the survey, is not a "living document" in that it will not be revised beyond the final report which was issued on March 3, 1997. However, the *BRAC Cleanup Plan (BCP) Report* which was issued in October, 1996, and contains a summary of the environmental condition of property, will be updated periodically. Revisions of the BCP report will reflect new information on environmental condition of property as a result of additional investigations or ongoing remedial actions.

Comment A-44:

Please note that documentation as to the identification of "uncontaminated" property must be made available to the public as required by Section 120(h)(4) of CERCLA.

Response:

Comment noted.

CERFA Table 1
BRAC ACREAGE SUMMARY TABLE
SENECA ARMY DEPOT ACTIVITY, NEW YORK

ENVIRONMENTAL CONDITION CATEGORY NUMBER	TOTAL ACREAGE	ACREAGE MINUS QUALIFIED ACREAGE	TOTAL QUALIFIED ACREAGE	ACM-QUALIFIED ACREAGE	LBP-QUALIFIED ACREAGE	PCB-QUALIFIED ACREAGE	RADON-QUALIFIED ACREAGE	UXO-QUALIFIED ACREAGE	RADIONUCLIDE-QUALIFIED ACREAGE
1	8,663.94	8,554.45	109.49	52.12	56.84	0.02	0.38	55.82	7.38
2	20.26	19.17	1.09	0.27	1.09	0.00	0.00	0.00	0.00
3	19.15	1.44	17.71	17.66	17.62	0.00	0.00	2.11	0.00
4	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	201.31	111.86	89.45	0.07	0.07	0.00	0.00	0.07	89.18
6	1,715.49	128.65	1,586.84	2.69	6.44	0.00	0.00	1,244.80	341.48
7	13.10	13.01	0.09	0.09	0.09	0.00	0.00	0.00	0.00
Total	10,634	8,829.33	1,804.67	72.90	82.15	0.02	0.38	1,303.34	438.04

Note: Acreage figures are approximate; they have been calculated using AutoCad Release 12.

CERFA Table 2a
BRAC PARCEL DESCRIPTIONS
SENECA ARMY DEPOT ACTIVITY, NEW YORK

	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	
	18,6	189.10	Lake Housing Area	1	No record of storage, disposal, release, or migration	Visual Inspection, Interview	N
	26,10	494.71	Airfield Area	1	No record of storage, disposal, release, or migration	Visual Inspection, Interview	N
	16,15	7,869.97	Depot Wide	1	No record of storage, disposal, release, or migration	Visual Inspection, Interview	N
	19,24	1.16	Circa 1 acre in Elliot Acres	1	No record of storage, disposal, release, or migration	Visual Inspection, Interview	N
	17,2	61.88	Lake Housing Area	1	Building 2485 - fuel oil storage	21	N
	28,10	0.25	Airfield Area	2	Building 2310 - JP8 UST reported leaking in 1988	21, LUST list	R h
	28,10	0.25	Airfield Area	1	Building 2306 - fuel oil UST	21	N
	28,10	0.25	Airfield Area	2	Building 2305 spills - fuel oil UST reported leaking in 1989	21, Spill list	R h
	30,23	1.68	Main Depot Area	1	Acid storage	Visual Inspection, Interview	N
	28,26	0.25	LORAN-C Area	1	Fuel oil storage	21	N
	24,22	2.02	Warehouse Area	1	Building 327 - pesticide, soda ash, antifreeze	Interview	N
	24,22	2.02	Warehouse Area	1	Building 326 - STB and chlorine impregnate storage	Interview	N
	23,22	2.02	Warehouse Area	3	Building 330 - pesticide, soda ash, antifreeze storage; spill reported in 1993	Interview, Spill list	R ha
	22,22	2.02	Warehouse Area	3	Building 331 - Pesticide, soda ash, antifreeze storage; spill reported in 1992	Interview, Spill list	R ha

CERFA Table 2a
(Continued)

LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	R
22,22	2.02	Warehouse Area	1	Building 324 - columbite ore storage	1	No
22,23	2.02	Warehouse Area	1	Building 343 - pesticide, soda ash, antifreeze	Interview	No
22,22	2.02	Warehouse Area	3	Building 323 - pesticide, soda ash, antifreeze; spill reported in 1992	Interview, Spill list	Re ha
21,22	0.67	Warehouse Area	1	Building 333 - STB, DS-2, solvents	Interview	No
21,22	0.06	Warehouse Area	3	Building 307 (SEAD-1) - hazardous waste storage; spill reported in 1991	1, Spill list	Re ha
21,21	6.87	IPE Area	1	Buildings 316, 317, 318, and 372 - IPE - solvents, petroleum products	Interview	No
20,23	26.29	Elliot Acres Housing Area	1	Fuel oil storage	0.25-acre tank spacing, 21	No
19,23	0.25	South Depot Area	1	Building 101 - fuel oil storage	21	No
18,23	0.25	South Depot Area	2	Building 103 - fuel oil storage, fuel oil spill	21, Spill list	No
19,23	0.47	South Depot Area	2	Building 118 (SEAD-30) - auto shop, waste oil UST, Building 120 - gas station; spill reported in 1992	1, Spill list	Re ha
19,23	0.41	South Depot Area	1	Building 117, Heavy Equipment Shop - waste oil storage UST (SEAD-31)	1	No
19,22	0.16	South Depot Area	1	Building 125 - former paint shop	Interview, 21	No
18,23	0.25	South Depot Area	1	Building 106 - health clinic, fuel oil storage	Interview, 21	No
18,22	0.25	South Depot Area	1	Building 114 - USTs	21	No
19,21	0.25	South Depot Area	2	Building 129 - fuel oil storage; spill reported in 1994	21, Spill list	No
18,21	0.25	South Depot Area	1	Building 113 - fuel oil storage	21, Spill list	No

CERFA Table 2a
(Continued)

	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	
	20,21	0.25	Main Depot Area	1	Building 312 (General Supply) - hydrofluosilic acid, paint, antifreeze, turpentine, diesel oil	Interview	No
	2,15	0.25	North Depot Area	1	Building 800 - fuel oil storage	21	No
	2,15	0.25	North Depot Area	1	Building 729 - fuel oil storage	21	No
	3,14	0.25	North Depot Area	1	Buildings 719, 721, and 720 - gas station, vehicle maintenance	Visual Inspection	No
	2,14	0.25	North Depot Area	1	Building 733 - fuel oil storage	21	No
	3,14	0.25	North Depot Area	1	Building 746 - fuel oil storage	21	No
	3,12	0.25	North Depot Area	2	Building 710 - fuel oil storage reported leaking in 1989	21, LUST list	Re hav
	2,12	0.71	North Depot Area	1	Building 742 - gas station	Visual Inspection	No
	2,12	0.25	North Depot Area	1	Building 714 - fuel oil storage	21	No
	2,12	0.25	North Depot Area	1	Building 740 - fuel oil storage	21	No
	14,9	0.25	Main Depot Area	1	Acid storage (SEAD-65A)	1	No
	14,9	0.25	Main Depot Area	1	Acid storage (SEAD-65B)	1	No
	14,9	0.25	Main Depot Area	1	Acid storage (SEAD-65C)	1	No
	29,26	0.25	LORAN-C Area	3	Halon and diesel spills	Interview, Spill list	Re hav
	27,25	4.65	Warehouse Area	3	Building 356 (SEAD-49) - columbite ore storage, DS-2 storage/spills	1, 20	No
	18,21	0.96	South Admin Area	3	Wood burn ash, pressure-treated wood (SEAD-10)	1	No
	2,14	1.46	North Depot Area	2	Building 732 (SEAD-29) - auto hobby shop, waste oil storage	1	No

CERFA Table 2a
(Continued)

	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	RI
	22,12	112.67	Main Depot Area	5	Non-combustible landfill (SEAD-8), incinerator cooling water pond (SEAD-3), ash landfill (SEAD-6), refuse burning pits (SEAD-14), solid waste incinerator (SEAD-15), disposal area west of Building 2203 (SEAD-64D)	1, 19	Surf rem
	29,19	72.54	Main Depot Area	5	Pitchblende storage and release (SEAD-48)	1	Pen
	21,22	0.06	IPE Area	5	Boiler blowdown leach pit (SEAD-40), waste oil storage (SEAD-34), boilers at Building 319 (SEAD-37), UST reported leaking in 1994, spills reported in 1994	1, LUST list, Spill list	Pen
?)	21,21	0.25	IPE Area	5	Building 360 - waste oil storage (SEAD-28), spill, steam Jenny (SEAD-27).	1	Pen
	19,23	5.49	Main Depot Area	2	Spill from Building 138, partially clean	Interview, LUST list	Pen
	3,17	15.79	Special Weapons Area	5	Radioactive waste burial (SEAD-12A)	1, 18	Pen
	16,2	0.25	Lake Housing Area	6	Pump house Building 2409 - sewage release on east side of building	Visual Inspection, Interview	Non
	18,11	1.88	Main Depot Area	6	Abandoned powder burning area (SEAD-24)	1, 16	Non
	29,12	7.43	Airfield Area	2	Fuel spills west of Building 2312	Interview, Spill list	Non
	32,17	178.84	Main Depot Area	6	Fuel oil storage, old construction debris landfill (SEAD-11), munitions washout plant (SEAD-4), boiler pit blowdown leach pit at Building 2079 (SEAD-38), leaking tank reported at Building 2079 in 1993, spill reported at Building 2073 in 1992, dumping	1, 16, 17, LUST list, Spill list, Interviews, Visual Inspection	Non
	31,19	8.60	Main Depot Area	6	Garbage disposal area (SEAD-64B)	1, 19	Non

CERFA Table 2a
(Continued)

	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	
	31,22	7.57	Main Depot Area	6	Buildings 608 and 612 (SEAD-52) - ammunition breakdown area, oil discharge adjacent to Building 609 (SEAD-60), fuel oil storage	1, 19	N
	32,23	3.72	Main Depot Area	6	Material proof and surveillance test area west of Building 616 (SEAD-44A)	1, 18	N
	30,22	1.62	Main Depot Area	6	Material proof and surveillance test area on Brady Road (SEAD-44B)	1, 18	N
	31,23	1.82	Main Depot Area	6	Nicotine sulfate disposal area near Buildings 606 and 612 (SEAD-62)	1, 18	N
	30,25	10.00	Main Depot Area	6	Building 606 - Old Missile Propellant Test Laboratory (SEAD-43), disposal area (SEAD-69), herbicide and pesticide storage (SEAD-56), UST at Building 606	1, 18	N
	25,22	1.77	Main Depot Area	6	Debris landfill with raw asbestos (SEAD-64A)	1, 19	N
	25,22	1.39	Warehouse Area	6	Open zinc ore pile	Visual Inspection	N
	26,22	9.26	Warehouse Area	6	Fire training pit (SEAD-26)	1, 16	N
	26,22	0.89	Warehouse Area	6	Open chromite ore pile	Visual Inspection	N
	25,22	0.65	Warehouse Area	6	Open aluminum oxide ore pile	Visual Inspection	N
	26,24	0.55	Warehouse Area	6	Open antimony ore pile	Visual Inspection	N
	26,25	1.55	Warehouse Area	6	Open ferro chrome ore pile	Visual Inspection	N
	26,25	0.81	Warehouse Area	6	Open antimony ore pile	Visual Inspection	N
	25,24	19.94	Tank Farm	6	Storage tanks for antimony, rutile, asbestos and silicon carbide (SEAD-50, SEAD-54)	1, 18	N
	24,23	1.56	Warehouse Area	6	Open chromite ore pile	Visual Inspection	N

CERFA Table 2a
(Continued)

LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	RE M
24,22	0.74	Warehouse Area	6	Open ferro manganese ore pile	Visual Inspection	None
23,23	1.94	Warehouse Area	6	Open chromite ore pile	Visual Inspection	None
22,23	0.75	Warehouse Area	6	Open ferro manganese ore pile	Visual Inspection	None
23,22	0.49	Warehouse Area	6	Spill of PCB oil north of Building 325	Interview	None
21,21	3.08	Main Depot Area	6	Interviews revealed dumping of hazardous materials at DRMO yard	Interview	None
20,22	2.82	Main Depot Area	6	Fire training pad (SEAD-25)	1, 16	None
20,20	1.93	Main Depot Area	6	Building 367 (SEAD-17) - deactivation furnace, AST	1, 16	None
19,21	0.43	Main Depot Area	6	Sewage sludge waste piles (SEAD-5)	1, 18	None
19,21	4.47	Main Depot Area	6	Building S-311 (SEAD-16) - deactivation furnace, Building S-361 - raw material storage yard; spill reported at Building S-311 in 1993	1, 16, Visual Inspection, Spill list	None
19,19	1.41	Main Depot Area	6	Open chromite ore pile	Visual Inspection	None
18,19	1.16	Main Depot Area	6	Buildings 308, 306 - Boiler House, Inspector's Workshop, staining	Visual Inspection	None
19,21	0.69	USE Area	6	Fill area with unknown contents west of Building 135 (SEAD-59)	1, 18	None
19,22	0.11	South Depot Area	6	Building 135 - vehicle storage building with stained soil	Visual Inspection	None
19,23	0.25	South Depot Area	6	Building 121 (SEAD-36) - waste oil tank (SEAD-33), boiler plant blowdown leach pit (SEAD-39), boiler plant	1	None
19,22	0.14	South Depot Area	2	UST at Building 127 with stained soil	Visual Inspection	None
18,22	1.16	South Depot Area	6	Alleged paint/solvent disposal area (SEAD-71)	1, 19	None

CERFA Table 2a
(Continued)

	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	
	17,22	2.07	Duck Ponds Area	6	Old scrap wood (SEAD-9)	1, 18	N
	17,19	0.98	Main Depot Area	6	Open chromite ore pile	Visual Inspection	N
	16,19	4.62	Main Depot Area	6	Pesticide storage - Buildings 5 and 6 (SEAD-66)	1	N
	16,19	0.91	Main Depot Area	6	Open aluminum oxide ore pile	Visual Inspection	N
	16,20	5.12	Duck Ponds Area	6	Sewage Treatment Plant No. 4 (SEAD-20), dump site to east (SEAD-67)	1, 19	N
	16,19	0.49	Main Depot Area	6	Open ferro manganese ore pile	Visual Inspection	N
	11,19	10.07	Duck Ponds Area	6	IRFNA disposal site (SEAD-13)	1, 17	N
	11,20	8.81	Duck Ponds Area	6	IRFNA disposal site (SEAD-13)	1, 17	N
	4,17	334.79	Special Weapons Area	6	Buildings 813-817 - paints, boiler pits, petroleum release, tritium release, unknown burial activities Radioactive waste burial north of Buildings 804 and 805 (SEAD-12B), mixed waste storage at Building 803 (SEAD-72), incinerator and Building 810 (SEAD-19), USTs at Buildings 802 and 805 Leaking tank at Building 806 reported in 1989; leaking tank at Building 807 reported in 1991 Unknown contents/unknown storage at Building 810 Unknown activities/storage at Building 819, igloos A0101 and A0102	Visual Inspection, Interview, 1, 18, Spill list, LUST list	N

CERFA Table 2a
(Continued)

LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	RI
3,15	0.25	Special Weapons Area	2	Former MP gas station (removed tank)	Visual Inspection, Interview	Non
3,14	0.85	North Depot Area	6	Building 747 - unknown contents/unknown storage; spill reported in 1992	Interview, Spill list	Non
3,13	0.08	North Depot Area	6	Building 718 - waste oil tank (SEAD-32, SEAD-61), waste oil-burning boilers (SEAD-35), boiler blowdown leach pit (SEAD-41); spill reported in Building 718 in 1994	1, Spill list	Non
3,13	1.52	North Depot Area	2	Buildings 716-717 - fuel oil filling and storage station, auto hobby shop, stained soil	Visual Inspection, Interview	Non
5,13	3.64	Special Weapons Area	6	Miscellaneous components burial area (SEAD-63)	1, 19	Non
5,9	1055.65	Main Depot Area	6	Open burning (SEAD-23), open detonation (SEAD-45), explosive ordnance disposal (SEAD-57), filled area at Building T-2110 (SEAD-70), training area, spills reported at Open Burning and Open Detonation Grounds in 1994; spill reported at Building 2134 in 1995	1, 16, Visual Inspection, Interview, Spill list, LUST list	Non
15,13	1.95	Main Depot Area	6	Aluminum oxide ore pile		Non
17,11	11.36	Main Depot Area	6	Debris area near Booster Station 2131 (SEAD-58), possible DDT disposal	1, 18	Non
30,10	0.25	Airfield Area	7	Connex - unknown contents	Visual Inspection	Non
22,22	0.09	Warehouse Area	7	Building S-335 (SEAD-68) - old pest control shop	1	Non
17,20	4.95	Duck Ponds Area	7	Mounds possibly related to small arms range north of Building 309	Visual Inspection, Interview	Non
11,21	1.10	Duck Ponds Area	7	Mound of unknown contents	Visual Inspection	Non

CERFA Table 2a
(Continued)

L	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	
	3,17	0.25	Duck Ponds Area	7	Mound of unknown contents	Visual Inspection	N
	2,17	0.25	Duck Ponds Area	7	Mound of unknown contents	Visual Inspection	N
	2,11	4.96	North Depot Area	7	Mounds and a rusty drum	Visual Inspection	N
	19,2	0.25	Lake Housing Area	3	Building 2438 - sewage release outside of building	Spill list	R h
	24,23	2.02	Warehouse Area	3	Building 349 - spills reported in 1986, 1989, and 1991	Spill list	R h
R	27,25	4.65	Warehouse Area	3	Building 357 - spills reported in 1990, 1991, and 1992; leaking tank reported in 1987	Spill list, LUST list	R h
	18,17	0.25	Main Depot Area	3	Building C-509 - spill reported in 1992	Spill list	R h
	19,2	0.25	Lake Housing Area	2	Building 2452 - fuel oil AST reported leaking in 1991	LUST list	R h
	2,14	0.25	North Depot Area	2	Building 752 - fuel oil AST reported leaking in 1992	LUST list	R h
	19,23	0.25	Elliot Acres Housing Area	2	Building 212 - fuel oil AST reported leaking in 1990	LUST list	R h
	2,11	0.25	North Depot Area	2	Building 715 - fuel oil release from Building 718 contained in secondary sewage treatment facility	Spill list	R h
	19,22	0.25	South Depot Area	7	Rumored coal ash disposal area	Rumors list	N
	19,22	0.25	South Depot Area	7	Rumored coal storage area	Rumors list	N
	2,14	0.25	North Depot Area	7	Rumored DDT cans disposal area	Rumors list	N
	2,12	0.25	North Depot Area	7	Rumored drum disposal area	Rumors list	N
	18,2	0.25	Lake Housing Area	2	Building 2411 - Fuel oil spill	Spill list	R h
	19,2	0.25	Lake Housing Area	2	Building 2448 - Fuel oil spill	Spill list	R h
	29,11	0.25	Airfield	2	Non-PCB oil release from pole-mounted transformer	Spill list	R h

CERFA Table 2a
(Continued)

	LOCATION (X,Y COORDINATES)	APPROXIMATE SIZE (ACRES)[b]	GEOGRAPHIC AREA	ENVIRONMENTAL CONDITION CATEGORY NUMBER	BASIS (SWMU NO.)	EBS SOURCE OF EVIDENCE[c]	RI
	23,22	0.25	Warehouse Area	2	Building 342 - Diesel fuel spill	Spill list	Req have
	19,23	0.25	Elliot Acres Housing Area	2	Building 214 - Fuel oil spill	Spill list	Req have
	29,20	0.25	Main Depot Area	4	Hydraulic oil spill in drainage ditch	Spill list	Req have
	26,20	0.25	Main Depot Area	4	Hydraulic oil spill along East Patrol Road	Spill list	Req have
	23,22	0.25	Warehouse Area	4	Building 330 - Waste oil spill	Spill list	Req have
	18,7	0.25	Lake Housing Area	7	Farm trash dump along Kendaia Creek	Visual Inspection	Non

nitions are as follows:

storage
release or disposal
substance storage
substance release or disposal

Qualified parcel label definitions are as follows:

A = asbestos containing material
L = lead-based paint
P = polychlorinated biphenyls
R = radon
X = UXO and/or ordnance fragments
RD = radionuclides
(P) = possible (unverified)

proximate; they have been calculated using AutoCad Release 12.

e numbers refer to documents listed in Table 2-1 of this report.

Attachment 1

New York State Office of Parks, Recreation and Historic Preservation
Finger Lakes Region — PO Box 1055, Taughannock Park Road, Trumansburg, New York 14886-0721 607-387-70
FAX 607-387-33

Bernadette Castro, Commissio
John C. Clancy, Regional Dire

"FAX" COVER LETTER

TO: BOB MUTA 303-694-3946

FROM: TONY PECORARO

Number of pages (including cover letter): 3

If you have a problem with this transaction,

CONTACT: TONY

AT: 607/387-7041 EXT. 124

DATE: 10/3/97

X FOR YOU INFORMATION ____ RETURN REPLY REQUESTED

____ FOR YOUR APPROVAL ____ PER OUR DISCUSSION

X AS YOU REQUESTED

____ MESSAGE: Here is the spill report and remarks made by the NY State Dept. of Environmental Conservation. This tank was located in our Maintenance area, south of the Entrance to the Park.

If you need anything else, please call me at 607-387-7041 extension 124.

- Tony.

NYSDEC SPILL REPORT FORM

DEC REGION#: 8 (Avon) SPILL NUMBER: 8911337
SPILL NAME: SAMPSON STATE PARK DEC LEAD: PL
CALLER'S NAME: JESSE MILLER NOTIFIER'S NAME:
CALLER'S AGENCY: STATE PARKS NOTIFIER'S AGENCY:
CALLER'S PHONE: (607) 387-7041 EXT. NOTIFIER'S PHONE: EXT.

SPILL DATE: 03/01/90 TIME: 10:00
CALL RECEIVED DATE: 03/01/90 TIME: 10:45 RECEIVED BY CID #:

Material Spilled	Mat. Class	Am't Spilled	Units	Am't Recovered
1) GASOLINE	(Pet-Haz-Other-Unk.)	0	(Gal) - Lbs	0
2)	Pet-Haz-Other-Unk.		Gal - Lbs	
3)	Pet-Haz-Other-Unk.		Gal - Lbs	
4)	Pet-Haz-Other-Unk.		Gal - Lbs	

SPILL LOCATION

PLACE: SAMPSON STATE PARK
STREET: ROUTE 96
T/C/V: ROMULUS CO: SENECA
CONTACT:
PHONE: EXT.

POTENTIAL SPILLER

NAME: SAMPSON STATE PARK
STREET: RT 414
CITY: DRESDEN
STATE: NY ZIP:
CONTACT:
PHONE: (315) 585-9953 EXT.

SPILL CAUSE

Human Error	Tank Test Failure	(Tank Failure)
Traffic Accident	Housekeeping	Tank Overfill
Equipment Failure	Deliberate	Other
Vandalism	Abandoned Drums	Unknown

SPILL SOURCE

Gas Station	Private Dwelling	Non-Maj Facility
Passenger Vehicle	Vessel	Comm/Indust
Comm. Vehicle	Railroad Car	(Non-Comm/Instl)
Tank Truck	Major Facility	Unknown

RESOURCE AFFECTED

On Land	(Groundwater)	Air
In Sewer	Surface Water **	

**WATERBODY:

SPILL REPORTED BY

(Responsible Party)	Tank Tester	Local Agency
Affected Persons	DEC	Federal Gov't
Police Department	Citizen	Other
Fire Department	Health Dept.	

CALLER REMARKS: 1000 GAL UNDERGRND GAS TANK TAKING ON WATER. TANK SCHEDULED TO BE REMOVED B
OGS CONTRACT SOMETIME IN 1990. CONTACT PERSON: WALLY DREHER (315) 585-9953

PBS Number	Tank Number	Tank Size	Test Method	Leak Rate

PRIMARY CONTACT CALLED DATE: TIME: hrs. REACHED DATE: TIME:
SECONDARY CONT. CALLED DATE: TIME: hrs. FAXED BY CID#:

PIN #	T & A	Cost Center	SR to Central Office	
Cleanup Ceased 04/19/91	Meets St'ds YES	Last Inspection	Penalty NO	
RP-CUI	ENF-INIT	INVES-COM	CAP	
UST Trust Eligible YES	Site: A B C D E	Resp. Party 1 2 3 4 5 6	Reg Close Date 04/19/91	

Created on 03/02/90 Last Updated on 04/22/91 Is Updated? NO EDO DATA INPUT [ ]
Date Printed: 10/03/97

Spill Number: 8911337 **Spill Name:** SAMPSON STATE PARK **Printed on:** 10/03/97

DEC REMARKS

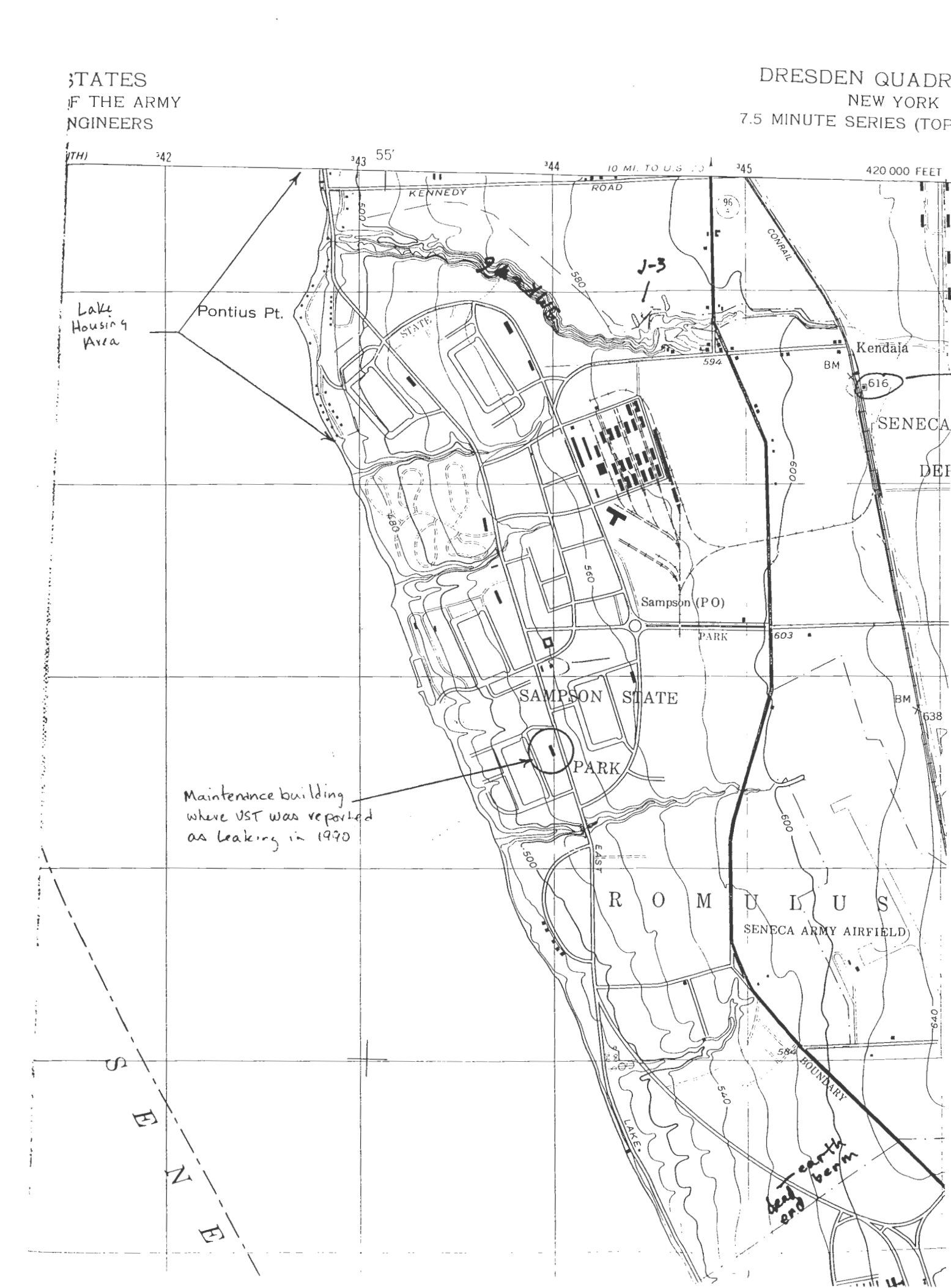
03/01/90: TANK CHECKED ON 2/1/90 22" TOTAL LIQUID IN TANK ~130 GAL OF PRODUCT. TANK CHECKED ON 3/1/90 NO PRODUCT HAD BEEN ADDED. TANK WAS NEARLY FULL OF WATER.

03/01/90: ADVISED OWNER TO HAVE PRODUCT PUMPED OFF ASAP, SUPPLIED CONTRACTOR NAMES. OWNER WILL NOTIFY US PRIOR TO TANK REMOVAL.

04/03/91: BS & MZ ARRIVED ON SITE & FOUND TANK TOP EXPOSED W/WATER IN EXCAVATION. NO SHEEN ON WATER OR ODOR TO SOIL THAT HAS BEEN REMOVED. FRASER & MORT NOT ON SITE YET SO WE LEFT WITH NO PROBLEMS FOUND ON SITE.

04/03/91: BS TO CONTACT FRASER WITH RESULTS OF INSPECTION.

04/19/91: BS TELCON W/DON FRASER OF OGS WHO SAID TANK WAS REMOVED NEXT DAY WITH NO CONTAMINATION ENCOUNTERED. NO FURTHER ACTION NEEDED.


STATES
F THE ARMY
NGINEERS
DRESDEN QUADR
NEW YORK
7.5 MINUTE SERIES (TOP
42
43 55'
44
10 MI. TO U.S.
45
420 000 FEET
KENNEDY
ROAD
96
CONRAIL
J-3
580
500
Lake Housing Area
Pontius Pt.
STATE
Kendaia
BM
616
594
SENECA
DEP
600
480
560
Sampson (PO)
PARK
603
SAMPSON STATE
PARK
BM
638
Maintenance building where UST was reported as leaking in 1990
600
500
EAST
R O M U L U S
SENECA army AIRFIELD
640
584
BOUNDARY
540
LAKE
earth berm
dead end
S E N E

Attachment 2

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT ACTIVITY
5786 STATE RTE 96
ROMULUS NEW YORK 14541-5001

REPLY TO
ATTENTION OF

SDSTO-SEM-P (385-11a)

MEMORANDUM THRU

Commander, Tobyhanna Army Depot, 11 Hap Arnold Blvd., Tobyhanna, PA 18466-5000

Commander, U.S. Army Depot System Command, ATTN: AMSDS-IN-S, Chambersburg, PA 17201

FOR Commander, U.S. Army Materiel Command, ATTN: AMCSF (J. Manfre), 5001 Eisenhower Ave., Alexandria, VA 22333

SUBJECT: Decommissioning Survey, SEDA, Romulus, NY

EXECUTIVE SUMMARY

1. The purpose and summary of the findings for subject survey are as follows:

a. PURPOSE: At the request of HQ, U.S. Army Materiel Command and U.S. Army Depot System Command, we performed a decommissioning survey of the remaining eight (8) munitions storage bunkers at SEDA for the purpose of releasing the sites for unrestricted use.

b. SUMMARY: No fixed or removable radiological contamination was found at the surveyed sites that exceeded regulatory guidelines and requirements. Based upon these findings, the munitions storage bunkers listed in Appendix A may be released for unrestricted use.

2. A detailed report of the survey is at enclosure.

3. POC's are Mr. Thomas Reynolds or Mr. John Cleary, Facsimile on DSN 489-5933; or Voice on DSN 489-5370 or COM (607) 869-1370.

Roy E. Johnson

Encl

ROY E. JOHNSON
LTC, OD
Commanding

DECOMMISSIONING SURVEY
SENECA ARMY DEPOT ACTIVITY
MUNITIONS STORAGE BUNKERS
ROMULUS, NY

1. REFERENCES:

a. Report, Radioactive Material Decommissioning Survey - Seneca Army Depot (SEAD), dated 14 July 1993.

b. AR 385-11, Ionizing Radiation Protection, 1 May 1990.

c. NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination, 1 June 1992.

d. U.S. Nuclear Regulatory Commission, Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material, 1 May 1987.

2. AUTHORITY: Reference 1a.

3. PURPOSE: Perform a decommissioning survey of munitions storage bunkers at SEDA for the purpose of releasing the sites for unrestricted use.

4. BACKGROUND:

a. The SEDA Radiological Assistance Team (RAT) was requested to finish the decommissioning surveys of the remaining eight munitions storage bunkers not surveyed by June 1993. The surveys were required for the purpose of ascertaining and quantifying the existence of any radiological contamination. The following bunkers were identified to be surveyed: A0202, A0204, A0206, A0208, A0212, A0213, A0218, and A0305. During the period from 26 August 1994 to 17 November 1994, the eight (8) bunkers have been surveyed. The ancillary maintenance buildings are, at this time, being utilized, and not available for survey.]

b. The decommissioning survey consisted of: (1) portable RADIAC meter readings for the detection of fixed contamination levels, (2) wipe test samples., for the quantification of removable gross alpha/beta and tritium contamination, (3) and the collection of sand samples from A0202 and A0204 for radioanalysis.

c. The portable RADIAC meter survey and wipe testing of the bunkers was performed by members of the SEDA RAT team in accordance with (IAW) procedures identified in Appendix B. The U.S. Army Ionizing Radiation Dosimetry Center (USATA) at Lexington, KY provided radioanalysis of the samples collected

and the interpretation of laboratory results.

5. SEDA RAT Team Survey:

a. Fixed Contamination Quality Control Procedures:

(1) In-house quality control measures were performed to verify the operation of the portable RADIAC meters prior to deployment. The instrument used to determine fixed alpha activity was a Ludlum Model 3 with a Model 43-5 scintillation probe. The instrument used to determine fixed beta-gamma activity was a Ludlum Model 3 with a Model 44-9 Geiger-Mueller (G-M pancake) probe.

(2) Prior to entering each bunker, a background count for each instrument was obtained by holding the detector at ground level for a sufficient time to allow meter to stabilize.

b. Fixed Contamination Survey Techniques:

(1) The surveys were performed to meet the requirements of references 1c and 1d. SEDA RAT utilized three person teams to perform each bunker survey, one for meter readings, one for taking swipes, and one for recording data.

(2) Prior to surveying each bunker, a grid pattern of 4'x5' rectangles was drawn on all the bunker surfaces. These dimensions were chosen for ease of drawing out the grid pattern in the bunker structure, yet remaining within the requirements of reference 1c. (enclosures 1 - 4)

(3) A fixed gross alpha and gross beta/gamma radiation reading was obtained in each grid location. (enclosure 5)

c. Removable Contamination Survey:

(1) Wipe Test Samples: For each grid location, two swipes, i.e., NuCon smears and S&S filter swipes, were obtained to detect for removable gross alpha/beta and tritium contamination, respectively, over a 100 square centimeter area on the bunker surfaces. The samples were sent to the Dosimetry Center laboratory for analysis.

(2) NuCon smears were used for the detection of removable gross alpha/beta contamination. The smears were arranged in packets corresponding to the specific location identification number assigned to each bunker. Upon completion of the structure, samples were sent for analysis.

(3) S&S 8A85 Membrane filters were used for the detection of tritium contamination. Each filter was dampened with distilled water prior to use. After swiping, the

dampened filter was placed in a 20 milliliter (ml) glass liquid scintillation vials with 2ml of distilled water in the vial. The vials were marked on the cap with the corresponding specific location identification numbers assigned to each bunker. Upon completion of the structure, samples were sent to the USATA at Lexington for analysis.

(4) Sand Samples: These samples were collected to determine the presence of tritium contamination from within the inner styrofoam dividers utilized in bunkers A0202 and A0204. The sand samples were placed in plastic bags and sent to the Radiation Research Office, U.S. Army Test, Measurement and Diagnostic Equipment Activity laboratory at Fort Belvior, Virginia for analysis. A detailed summary of the sand can be found in Appendix C.

6. USATA Laboratory Procedures:

a. The sample procedures used at the laboratory can be found in Appendix D.

b. The laboratory results can be found in enclosure 6.

7. Decommissioning Survey Results:

a. Fixed Contamination Instrument Survey: No fixed alpha/beta meter readings were detected above releasable limits for unrestricted use throughout the bunkers surveyed.

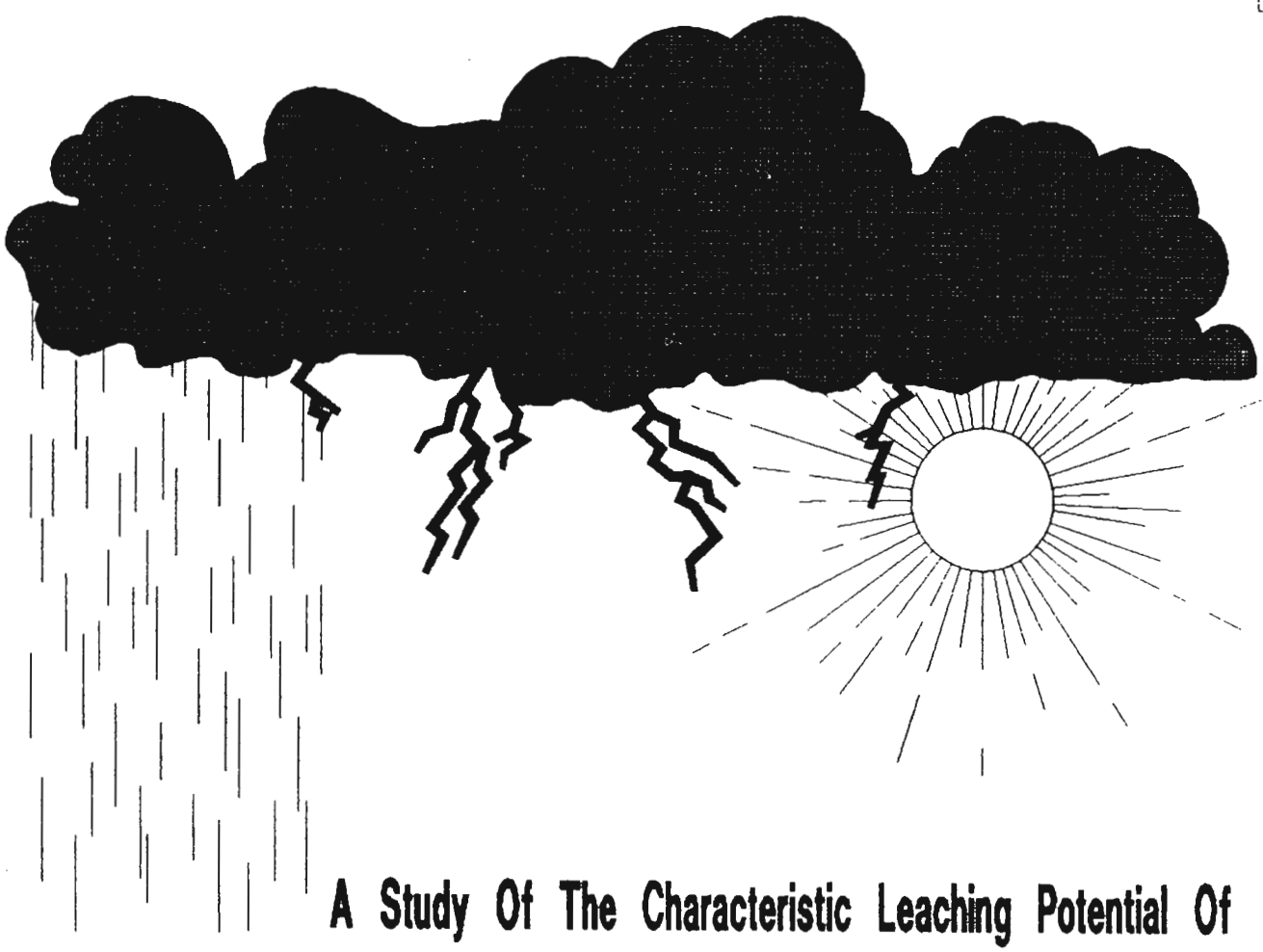
b. Removable Contamination Survey: The analysis of the wipe tests reveals no removable activity exceeding the contamination limits set forth by references 1b and 1d.

c. The instrument and laboratory results are provided at enclosure 6.

8. CONCLUSION:

Based upon the results of our decommissioning survey of the munitions storage bunkers listed in Appendix A, no fixed or removable radiological contamination was found at the surveyed sites that exceeded regulatory guidelines and requirements. The munitions storage bunkers identified may be released for unrestricted use.

Attachment 3



A Study Of The Characteristic Leaching Potential Of Defense National Stockpile Ores, Minerals and Alloys

FORWARD

THIS STUDY WAS PERFORMED TO RESOLVE SEVERAL ENVIRONMENTAL ISSUES REGARDING THE OUTDOOR STORAGE OF STRATEGIC AND CRITICAL MATERIALS AND TO ASSIST THE DEFENSE NATIONAL STOCKPILE CENTER IN ITS EFFORTS TO MAINTAIN A LEADERSHIP ROLE IN THE AREA OF ENVIRONMENTAL PROTECTION. THE INPUT OF ALL DNSC DIVISIONS AND FIELD STAFFS WAS ESSENTIAL IN THE FORMATION OF THIS STUDY AND THEIR INPUT AND KNOWLEDGE OF STOCKPILE ORES, MINERALS, AND METALS WAS INVALUABLE.

THE DEFENSE NATIONAL STOCKPILE CENTER HAS ALWAYS TAKEN AN ACTIVE ROLE IN SAFETY, HEALTH, AND ENVIRONMENTAL PROTECTION AND WILL CONTINUE TO MAKE A CONCERTED EFFORT TO PROTECT OUR PEOPLE AND THE COMMUNITY WE SERVE AND INSURE THAT OUR MISSION FOR THE FEDERAL GOVERNMENT DOES NOT HAVE A NEGATIVE IMPACT ON THE ENVIRONMENT.

Prepared by:
F. KEVIN REILLY
INDUSTRIAL HYGIENIST

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. The Defense National Stockpile Center (DNSC) initiated a study to determine the actual characteristic leaching potential of the ores, minerals, and alloys maintained in the stockpile.

2. Environmental Protection Agency (EPA) standard, reproducible leaching tests were performed on samples of all DNSC ores, minerals, and alloys in a "worst case scenario" situation. Test materials were crushed to extremely small particles to expose as much surface area as possible to the acid leaching procedure.

3. Three characteristic leaching test were performed on each of the seventeen stockpile materials, the subject of this study. Field size samples were also subjected to the same EPA extraction procedure for comparison to the "worst case scenario" test results.

4. The characteristic leaching test results clearly show that the stockpile ores, minerals, and alloys leach but not to a degree to present an environmental hazard. All of the results fell well within prescribed EPA levels for the heavy metals of concern even under the "worst case scenario" situation.

5. Analytical results clearly indicated that the outdoor, generally unprotected storage of DNSC ores, minerals, and alloys leach limited quantities of the heavy metals of environmental concern and should have minimal negative affect on the local environment.

OVERVIEW

The Defense National Stockpile Center, under the purview of the Strategic and Critical Materials Stock Piling Act (50 U.S.C. 98 et seq), is required to maintain a stockpile of strategic and critical materials to decrease dependence upon foreign sources of these materials in times of national emergency. The Act specifically requires that the Stockpile inventory be sufficient to support U.S. military strategies and industry requirements for not less than three years during a conventional global conflict. Strategic and critical materials within the forty year old Stockpile inventory, range from antimony to zinc, with a total value of approximately 9 billion dollars.

The Defense National Stockpile Center (DNSC) materials are stored in large warehouse and outdoors. The stockpile ores, minerals and alloys that are the subject of this study are stored uncovered outdoors. The ore piles occupy a total of 2500 acres at 90 sites in thirty five (35) states across the country.

THE PROBLEM

Over the last several years environmental awareness and public concern about air and water pollution have heightened across the entire country. These sensitivities have also increased within the Defense National Stockpile Center. Several stockpile storage facilities located on U.S. military installations have caused environmental questions to be raised, by both the State and Federal environmental agencies investigating environmental contamination at these DoD facilities. Due to the size and quantity of the DNSC piles of materials such as beryl, chromite, manganese and numerous other minerals, ores, and alloys the State, Federal, and DoD environmental groups consider the Stockpile materials a major potential sources of soil and groundwater contamination. These unfounded environmental viewpoints, when considering the vast magnitude of Defense National Stockpile Center materials stored across the country, are of major concern to us.

How should the Defense National Stockpile Center (DNSC) evaluate the potential impact of our materials stored outside uncovered in the environment. What is the potential for soil and groundwater comtamination, taking into consideration the total amount of stockpile material, the number of locations, and the numerous variables (i.e. soil conditions, precipitation, geology, hydrology, etc.) presented at each one of our storage locations?

The DNSC presently maintains 480 individual piles of ores and minerals at 90 stockpile storage locations across the country. The total quantity of material is 31.7 million short tons and they occupy approximately 2500 acres of land. Some of these ores, minerals and alloys are stored directly on ground, some on slag or stone bases, and some on asphalt or reinforced concrete pads.

The geological, hydrological and topographical conditions present at each of the 480 piles and 92 storage sites are different. The storage sites are located in different areas of precipitation and the "acid rain" concentration, another environmental concern, varies from site to site as well. The number of variables relating to the environmental evaluation of each storage site and/or pile is monumental. In light of these variables the DNSC has taken a positive, standard and reproducible approach by initiating a study or the first phase of an environmental assessment and to clearly characterize and identify potential environmental hazards presented by the ores, minerals, and alloys themselves. If analytical data proves it to be to be necessary, we will then proceed with phase 2 and evaluate individual sites or possibly those sites that present specific environmentally sensitive areas or specific State or local concerns. This alternative approach is explained below.

ALTERNATE APPROACH

As explained above, we felt that our best approach was to explore and evaluate the potential leachability of the ores, minerals, and alloys themselves rather than the specific piles of material and/or the sites where they are located.

First, all of the purchase specifications for the Stockpile Materials were reviewed to determine the chemical composition of each material. From these purchase specifications seventeen (17) specific potential environmental contaminants (heavy metals) were noted and are listed below:

Antimony	Iron	Silver
Arsenic	Lead	Vanadium
Barium	Magnesium	Zinc
Beryllium	Manganese	
Cadmium	Mercury	
Chromium	Nickel	
Copper	Selenium	

Secondly, representative samples must be collected of each ore, mineral, and alloy.

Third, a standard and reproducible analytical tests must be performed to address our environmental concerns about leaching and the potential damage to the environment.

After researching the literature and several discussions with mineralogists, geologists, and private environmental consulting firms, it appeared that the EP Toxicity Test as outlined in the Federal Register, Volume 45, No. 98, May 19, 1980, would provide the analytical information necessary to evaluate the leaching potential of our materials and their ultimate impact on the environment. We base this reasoning on the fact that although the stockpile materials are not a "waste material", the EP Tox Test is a standard test required by the Environmental Protection Agency to determine whether or not a material (waste) can be safely placed in a landfill. If the material does not leach hazardous constituents, it will not cause degradation or harm to the environment. This standard test also creates a worst case scenario, as it relates to Stockpile ores, minerals, and alloys.

By crushing the sample (material) to a size no greater that 9.5 millimeters (mm), as is required by this specific environmental test, the surface area of the test material increases significantly. This in turn significantly increases the material's ability to leach. This creates a "worst case" situation since Stockpile materials are not stored in size parameters much larger thus limiting the materials susceptibilty to leach. As noted in the Description of Materials (see Appendix 1), stockpile materials are much larger in size (average size 2 to 6 inches). This specific size relationship will be further discussed later in this report.

In addition to the Standard EP Tox test procedures, we determined that an additional test using a pH 4 solution rather than the required pH 5 as called for in the standard method, would provide useful data in our overall environmental evaluation of our materials. By incorporating this slightly more "acidic" variance into our requirements we could more closly simulate the extracting potential of "acid rain". (A review of ASTM (ASTM Standardization News. April 1987) data and the Environmental Protection Agency information regarding "acid rain" on a national level indicates that the resulting pH of acid rain nationally varies from a pH 4 to pH 5 and/or higher).

ACTION

Having outlined our requirements and determining that the EP Tox Test and the lowering of the acid pH in the test procedures would provide the necessary analytical information to establish the leaching potential of our materials, we solicited the services of an independent qualified laboratory. Gannett-Fleming Environmental Engineers Inc,. of Camp Hill, Pennsylvania was the successful bidder and was awarded the contract. Gannett-Fleming is certified (Certification Number 22-133) by the State of Pennsylvania Department of Environmental Resources (PADER) and also performs analytical work and numerous environmental evaluations for PADER under a State funded contract.

We collect representative samples of (17) seventeen Stockpile ores and minerals using standard Quality Assurance collection techniques (see Appendix 6 - Materials Inspection and Quality Control, GSA Handbook PMD 4400.1 1970, specifically sampling method 3). Since the majority of our materials were much larger in size and would not meet the requirements for testing per the established EPA procedure, collected samples were submitted to several laboratories specializing in the chemical evaluation of ores and minerals that were capable of "crushing" these materials to the mesh size required. Approximately (4) four pounds of each material, were properly crushed to meet the requirements of the EP Tox procedure and submitted to Gannett-Fleming for evaluation.

During this testing period May 1989 to September 1992, the Environmental Protection Agency finalized their new procedure to replace the EP Toxicity Test Procedure. This new analytical procedure called the Toxicity Characteristic Leaching Procedure (TCLP)-Final regulation March 1990, was to be used for the same purpose but was a much more aggressive analytical and involved procedure. It uses various extraction reagents at lower pH than the EP Tox Test and according to EPA would provide an additional margin of safety to the environment.

In light of this new procedure, we requested Gannett Fleming to perform the TCLP test on the seventeen (17) stockpile ore, mineral, and alloy samples.

We now have three analytical tests results for each stockpile ore mineral and alloy to better evaluate their potential impact on the environment.

FINDINGS AND DISCUSSION

Appendix 3 contains the summary of the tests performed in tabular form. Each material, the specific chemical constituent analyzed for and the specific test that was performed (pH 5, pH 4 and TCLP). As can be noted ALL results, with the exception of Fluorspar (acid grade), fell well within the established EP Tox and/or TCLP limits for the heavy metals evaluated (see listing page 2). The Fluorspar (acid grade) did leach significant amounts of lead (Pb), 15.3 mg/l, 10.2 mg/l, 13.8 mg/l for pH 4, pH 5, and TCLP, respectively. Stockpile fluorspar however, is not exposed to the elements. It is stored within asphalt or plastic lined trenches 8 to 10 feet deep and covered with an impermeable, secured, polyvinyl chloride cover as noted in the photograph in Appendix 8. So, although tests indicate that this material has the potential to leach hazardous constituents it is protected and contained during storage thus posing no hazard to the environment.

All the other materials showed little if any leaching. The two most pronounced leachable constituents that were analyzed for were manganese and magnesium. These materials, both extremely soluble, were generally several factors higher than the other analyzed materials. Since ferro manganese (high carbon) and ferro chrome (high carbon) leached considerable amounts of manganese and slightly elevated levels of chromium, we decided to use these materials in another test to determine the relationship between the laboratory scale test and a "field size test".

Standard EP Tox and TCLP methods require that samples be crushed to a size no greater than 9.5mm or about three eighths of an inch. 100 grams of this "crushed" material is subjected to the acid extraction procedure for leachate analysis. Our materials, as stored in the stockpile, are considerably larger generally in the range of 2 to 6 inches cubed (see photographs, Appendix 8). Our goal was to perform a modified EP Tox tests on a large size sample to typify the actual size of the material maintained within the stockpile. The sample was not crushed. It was mixed with 16 times it's weight in water in a 150 gallon nalgene tank. The pH was maintained at a pH 5 and pH 4 as in the other tests, and stirred with a large mixer for 24 hours. Compressed air was also fed into the tank, while the mixing took place. The results of this modified tests are included in Appendix 5. As can be noted the results are drastically reduced as would be expected using the surface area/weight relationship. The exposed surface area to weight relationship of a 100 grams of crushed material no

larger than 3/8ths of an inch is significantly greater, in the order of 100 to 1000 times, than the surface area of a 2 to 6 inch, 32 pound cube of the same material. A comparative look at the Ferro manganese results lends strong creditability to this hypothesis. Similar results were noted in the ferro chromium test but were not as dramatic as those of the ferro managanese, so for illustration purposes only the ferro manganese was compared and is documented below:

Ferro manganese (high carbon)

Standard Method using 100 grams of crushed ferro manganese and leachate analyzed for manganese resulted in:

pH 4 - 5250 mg/l

pH 5 - 2200 mg/l

Modified method using a 32 pound sample of ferro manganese approximately 5 inches cubed and leachate analyzed for manganese resulted in:

pH 4 - 1.37 mg/l

pH 5 - 0.38 mg/l

On the basis of these results and the surface area to unit weight relationship, the following mathematical equation shows the drastic reduced leachability of the field size sample as compared to the standard "crushed" size sample required under the EP Tox procedure. Please note the following:

3/8" Sphere - surface area = $4(\pi)r^2 = 4(\pi)(0.1875)^2 = 0.04418$ in^2

volume = $4/3(\pi)r^3 = 4/3(\pi)(0.1875)^3 = 0.0276$ in^3

5" Cube - surface area = 6 X w X h = 150 in^2

$$\text{volume} = w \times h \times d = 125 \text{ in}^3$$

$$\text{calculating density} = 32 \text{ lbs.}/125 \text{ in}^3 = 0.256 \text{ lbs./in}^3$$

$$0.256 \text{ lbs./in}^3 \times 453.59 \text{ gms/1 lbs} = 116 \text{ gms/in}^3$$

$$\text{weight of 1 - 3/8" sphere} = 0.0276 \text{ in.}^3 \times 116 \text{ gms/in}^3 = 3.2 \text{ grams}$$

100 gram sample contains 100/3.2 grams = 31.25 spheres

$$\text{100 gram sample contains 31.25 spheres} \times 0.4418 \text{in}^2/\text{sphere} = 13.8 \text{ in}^2$$

consequently, in the EP Tox procedure - 100 grams of 3/8 spheres

offers $13.8 \text{ in}^2/100 \text{ grams} = 0.138 \text{ in}^2/\text{gram}$ for acid digestion

testing on the 5" cube would offer $150 \text{ in}^2/32\text{lbs} \times 1\text{lbs}/453.59 \text{ gms}$

equals $0.0101 \text{ in}^2/\text{gram}$ for acid digestion.

If we assume a linear relationship between the surface area per unit weight of the material and the EP Tox results the following ratio can be set up to calculate the theoretical EP Tox result for a field size sample - the 5 inch cube test.

$$\frac{0.0101}{0.138} = \frac{X}{5250 \text{ mg/l}} \qquad \frac{0.0101}{0.138} = \frac{X}{2200 \text{ mg/l}}$$

$$X = 384.24 \text{ mg/l} \qquad X = 161.01 \text{ mg/l}$$

This scenario is based on the premise that ALL the pieces of the "crushed" sample are symetrical 3/8 inch spheres, which as is noted in the actual procedure, is not true. The EP Tox procedure specifically states that "the solid material has a surface area per gram equal to or greater than 3.1 cm squared or "passes through" a 9.5 millimeter (mm) or 0.375 inch standard sieve". This statement depicts many particles 3/8 inch in size and smaller "passing through" the sieve and available for acid digestion. This is clearly a major reason this mathmatical model does not equate to the results received. It would appear that a complete sizing of all the particle present in the actual EP Tox test would be necessary for this "model" to balance out correctly.

To further define and evaluate the standard EP Tox and TCLP results with that of our field size sample results, three additional representative field size samples were collected. Samples of ferro manganese in sizes of approximately 1 inch, 2 inch and 3 inch cubes were submitted to Gannett-Fleming for analysis along with a crushed sample for a determination of the particle size distribution of a standard sample as used normally in the EP Tox and TCLP method.

(Results of the particle size distribution are in Appendix 6 and the results of the field size sample analysis are included in Appendix 5)

The following table provides a synopsis of the geometric and analytical data gathered during this comparative testing.

TABLE 1

GEOMETRIC AND ANALYTICAL DATA
FERRO MANGANESE COMPARISON

	STANDARD	1 INCH	2 INCH	3 INCH	5 INCH
SIZE	*0.176 in.	1.00 in	2.00 in	3.00 in	5.00 in
SURFACE ** AREA (SA)	28.45 in^2	6 in^2	24 in^2	54 in^2	150 in^2
SA/UW***	0.2845	0.509	0.0254	0.0170	0.0102
pH 4	5250mg/l	12.3mg/l	10.3mg/l	4.85mg/l	1.37mg/l
pH 5	2200mg/l	2.60mg/l	1.63mg/l	1.25mg/l	0.38mg/l

* Based on sieve size analysis of particle sizes ranging from 9.5mm to less than 0.075mm, the particle size at 50% finer by weight is 0.176 inches.

** Assuming particle size of 0.176 inches, based on sieve analysis as detailed above, the surface area of sample can be calculated.

*** Surface area (SA) to unit weight (UW) was calculated assuming all particles were spheres at a diameter of 0.176 inches. SA/UW is in inches squared per gram

TABLE 2

COMPARING CALCULATED TO ACTUAL EP TOX RESULTS
FOR FERRO MANGANESE ANALYSIS

	pH 4		pH 5	
	calculated	actual	calculated	actual
Standard	n/a	5250mg/l	n/a	2200mg/l
1" cube	939.28mg/l	12.3mg/l	393.60mg/l	2.60mg/l
2" cube	468.72mg/l	10.3mg/l	196.41mg/l	1.63mg/l
3" cube	313.71mg/l	4.85mg/l	131.45mg/l	1.25mg/l
5" cube	188.23mg/l	1.37mg/l	78.88mg/l	0.38mg/l

*Results are for manganese

NOTE: All laboratory results are included in Appendix 4 - Laboratory Analysis and Appendix 5 - Field Size Analysis

These additional test results clearly show a direct relationship between the surface area to unit weight ratio and the EP Tox results. This direct relationship is not linear in nature, especially when the SA/UW ratio becomes large as is experienced in the type of sample typically subjected to EP Tox testing. Even with the conservative approach of calculating the SA/UW ratio using the 50% finer than by weight particle size, the calculated values for larger sized particles (1", 2", 3" and 5" cubes) do not correlate with actual test results. This lack of direct correlation between calculated and actual values further indicates the non-linear nature of the relationship. The decreasing EP Tox values based on increasing size of the larger particles, for both the calculated and actual test results do however indicate that a direct relationship does exist. In conclusion it is apparent that the actual EP Tox test values for samples prepared in accordance with standard test protocol do not emulate the actual field conditions of DNSC stockpiled material and are therefore misleading as to the leachability of the materials in their stored state.

The concentration of heavy metals in the leachate derived from the crushed ores, minerals, and alloys in each case exceeded the drinking water standards in one constituent, generally lead (Pb). Other constituents such as arsenic, chromium, and cadmium were also slightly elevated above drinking water standards in ten (10) of the materials. However, using the logic of the surface area to unit weight relationship previously discussed, these results can probably be realistically reduced by a significant amount, which would return all of the levels to well within even the most stringent drinking water standards. Again it should be noted that, this entire testing protocol is the analysis of materials in a "crushed" state, which is not the state the materials are maintained within the stockpile. The analytical results reflected in this report are by far the worst possible case scenario.

SUMMARY

The information obtained as a result of this analytical testing although not conclusive appears to indicate quite strongly that the storage of stockpile ores and minerals, in the outside environment uncovered and exposed to the elements, pose no threat to human health and the environment from a leachability standpoint. The minimal amount of metals leaching

from these ores and minerals even in a "crushed state fall well within the present Toxicity Characteristic Leaching Procedure (TCLP) limits as well as the former EP Toxicity Tests standards. Even when the acidity of the extraction procedure was increased by a factor of ten, the results still fell within environmental prescribed limits.

Air pollution in the form of fugitive dust is minimal due to the size of the materials in storage and the materials of a smaller size (fine particles), as in the case of Jamacian Bauxite or Acid Grade Fluorspar, are covered either by impermeable polyvinyl chloride sheeting or by vegetation (see Photographs, Appendix 8). These protective covers also reduce if not eliminate the leaching potential of these specific materials.

The information documented in this report is sound and reproducible and the results appear to clearly indicate that the stockpile ores, minerals, and alloys stored outside and exposed to the environment even in a crushed state, do not leach hazardous constituents at discernable levels, even under more stringent testing parameters.

APPENDIX 1 - DESCRIPTION OF MATERIALS

ALUMINUM OXIDE: Al_2O_3 (ALUMINA)

DESCRIPTION: Fused Crude & Abrasive Grain. The abrasive grain is made from 94% pure fused crude and crushed. Spec calls for 99.7% fully fused. Material is gray-brown to reddish brown in color.

USES: abrasive grain is used as an abrasive in grinding and cutting such materials as alloys. It's also used for refractory purposes in paints and in dyes

TYPICAL CHEMICAL COMPOSITION: 94% Minimum Al_2O_3. Maximum Allowed by dry weight: Si-2% (as SiO_2); Fe-.75% (Fe_2O_3); Titania-2 to 3% TiO_2); Calcium Oxide-.35% (CaO).

SIZE PARAMETERS AND WEIGHT: The lumps shall be less than 6" in size. No more than 6% shall pass through a No. 60 (.0098") sieve.

CELESTITE: $SrSO_4$ (Strontium Sulfate)

DESCRIPTION: Celestite is a coarsely crystalline material ranging in color from a pearly white with faint tinges of blue, yellow, green or red to a color like pale cocoa. It can be in lump forms or fines.

USES: Celestite is the mineral source for strontium. It's used as fine agents in crystal glass and to impart irridescence in glasses and glazes, for television picture tubes, magnets and signal flares

TYPICAL CHEMICAL COMPOSITION: Strontium Sulfate-min-96%; Calcium, as Sulfate-max-.5%; Barium, as Sulfate-max-2%

SIZE PARAMETERS AND WEIGHT: The specific gravity is 3.95. Celestite is crushed to lumps of 1" size; greater than 1.5"-zero; between 1" and 1.5"-25% maximum; less than 50 mesh (.297 mm)-max-10%.

MANGANESE DIOXIDE-BATTERY GRADE: MnO_2

DESCRIPTION: A black powder.

USES: As a depolarizer in non-rechargeable dry cell batteries.

TYPICAL CHEMICAL COMPOSITION: (for Synthetic Battery Grade A) Available Oxygen (as MnO_2)-minimum 85%; Manganese (Mn)-Min. 58%; Total Insolubles-maximum 3%; Iron (magnetic)-max. .25%; Lead-max. .25%; Arsenic-none; copper-none; Total Heavy Metals (other than lead and iron)-max. .05%; Total alkali metals-max. .5%; Total Alkali Earth Metals-max. .5%; Carbon Dioxide-none. pH value: 4.0 to 7.0.

SIZE PARAMETERS AND WEIGHT: Specific Gravity is 4.75. 98% by weight shall pass a No. 60 (.0098") Sieve and 100% shall pass a No. 20 (.0331") Sieve.

SILICON CARBIDE: SiC

DESCRIPTION: Bluish-black irredescent crystalline material.

USES: As an abrasive, a refractory, and in metallurgical, chemical, and electrical applications.

TYPICAL CHEMICAL COMPOSITION: Silicon Carbide-minimum-96.5%; Free Silicon-maximum- 1%; free Carbon-maximum-1.2%.

SIZE PARAMETERS AND WEIGHT: Specific Gravity is 3.17. No lumps larger than 1.5". No more than 10% goes through a No. 60 sieve.

BAUXITE-METALLURGICAL: (Jamaican) Al_2O_3

DESCRIPTION: Bauxite is a clay like substance, ranging in color from dull white through pink to a brownish red.

USES: 90% of Metallurgical grade bauxite is used for the production of Alumina. Otehr uses include refractories and abrasives

TYPICAL CHEMICAL COMPOSITION (for Grade 1): Alumina-min-47%; Alumina at 143 degrees Celsius-minimum 40%; Alumina Monohydrate-max.-3%; Silica-max-3%; Ferric Oxide-max-22%; Manganese, Chromium and Vanadium Oxides-max-2%; Phosphorous Pentoxide-max-1.5%; Titanium Dioxide-max-3%. It's composed principally of aluminum oxide minerals, gibbsite, a trihydrate and the monohydrate boehrmite, and diaspore.

SIZE PARAMETERS AND WEIGHT: Specific gravity is 2-2.55.

FLUORSPAR-ACID GRADE: CaF_2 (Also-Fluorite)

DESCRIPTION: Fluorspar is a mineral, both coarse and fine grained, ranging in color from light-green, yellow, bluish-green, purple, rose blue and brown to colorless.

USES: Acid grade fluorspar is used primarilly in the manufacture of hydrofluoric acid (instrumental in the manufacture of aviation fuel) and synthetic cryolite, used in the manufacture of aluminum.

TYPICAL CHEMICAL COMPOSITION: (for Hydrofluoric Acid Grade A) Calcium Fluoride-minimum-97%; Silica-maximum-1%; Sulfur-max-.03%; Calcium Carbonate-max-1.25%; Sodium Chloride-max-.02%; Heavy Metal Oxide-max-.4%; Beryllium-max-10 ppm.

SIZE PARAMETERS AND WEIGHT: Specific gravity is 3.18.

FERROCHROME (HIGH CARBON):

DESCRIPTION: High Carbon Ferrochrome has a silver metallic look with a fine crystal structure. It's stored in lump form.

USE: H.C. Ferrochrome is used for higher carbon grades of stainless and alloy steels, tool steel, and cast iron.

TYPICAL CHEMICAL COMPOSITION:Chromium-62-71%; Carbon-maximum-8%; Silicon-max-3%; Phosphorus-max-.025%; Sulfur-max-.05%; Antimony-max-.01%; Manganese-max-.75%; Arsenic, Lead, Tin, Zinc-max-.005%; Iron-to be reported-usually 26-27%.

SIZE PARAMETERS AND WEIGHT: A maximum of 5% may pass a 2" sieve opening. Lumps may weigh up to 75 pounds.

KYANITE: $Al_2O(SiO_4)$

DESCRIPTION: Kyanite is an ore that is a natural silicate of aluminum. It has a vitreous luster and may vary in color from sky blue to green, gray, white or black.

USE: Kyanite is used chiefly for refractory purposes, especially in spark plugs and porcelain products such as pottery, ceramics and certain types of glass. It's also used in the manufacture of electrical insulators and in processing ferrous metals.

TYPICAL CHEMICAL COMPOSITION: (Grade A) Alumina-min-59%; Silica-max-39%; Iron Oxide-max-.75%; Titania-max-1.25%; CaO/MgO-max-.2%; Na_2O/K_2O-max-.2%; Total flux-2%.

SIZE PARAMETERS AND WEIGHT: Kyanite has a specific gravity of 3.56-3.66. Not more than 10% shall pass a .5" screen and not more than 1% shall pass a No. 60 Sieve (.25 mm). basically, the old spec states that the lumps should not be so large that one man can't handle one.

FERROMANGANESE (LOW CARBON):

DESCRIPTIONS: High Carbon Ferromanganese is generally in lump form, although it is available in crushed and mesh size, and appears steel gray to black in color, darkening with age.

USE: Primarily in the manufacture of steel, where the properties of manganese are indispensable.

TYPICAL CHEMICAL COMPOSITION: (Grade AA) Manganese-85-90%; Carbon-max-.1%; Silicon-max-1.5%; Phosphorus-max-.1%; Arsenic-max-.1%; Sulfur-max-.02%; Lead-max-.03%; Copper-max-.1%; Tin-Max-.1%; Zinc-max-.05%.

SIZE PARAMETERS AND WEIGTH: Lumps are 2" and down in size with a maximum of 5% passing through a .25" sieve.

FERROCHROME (LOW CARBON):

DESCRIPTION: Low Carbon ferrochrome has a silver metallic look with a large crystal structure and is stored in lumps, bricks, briquettes and pellets

USE: L.C. Ferrochrome is used in the production of very low carbon alloys and stainless steels, high temperature alloys, and acid resistant steels. It's also used for tool steel and cast iron.

TYPICAL CHEMICAL COMPOSITION: (regular) Chromium-minimum-67%; Carbon-max-.05%; Silicon-max-1%; Phosphorus-max-.03%; Sulfur-max-.025%.

SIZE PARAMETERS AND WEIGHT: Lumps shall be 8 mesh or larger and not exceed 50 pounds in weight.

CHROMITE-REFRACTORY: $Cr_2O_3 + Al_2O_3$

DESCRIPTION: Refractory grade chromite is a hard, dense non-friable lump of which not more than 15% shall pass through a No. 16 sieve. It is dark gray in appearance.

USE: Refractory grade chromite is used in furnaces as wall lining, in the manufacture of non-ferrous metals, in lime-kilns, and to make refractory bricks.

TYPICAL CHEMICAL COMPOSITION: (Ore) Chromic Oxide-minimum-32%; Chromic Oxide plus Alumina-min-59%; Iron-max-12%; Silica-max-5.5%; Lime-max-.5%; Magnesia-to be reported.

SIZE PARAMETERS AND WEIGHT: Not more than 15% of lumps shall pass a No. 12 Sieve (.0661 inches).

FLUORPSPAR-CHEMICAL: This is the same as Acid Grade Fluorspar.

FERROMANGANESE (HIGH CARBON);

DESCRIPTION: High Carbon Ferromanganese is generally in lump form, and appears steel gray to black in color, darkening with age.

USE: Primarily in the manufacture of steel, where the properties of manganese are indispensable.

TYPICAL CHEMICAL COMPOSITION: Manganese-76-78%; carbon-max-7.5%; Silicon-max-1%; Phosphorus-max-.35%; Arsenic-max-.3%; Phosphorus plus Arsenic-max-.6%; Sulfur-max-.05%; Tin-max-.02%; Lead-max-.05%; Chromium-max-.5%; Iron-to be reported.

SIZE PARAMETERS AND WEIGHT: Lumps shall be 8" by 2". A maxiumum of 5% shall pass through a 2" sieve.

FLUORSPAR-METALLURGICAL:

DESCRIPTION: Fluorspar is a mineral, both coarse and fine grained, ranging in color from light-green, yellow, bluish-green, purple, rose blue and brown to colorless.

USE: Metallurgical grade fluorspar is primarily used in the manufacture of steel, cast iron and ferro-alloys to aid in producing a fluid slag which facilitates passage of impurities into the slag.

TYPICAL CHEMICAL COMPOSITION: Effective Calcium Fluoride-minimum-70%; Sulfur-max-.1%; Lead-max-.24%; Arsenic-max-.01%; barium-max-.01%; Zinc-max-.01%; Phosporus-max-.25%; Tin-max-.02%; Antimony-max-.02%; Copper-max-.1%.

SIZE PARAMETERS AND WEIGHT: All met. grade fluorspar shall be in the form of gravel and, after washing, pass a 3" sieve. Not more than 10% shall pass a 3/8" sieve.

CHROMITE-METALLURGICAL:

DESCRIPTION: Metallurgical grade chromite is a hard, dense non-friable lump of which not more than 15% shall pass through a No. 16 sieve. It is dark gray in appearance.

USE: Metallurgical grade chromite is used in the manufacture of ferrochromium and chromium alloys

TYPICAL CHEMICAL COMPOSITION: Chromic Oxide-min-48%; Silica-max-8%; Sulfur-max-.04%; Phosphorus-max-.02%; Chromium to Iron Ratio-min-3:1; To be reported (no min or max): Calcium Oxide, Magnesium Oxide, Aluminum Oxide, Titanium Oxide, Arsenic, Tin, Lead, Zinc, Antimony.

SIZE PARAMETERS AND WEIGHT: Chromite Ore shall be lumpy and not more than 25% shall pass a 1" sieve.

MANGANESE ORE-METALLURGICAL:

DESCRIPTION: All manganese ores are small, black and lumpy in appearance.

USE: Metallurgical grade Manganese Ore is processed into alloys and metals.

TYPICAL CHEMICAL COMPOSITION: (Grade A) Manganese-min-48%; Iron-max-4%; Alumina-max-6%; Alumina plus Silica-max-9%; Phosphorus-max-.05%; Arsenic-max-.05%; Copper plus Lead plus Tin-max-.2%; Chromium-max-.3%.

SIZE PARAMETERS AND WEIGHT: Individual lumps shall not exceed 50 pounds and not more than 5% shall pass a No. 20 sieve.

BERYL:

DESCRIPTION: Beryl is a very hard, lustrous mineral and is an opalescent material which may be blue, green, yellow, brown or colorless. The crystals are frequently striated vertically and range from granular to large lumps.

USE: The principle use of Beryl ore is as the source for the metal beryllium which, as an alloying element mixed with copper, produces a tough, hard alloy with great resistance to fatigue and shock and high temperatures. beryllium is also an important metal in aerospace and nuclear applications

TYPICAL CHEMICAL COMPOSITION:(Concentrate) Beryllium Oxide-min-10%; Calcium-max-.5%

SIZE PARAMETERS AND WEIGHT: Beryl's specific gravity is approximately 2.7. All ore shall pass through a 4" sieve, and less than 5% shall pass a 10 mesh sieve (1.68 mm).

APPENDIX 2 - LOCATIONS OF MATERIALS, QUANTITIES, COVERAGE

dity	ST Quantity	# of Piles	SF Range	ST Range	States	Covered/ Uncovered	SAMPLE
m	585,540	20	1,665 109,500	889 77,212	9	100% Uncovered	DNS-
te	13,477	2	4,000 69,000	621 12,856	2	100% Uncovered	DNS-
se	216,752	33	434 111,575	160 53,637	5	50% Uncovered	DNS-
	70,627	4	9,017 45,100	3,423 38,558	2	50% Uncovered	DNS-
	22,692,356	22	3,400 3,932,000	11,285 8,062,536	7	100% Uncovered	DNS-
ar ade	934,780	19	279 369,652	75 199,812	8	100% Covered	DNS-
rome	639,799	105	540 53,533	45 57,776	8	100% Uncovered	DNS-
	1,187	2	930 15,000	140 1,047	2	100% Uncovered	DNS-
nganese	29,058	8	2,000 12,629	1,021 8,294	5	100% Uncovered	DNS-

rt ton
are foot

Y	ST Quantity	# of Piles	SF Range	ST Range	STATES	Covered Uncovered	Samp Nu
	257,852	31	461 50,000	451 42,672	7	100% uncovered	D
	394,797	10	2,000 91,000	5,075 100,761	7	100% uncovered	D
al	407,198	20	6,000 122,250	2,231 45,109	8	100% uncovered	D
ese	821,789	69	816 56,000	270 144,470	8	100% uncovered	D
	307,408	11	13,439 360,000	5,814 71,558	7	100% uncovered	D
	19,095	17	704 40,000	92 6,104	5	100% uncovered	D
al	2,108,321	45	252 248,770	149 208,685	9	100% uncovered	D
al	2,979,103	73	4 1,264,000	3 381,859	16	100% uncovered	D

APPENDIX 3 - SUMMARY OF ANALYTICAL RESULTS

INUM OXIDE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.2	(.01	(.01	0.01	0.01	0.38	(.03	0.16	0.97	0.0004	(.03	(.005	(.01	(.1	0.03
PH5	(.1	(.01	0.3	(.01	(.01	0.01	(.01	0.05	(.03	0.38	1.39	0.0006	(.03	(.005	(.01	(.1	0.02
TCLP	0.2	nd	0.5	nd	0.02	0.01	0.03	1.64	0.1	0.12	1.06	nd	nd	nd	0.02	nd	0.19

STITE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.1	(.01	(.01	(.01	0.03	0.04	0.13	58.4	2.12	0.0006	(.03	(.025	.01	(.1	0.11
PH5	(.1	(.01	0.1	(.01	(.01	(.01	0.01	0.01	(.03	30.5	0.25	0.0010	(.03	(.025	(.01	(.1	0.06
TCLP	0.2	0.008	0.2	nd	0.03	0.01	0.03	0.06	0.4	51.0	1.00	nd	0.07	nd	0.02	0.1	0.24

GANESE DIOXIDE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	0.048	0.1	(.01	0.01	(.01	0.01	0.02	(.03	19.5	2.32	0.0009	(.03	(.005	(.01	(.1	16.2
PH5	(.1	(.01	(.1	(.01	(.01	(.01	(.01	(.01	(.03	5.84	0.01	0.0005	(.03	(.005	(.01	(.1	0.36
TCLP	0.1	0.040	0.5	nd	0.02	0.01	0.02	0.05	0.1	11.1	0.12	nd	0.04	nd	0.01	nd	8.10

CON CARBIDE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.2	(.01	(.01	(.01	0.02	1.12	(.03	0.07	0.11	0.0012	0.14	(.005	(.01	0.8	0.03
PH5	0.1	(.01	0.1	(.01	(.01	(.01	(.01	0.84	(.03	0.08	0.07	0.0011	0.11	(.005	(.01	0.8	0.03
TCLP	0.2	nd	0.5	nd	0.01	0.01	0.02	0.94	0.1	0.08	0.06	nd	0.15	nd	0.02	1.1	0.18

ITE (MET)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	(.1	(.01	(.01	(.01	0.01	0.03	(.03	0.07	0.17	0.0011	(.03	(.005	(.01	(.1	0.08
PH5	(.1	(.01	0.1	(.01	(.01	(.01	(.01	(.01	(.03	0.04	0.02	0.0003	(.03	(.005	(.01	(.1	(.01
TCLP	0.1	nd	0.2	nd	0.01	0.01	0.01	0.03	0.2	0.08	0.10	nd	nd	nd	0.01	nd	0.18

ORSPAR (MET)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.2	(.01	(.01	(.01	0.14	0.03	(.03	0.72	0.42	0.0002	(.03	(.005	(.01	(.1	0.25
PH5	(.1	(.01	(.1	(.01	(.01	(.01	0.02	(.01	(.03	0.64	0.18	0.0004	(.03	(.005	(.01	(.1	0.14
TCLP	0.1	nd	0.5	nd	0.01	nd	0.21	0.04	0.1	0.64	0.28	nd	0.03	nd	0.01	nd	0.40

ROCHROME (HC)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.1	(.01	(.01	0.37	(.01	8.9	(.03	0.23	5.40	0.0006	0.08	(.005	(.01	(.1	0.03
PH5	(.1	(.01	(.1	(.01	(.01	(.01	(.01	(.01	(.03	0.16	2.64	0.0006	0.05	(.005	(.01	(.1	0.01
TCLP	nd	nd	0.3	nd	0.01	0.90	0.02	8.55	0.1	0.10	6.60	nd	0.11	nd	0.02	0.1	0.16

NITE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.6	(.01	(.01	(.01	0.01	0.04	(.03	0.42	15.3	0.0003	0.03	(.005	0.01	(.1	0.05
PH5	(.1	(.01	0.1	(.01	(.01	(.01	(.01	0.02	(.03	0.10	0.09	0.0003	(.03	(.005	(.01	(.1	0.02
TCLP	0.2	nd	0.3	nd	0.01	0.04	0.03	0.14	0.1	0.14	10.5	nd	nd	nd	0.01	0.1	0.17

ROMANGANESE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.005	(.1	(.01	(.01	(.01	(.01	(.01	0.03	0.04	1.37	(.0005	(.03	(.005	(.01	(.1	0.01
PH5	(.1	(.005	(.1	(.01	(.01	(.01	(.01	(.01	(.03	0.02	0.38	(.0005	(.03	(.005	(.01	(.1	(.01
TCLP	0.3	nd	0.2	nd	0.02	0.01	0.03	0.04	0.1	0.13	988.	nd	0.05	nd	0.01	nd	0.06

RROCHROME (LC)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	(.1	(.01	(.01	0.08	(.01	0.47	(.03	0.06	0.34	(.0002	(.03	(.005	(.10	(.1	0.03
PH5	(.1	(.01	(.1	(.01	(.01	0.10	(.01	0.81	(.03	0.04	0.25	(.0002	(.03	(.005	(.01	(.1	0.02
TCLP	0.3	nd	0.3	nd	0.01	1.28	0.02	2.00	0.1	0.08	0.93	nd	0.04	nd	0.01	nd	0.14

ROMITE (REF)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	(.1	(.01	(.01	0.01	0.01	(.01	(.03	11.24	5.20	0.0003	0.38	(.005	(.01	(.1	0.03
PH5	(.1	(.01	(.1	(.01	(.01	0.01	(.01	(.01	(.03	6.18	0.80	(.0002	0.05	(.005	(.01	(.1	0.02
TCLP	0.1	nd	0.4	nd	0.01	0.34	0.02	0.09	0.1	11.3	8.40	nd	0.49	nd	0.01	nd	0.14

AUXITE (REF)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	(.1	(.01	(.01	(.01	0.02	0.26	(.03	0.39	0.17	(.0002	(.03	(.005	0.01	(.1	0.29
PH5	(.1	(.01	0.1	(.01	(.01	(.01	0.01	0.08	(.03	0.40	0.42	0.0009	(.03	(.005	0.01	(.1	0.17
TCLP	0.1	nd	0.4	nd	0.01	nd	0.04	0.14	0.1	0.37	0.18	nd	0.04	nd	0.01	nd	0.41

JORSPAR (ACID)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	(.01	0.9	(.01	(.02	(.01	0.47	0.10	15.3	1.03	1.62	0.0002	(.03	(.005	(.01	(.1	4.8
PH5	(.1	(.01	1.0	(.01	0.01	(.01	0.20	0.01	10.2	0.60	1.12	0.0006	(.03	(.005	(0.1	(.1	3.6
TCLP	nd	nd	1.8	nd	0.04	nd	0.35	0.08	13.8	0.81	1.17	nd	0.05	nd	0.02	nd	5.20

FERROMANGANESE (H	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	(.1	0.146	0.1	(.01	(.01	0.21	0.05	910.	(.03	0.12	5250.	0.0008	3.34	(.025	(.01	(.1	0.63
PH5	0.1	0.018	0.3	(.01	(.01	0.02	(.01	0.04	(.03	0.15	2200.	0.0009	0.05	(.005	0.01	(.1	(.01
TCLP	0.1	nd	0.9	nd	0.02	0.01	0.01	1.22	0.1	0.12	850.	nd	nd	nd	0.01	nd	0.05

RYL CONCENTRATE	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	0.2	(.005	0.1	0.42	0.01	0.02	0.03	2.59	0.76	132.	6.50	(.0005	0.06	(.005	0.01	(.1	1.56
PH5	0.4	(.005	0.3	0.12	0.01	(.01	0.01	0.06	0.09	66.	2.34	(.0005	(.03	(.005	0.01	(.1	0.59
TCLP	0.3	nd	0.7	0.32	0.02	0.01	0.47	0.09	0.2	3.76	3.34	nd	0.04	nd	0.02	nd	0.53

CHROMITE (MET)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	0.4	(.005	0.4	(.01	0.01	0.22	0.01	0.82	0.11	76.5	3.60	(.0005	3.84	(.005	(.01	(.1	0.22
PH5	0.1	(.005	0.2	(.01	(.01	0.03	(.01	0.02	0.37	44.8	1.03	(.0005	1.57	(.005	(.01	(.1	0.03
TCLP	nd	0.175	0.5	nd	0.02	0.69	0.02	0.52	0.1	61.1	0.63	nd	1.21	nd	0.01	0.1	0.18

NGANESE (MET)	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mg	Mn	Hg	Ni	Se	Ag	V	Zn
PH4	0.2	(.005	(.1	(.01	(.01	(.01	(.01	(.01	.33	1.30	1.46	(.0005	0.09	(.005	(.01	(.1	0.041
PH5	(.1	(.005	(.1	(.01	(.01	(.01	(.01	(.01	0.53	1.02	0.01	(.0005	(.03	(.005	(.01	(.1	(.01
TCLP	0.1	nd	0.3	nd	0.01	0.01	0.02	0.05	0.1	0.10	1.26	nd	0.05	nd	0.01	0.1	0.19

ALL RESULTS GIVEN IN MILLIGRAMS PER LITER mg/l

APPENDIX 4 - LABORATORY ANALYSIS REPORTS

GANNETT FLEMING ENVIRONMENTAL LABORATORY
(Division of Gannett Fleming Environmental Engineers, Inc.)
209 SENATE AVENUE
CAMP HILL, PA 17011
(717)763-7211
PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18200
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-1**
Date Collected: 01/19/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.3	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.05	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.38	mg/l
Manganese, Total	1.39	mg/l
Mercury, Total	0.0006	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.02	mg/l

COMMENTS:
Material Name : Aluminum Oxide - Crude Abrasive
Location of Material : NSPCC Mechanicsburg
Country of Origin : Canada
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

GANNETT FLEMING ENVIRONMENTAL LABORATORY
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CAMP HILL, PA 17011
(717)763-7211
PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18199
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-1**
Date Collected: 01/19/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.2	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.38	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.16	mg/l
Manganese, Total	0.97	mg/l
Mercury, Total	0.0004	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material : Aluminum Oxide - Crude Abrasive
Location of Material : NSPCC Mechanicsburg
Country of Origin : Canada
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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(717)763-7211
PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32290
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

L A B O R A T O R Y A N A L Y S I S R E P O R T

March 6, 1991

Sample Identification: DNS-1
Date Collected: 02/19/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.2	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.5	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.02	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.03	mg/l	.01	EPA 220.1
Iron, Total	1.64	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.12	mg/l	.01	EPA 242.1
Manganese, Total	1.06	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.02	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.19	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Aluminum Oxide - Crude Abrasive
Location of Material : NSPCC Mechanicsburg
Country of Origin : Canada
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

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PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18202
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-2**
Date Collected: 01/18/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	30.5	mg/l
Manganese, Total	0.25	mg/l
Mercury, Total	0.0010	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.025	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.06	mg/l

COMMENTS:
Material Name : Celestite
Location of Material : DLA/DNSC Marietta, PA
Country of Origin : Spain
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18201
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-2**
Date Collected: 01/18/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	0.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.03	mg/l
Iron, Total	0.04	mg/l
Lead, Total	0.13	mg/l
Magnesium, Total	58.4	mg/l
Manganese, Total	2.12	mg/l
Mercury, Total	0.0006	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.025	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.11	mg/l

COMMENTS:
Material Name : Celestite
Location of Material : DLA/DNSC Marrietta, PA
Country of Origin : Spain
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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(717)763-7211
PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32291
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

L A B O R A T O R Y A N A L Y S I S R E P O R T

March 6, 1991

Sample Identification: **DN8-2**
Date Collected: 01/18/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.2	mg/l	.1	EPA 204.1
Arsenic,Total	0.008	mg/l	.005	EPA 206.2
Barium, Total	0.2	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.03	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.03	mg/l	.01	EPA 220.1
Iron, Total	0.06	mg/l	.02	EPA 236.1
Lead, Total	0.4	mg/l	.1	EPA 239.1
Magnesium, Total	51.0	mg/l	.01	EPA 242.1
Manganese, Total	1.00	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.07	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.02	mg/l	.01	EPA 272.1
Vanadium, Total	0.1	mg/l	.1	EPA 286.1
Zinc, Total	0.24	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Celestite
Location of Material : DLA/DNSC Marietta, PA
Country of Origin : Spain
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18204
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-3**
Date Collected: 01/18/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	5.84	mg/l
Manganese, Total	0.01	mg/l
Mercury, Total	0.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.36	mg/l

COMMENTS:
Material Name : Manganese Dioxide - Battery Grade
Location of Material : DLA/DNSC Marietta, PA
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

GANNETT FLEMING ENVIRONMENTAL LABORATORY
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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18203
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-3**
Date Collected: 01/18/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	0.048	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	0.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.02	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	19.5	mg/l
Manganese, Total	2.32	mg/l
Mercury, Total	0.0009	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	16.2	mg/l

COMMENTS:
Material Name : Manganese Dioxide - Battery Grade
Location of Material : DLA/DNSC Marietta, PA
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

GANNETT FLEMING, INC.
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PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32292
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

L A B O R A T O R Y A N A L Y S I S R E P O R T
March 6, 1991

Sample Identification: **DNS-3**
Date Collected: 02/18/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	0.040	mg/l	.005	EPA 206.2
Barium, Total	0.5	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.02	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.02	mg/l	.01	EPA 220.1
Iron, Total	0.05	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	11.1	mg/l	.01	EPA 242.1
Manganese, Total	0.12	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.04	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	8.10	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Manganese Dioxide - Battery Grade
Location of Material : DLA/DNSC Marietta, PA
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

GANNETT FLEMING ENVIRONMENTAL LABORATORY
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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18206
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-4**
Date Collected: 01/23/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	0.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.84	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.08	mg/l
Manganese, Total	0.07	mg/l
Mercury, Total	0.0011	mg/l
Nickel, Total	0.11	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	0.8	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material Name : Silicon Carbide
Location of Material : DLA/DNSC Somerville, NJ
Country of Origin : Canada
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laborator

David W. Lane, Laboratory Manager

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PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18205
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-4**
Date Collected: 01/23/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.2	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.02	mg/l
Iron, Total	1.12	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.07	mg/l
Manganese, Total	0.11	mg/l
Mercury, Total	0.0012	mg/l
Nickel, Total	0.14	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	0.8	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material Name : Silicon Carbide
Location of Material : DLA/DNSC Somerville, NJ
Country of Origin : Canada
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32293
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: DNS-4
Date Collected: 01/23/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.2	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.5	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.02	mg/l	.01	EPA 220.1
Iron, Total	0.94	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.08	mg/l	.01	EPA 242.1
Manganese, Total	0.06	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.15	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.02	mg/l	.01	EPA 272.1
Vanadium, Total	1.1	mg/l	.1	EPA 286.1
Zinc, Total	0.18	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Silicon Carbide
Location of Material : DLA/DNSC Somerville, NJ
Country of Origin : Canada
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18208
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-5**
Date Collected: 02/23/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.04	mg/l
Manganese, Total	0.02	mg/l
Mercury, Total	0.0003	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	<.01	mg/l

COMMENTS:
Material Name : Bauxite, Metalurgical
Location of Material : DLA/DNSC Baton Rouge, LA
Country of Origin : Indonesia
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18207
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-5**
Date Collected: 02/23/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.03	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.07	mg/l
Manganese, Total	0.17	mg/l
Mercury, Total	0.0011	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.08	mg/l

COMMENTS:
Material Name : Bauxite, Metalurgical
Location of Material : DLA/DNSC Baton Rouge, LA
Country of Origin : Indonesia
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32294
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT

March 6, 1991

Sample Identification: DN8-5
Date Collected: 02/23/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.2	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.01	mg/l	.01	EPA 220.1
Iron, Total	0.03	mg/l	.02	EPA 236.1
Lead, Total	0.2	mg/l	.1	EPA 239.1
Magnesium, Total	0.08	mg/l	.01	EPA 242.1
Manganese, Total	0.10	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.18	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Bauxite, Metalurgical
Location of Material : Baton Rouge, LA
Country of Origin : Indonesia
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18210
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-6**
Date Collected: 01/19/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	1.0	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	0.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.20	mg/l
Iron, Total	0.01	mg/l
Lead, Total	10.2	mg/l
Magnesium, Total	0.60	mg/l
Manganese, Total	1.12	mg/l
Mercury, Total	0.0006	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	3.6	mg/l

COMMENTS:
Material Name : Fluorspar, Acid Grade
Location of Material : DLA/DNSC Curtis Bay, MD
Country of Origin : Holland
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18209
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-6**
Date Collected: 01/19/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.9	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	0.02	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.47	mg/l
Iron, Total	0.10	mg/l
Lead, Total	15.3	mg/l
Magnesium, Total	1.03	mg/l
Manganese, Total	1.62	mg/l
Mercury, Total	0.0002	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	4.8	mg/l

COMMENTS:
Material Name : Fluorspar, Acid Grade
Location of Material : DLA/DNSC Curtis Bay, MD
Country of Origin : Holland
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32295
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DNS-6**
Date Collected: 02/19/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	None Detected	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	1.8	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.04	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.01	EPA 218.1
Copper, Total	0.35	mg/l	.01	EPA 220.1
Iron, Total	0.08	mg/l	.02	EPA 236.1
Lead, Total	13.8	mg/l	.1	EPA 239.1
Magnesium, Total	0.81	mg/l	.01	EPA 242.1
Manganese, Total	1.17	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.05	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.02	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	5.20	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Fluorspar, Acid Grade
Location of Material : DLA/DNSC Curtis Bay, MD
Country of Origin : Holland
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18212
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-7**
Date Collected: 02/03/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.16	mg/l
Manganese, Total	2.64	mg/l
Mercury, Total	0.0006	mg/l
Nickel, Total	0.05	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.01	mg/l

COMMENTS:
Material Name : Ferrochrome HC
Location of Material : DLA/DNSC Warren Depot
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18211
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-7**
Date Collected: 02/03/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.37	mg/l
Copper, Total	<.01	mg/l
Iron, Total	8.9	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.23	mg/l
Manganese, Total	5.40	mg/l
Mercury, Total	0.0006	mg/l
Nickel, Total	0.08	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material Name : Ferrochrome HC
Location of Material : DLA/DNSC Warren Depot
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32296
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: DNS-7
Date Collected: 02/03/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	None Detected	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.3	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	0.90	mg/l	.01	EPA 218.1
Copper, Total	0.02	mg/l	.01	EPA 220.1
Iron, Total	8.55	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.10	mg/l	.01	EPA 242.1
Manganese, Total	6.60	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.11	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.02	mg/l	.01	EPA 272.1
Vanadium, Total	0.1	mg/l	.1	EPA 286.1
Zinc, Total	0.16	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferrochrome HC
Location of Material : DLA/DNSC Warren Depot
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18214
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-8**
Date Collected: 02/09/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.02	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.10	mg/l
Manganese, Total	0.09	mg/l
Mercury, Total	0.0003	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.02	mg/l

COMMENTS:
Material Name : Kyanite
Location of Material : DLA/DNSC - New Haven
Country of Origin : India
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18213
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-8**
Date Collected: 02/09/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.6	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.04	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.42	mg/l
Manganese, Total	15.3	mg/l
Mercury, Total	0.0003	mg/l
Nickel, Total	0.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	0.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.05	mg/l

COMMENTS:
Material Name : Kyanite
Location of Material : DLA/DNSC - New Haven
Country of Origin : India
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32297
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

L A B O R A T O R Y A N A L Y S I S R E P O R T
March 6, 1991

Sample Identification: **DNS-8**
Date Collected: 02/09/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.2	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.3	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	0.04	mg/l	.01	EPA 218.1
Copper, Total	0.03	mg/l	.01	EPA 220.1
Iron, Total	0.14	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.14	mg/l	.01	EPA 242.1
Manganese, Total	10.5	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	0.1	mg/l	.1	EPA 286.1
Zinc, Total	0.17	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Kyanite
Location of Material : DLA/DNSC - New Haven
Country of Origin : India
Contract Number : DLA300-91-M-0020

These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18215
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-9**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.07	mg/l
Copper, Total	0.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	0.06	mg/l
Magnesium, Total	0.25	mg/l
Manganese, Total	5,530.	mg/l
Mercury, Total	0.0014	mg/l
Nickel, Total	7.30	mg/l
Selenium, Total	<.025	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material Name : Ferromanganese
Location of Material : DLA/DNSC - Ravenna A. A. Plant
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18216
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-9**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	0.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.02	mg/l
Copper, Total	0.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.37	mg/l
Manganese, Total	2,480.	mg/l
Mercury, Total	<.0002	mg/l
Nickel, Total	0.21	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	<.01	mg/l

COMMENTS:
Material Name : Ferromanganese
Location of Material : DLA/DNSC - Ravenna A. A. Plant
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32298
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DNS-9**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.3	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.2	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.02	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.03	mg/l	.01	EPA 220.1
Iron, Total	0.04	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.13	mg/l	.01	EPA 242.1
Manganese, Total	988.	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.05	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.06	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese
Location of Material : DLA/DNSC - Ravenna A A Plant
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18218
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-10**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.10	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.81	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.04	mg/l
Manganese, Total	0.25	mg/l
Mercury, Total	<.0002	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.02	mg/l

COMMENTS:
Material Name : Ferrochrome LC
Location of Material : Ravenna A. A. Plant
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18217
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-10**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.08	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.47	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.06	mg/l
Manganese, Total	0.34	mg/l
Mercury, Total	<.0002	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.10	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material Name : Ferrochrome LC
Location of Material : Ravenna A. A. Plant
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32299
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DNS-10**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.3	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.3	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	1.28	mg/l	.01	EPA 218.1
Copper, Total	0.02	mg/l	.01	EPA 220.1
Iron, Total	2.00	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.08	mg/l	.01	EPA 242.1
Manganese, Total	0.93	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.04	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.14	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferrochrome LC
Location of Material : Ravenna A. A. Plant
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18220
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-11**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	6.18	mg/l
Manganese, Total	0.80	mg/l
Mercury, Total	<.0002	mg/l
Nickel, Total	0.05	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.02	mg/l

COMMENTS:
Material Name : Chromite Refractory
Location of Material : Ravenna A. A. Plant
Country of Origin : Domestic
Contract : DLA300-89-C-0020

The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18219
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-11**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	11.24	mg/l
Manganese, Total	5.20	mg/l
Mercury, Total	0.0003	mg/l
Nickel, Total	0.38	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material Name : Chromite Refractory
Location of Material : Ravenna A. A. Plant
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

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Directorate of Stockpile Mgmnt
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Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32300
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

L A B O R A T O R Y A N A L Y S I S R E P O R T

March 6, 1991

Sample Identification: **DNA-11**
Date Collected: 02/02/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.4	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	0.34	mg/l	.01	EPA 218.1
Copper, Total	0.02	mg/l	.01	EPA 220.1
Iron, Total	0.09	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	11.3	mg/l	.01	EPA 242.1
Manganese, Total	8.40	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.49	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.14	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Chromite Refractory
Location of Material : Ravenne A. A. Plant
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18222
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-12**
Date Collected: 03/14/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.02	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.64	mg/l
Manganese, Total	0.18	mg/l
Mercury, Total	0.0004	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.14	mg/l

COMMENTS:
Material Name : Fluorspar Metalurgical
Location of Material : DLA/DNSC Clearfield UT
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18221
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-12**
Date Collected: 03/14/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.2	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.14	mg/l
Iron, Total	0.03	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.72	mg/l
Manganese, Total	0.42	mg/l
Mercury, Total	<.0002	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.25	mg/l

COMMENTS:
Material Name : Fluorspar Metalurgical
Location of Material : DLA/DNSC Clearfield UT
Country of Origin : Domestic
Contract : DLA300-89-C-0020

'The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32301
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DNS-12**
Date Collected: 03/14/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.5	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.01	EPA 218.1
Copper, Total	0.21	mg/l	.01	EPA 220.1
Iron, Total	0.04	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.64	mg/l	.01	EPA 242.1
Manganese, Total	0.28	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.03	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.40	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Fluorspar Matallurgical
Location of Material : DLA/DNSC Clearfield, UT
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18223
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-13**
Date Collected: 03/15/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	0.146	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.21	mg/l
Copper, Total	0.05	mg/l
Iron, Total	910.	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.12	mg/l
Manganese, Total	5,250.	mg/l
Mercury, Total	0.0008	mg/l
Nickel, Total	3.34	mg/l
Selenium, Total	<.025	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.63	mg/l

COMMENTS:
Material Name : FerroManganese (HC)
Location of Material : DLA/DNSC Clearfield, UT
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18224
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T
June 6, 1989

Sample Identification: **DNS-13**
Date Collected: 03/15/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	0.1	mg/l
Arsenic,Total	0.018	mg/l
Barium, Total	0.3	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.02	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.04	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.15	mg/l
Manganese, Total	2,200.	mg/l
Mercury, Total	0.0009	mg/l
Nickel, Total	0.05	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	0.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	<.01	mg/l

COMMENTS:
Material Name : FerroManganese (HC)
Location of Material : DLA/DNSC Clearfield, UT
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32302
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DN8-13**
Date Collected: 03/15/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.9	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.02	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.01	mg/l	.01	EPA 220.1
Iron, Total	1.22	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.12	mg/l	.01	EPA 242.1
Manganese, Total	850.	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.05	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese (HC)
Location of Material : DLA/DNSC CLearfield, UT
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18226
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

LABORATORY ANALYSIS REPORT
June 6, 1989

Sample Identification: **DNS-14**
Date Collected: 03/15/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.08	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.40	mg/l
Manganese, Total	0.42	mg/l
Mercury, Total	0.0009	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	0.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.17	mg/l

COMMENTS:
Material Name : Bauxite Refractory
Location of Material : DLA/DNSC Mira Loma CA
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45, No. 98, May 19, 1980.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly, DLA-NO

Client Number: 902
Project Number: 6498
Sample Number: 18225
Date Received: 05/05/89
Time Received: 12:30
Discard Date: 06/20/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

June 6, 1989

Sample Identification: **DNS-14**
Date Collected: 03/15/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.01	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.02	mg/l
Iron, Total	0.26	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.39	mg/l
Manganese, Total	0.17	mg/l
Mercury, Total	<.0002	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	0.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.29	mg/l

COMMENTS:
Material Name : Bauxite Refractory
Location of Material : DLA/DNSC Mira Loma CA
Country of Origin : Domestic
Contract : DLA300-89-C-0020

*The EP-Toxicity procedure was performed according to the Federal Register, Volume 45. No. 98, May 19, 1980. As the request of DLO, a deviation from the procedure was implemented by lowering the pH of the extract liquid to 4, rather than the prescribed pH of 5.

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32303
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DNS-14**
Date Collected: 03/15/89 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.4	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.01	EPA 218.1
Copper, Total	0.04	mg/l	.01	EPA 220.1
Iron, Total	0.14	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.37	mg/l	.01	EPA 242.1
Manganese, Total	0.18	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.04	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.41	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Bauxite Refractory
Location of Material : DLA/DNSC Mira Loma, CA
Country of Origin : Domestic
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19503
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 08/22/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

August 8, 1989

Sample Identification: **Pile 210** DNS-15
Date Collected: 7 /17/ 89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	0.4	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	0.3	mg/l
Beryllium, Total	0.12	mg/l
Cadmium, Total	0.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.06	mg/l
Lead, Total	0.09	mg/l
Magnesium, Total	66.	mg/l
Manganese, Total	2.34	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	0.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.59	mg/l

COMMENTS:
Material : Beryl Concentrates
Location of Material : Curtis Bay Depot, Baltimore, MD
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19502
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 08/22/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

August 8, 1989

Sample Identification: **Pile 210** DNS-15
Date Collected: 7/17/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	0.2	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	0.1	mg/l
Beryllium, Total	0.42	mg/l
Cadmium, Total	0.01	mg/l
Chromium, Total	0.02	mg/l
Copper, Total	0.03	mg/l
Iron, Total	2.59	mg/l
Lead, Total	0.76	mg/l
Magnesium, Total	132.	mg/l
Manganese, Total	6.50	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	0.06	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	0.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	1.56	mg/l

COMMENTS:
Material : Beryl Concentrates
Location of Material : Curtis Bay Depot, Baltimore, MD
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32304
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT
March 6, 1991

Sample Identification: **DNS-15**
Date Collected: 02/27/90 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.1	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.3	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	0.01	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.02	mg/l	.01	EPA 220.1
Iron, Total	0.05	mg/l	.02	EPA 236.1
Lead, Total	0.1	mg/l	.1	EPA 239.1
Magnesium, Total	0.10	mg/l	.01	EPA 242.1
Manganese, Total	1.26	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.05	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.01	mg/l	.01	EPA 272.1
Vanadium, Total	0.1	mg/l	.1	EPA 286.1
Zinc, Total	0.19	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Manganese (Metallurgical)
Location of Material : Curtis Bay - Pile 150
Country og Origin : Not Given
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19505
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 08/22/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

August 8, 1989

Sample Identification: **Pile 135** DNS-16
Date Collected: 7/17/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	0.1	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	0.2	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	0.03	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.02	mg/l
Lead, Total	0.37	mg/l
Magnesium, Total	44.8	mg/l
Manganese, Total	1.03	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	1.57	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.03	mg/l

COMMENTS:
Material : Chromite, Met Gr
Location of Material : Curtis Bay Depot, Baltimore, MD
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19504
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 08/22/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

August 8, 1989

Sample Identification: **Pile 135** DNS-16
Date Collected: 7/17/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	0.4	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	0.4	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	0.01	mg/l
Chromium, Total	0.22	mg/l
Copper, Total	0.01	mg/l
Iron, Total	0.82	mg/l
Lead, Total	0.11	mg/l
Magnesium, Total	76.5	mg/l
Manganese, Total	3.60	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	3.84	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.22	mg/l

COMMENTS:
Material : Chromite, Met Gr
Location of Material : Curtis Bay Depot, Baltimore, MD
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

GANNETT FLEMING, INC.
ENVIRONMENTAL LABORATORY
209 SENATE AVENUE
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(717)763-7211
PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32305
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

LABORATORY ANALYSIS REPORT

March 6, 1991

Sample Identification: **DNS-16**
Date Collected: 02/27/90 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	None Detected	mg/l	.1	EPA 204.
Arsenic,Total	0.175	mg/l	.005	EPA 206.
Barium, Total	0.5	mg/l	.1	EPA 208.
Beryllium, Total	None Detected	mg/l	.01	EPA 210.
Cadmium, Total	0.02	mg/l	.01	EPA 213.
Chromium, Total	0.69	mg/l	.01	EPA 218.
Copper, Total	0.02	mg/l	.01	EPA 220.
Iron, Total	0.52	mg/l	.02	EPA 236.
Lead, Total	0.1	mg/l	.1	EPA 239.
Magnesium, Total	61.1	mg/l	.01	EPA 242.
Manganese, Total	0.63	mg/l	.01	EPA 243.
Mercury, Total	None Detected	mg/l	.0005	EPA 245.
Nickel, Total	1.21	mg/l	.03	EPA 249.
Selenium, Total	None Detected	mg/l	.02	EPA 270.
Silver, Total	0.01	mg/l	.01	EPA 272.
Vanadium, Total	0.1	mg/l	.1	EPA 286.
Zinc, Total	0.18	mg/l	.01	EPA 289.

COMMENTS:
Material Name : Chromite (Metallurgical)
Location of Material : Curtis Bay - Pile 136
Country of Origin : Not Given
Contract Number : DLA300-91-M-0020

*These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19507
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 08/22/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

August 8, 1989

Sample Identification: **Pile 150** DNS-17
Date Collected: 7/17/89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	0.53	mg/l
Magnesium, Total	1.02	mg/l
Manganese, Total	0.01	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	<.01	mg/l

COMMENTS:
Material : Manganese Met Gr
Location of Material : Curtis Bay Depot, Baltimore, MD
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19506
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 08/22/89

L A B O R A T O R Y A N A L Y S I S R E P O R T

August 8, 1989

Sample Identification: **Pile 150** DNS-17
Date Collected: 7 /17 / 89 Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	0.2	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	0.33	mg/l
Magnesium, Total	1.30	mg/l
Manganese, Total	1.46	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	0.09	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.041	mg/l

COMMENTS:
Material : Manganese Met Gr
Location of Material : Curtis Bay Depot, Baltimore, MD
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202
Attn: Kevin Reilly,DNSC-OD,Suite 100

Client Number: 902
Project Number: 11701
Sample Number: 32306
Date Received: 02/04/91
Time Received: 12:30
Discard Date: 03/20/91

L A B O R A T O R Y A N A L Y S I S R E P O R T

March 6, 1991

Sample Identification: **DNS-17**
Date Collected: 11/27/90 Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
DLA REQUESTED TCLP ANALYSES				
Antimony, Total	0.3	mg/l	.1	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	0.7	mg/l	.1	EPA 208.1
Beryllium, Total	0.32	mg/l	.01	EPA 210.1
Cadmium, Total	0.02	mg/l	.01	EPA 213.1
Chromium, Total	0.01	mg/l	.01	EPA 218.1
Copper, Total	0.47	mg/l	.01	EPA 220.1
Iron, Total	0.09	mg/l	.02	EPA 236.1
Lead, Total	0.2	mg/l	.1	EPA 239.1
Magnesium, Total	3.76	mg/l	.01	EPA 242.1
Manganese, Total	3.34	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	0.04	mg/l	.03	EPA 249.1
Selenium, Total	None Detected	mg/l	.02	EPA 270.2
Silver, Total	0.02	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.1	EPA 286.1
Zinc, Total	0.53	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Beryl Ore - 13.9%
Location of Material : Curtis Bay - Pile 213
Country of Origin : Not Given
Contract Number : DLA300-91-M-0020

These analyses were performed on the TCLP Leachate of the sample described above. The TCLP Leachate procedure was performed according to 40 CFR Part 261.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

APPENDIX 5 - Field Size Analysis

GANNETT FLEMING ENVIRONMENTAL LABORATORY
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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19972
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 09/14/89

LABORATORY ANALYSIS REPORT
August 31, 1989

Sample Identification: **Ferrochrome** 5" size
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.02	mg/l
Manganese, Total	<.01	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	<.01	mg/l

COMMENTS:
Material : Ferro Chrome
Location of Material : Pile # 17
Country of Origin : Germany
Contract : DLA300-89-C-0020

*At the request of the client, this analysis was performed under a modification of the EP-Toxicity Test Procedure referenced under the Federal Register, Volume 45, No. 98, May 19, 1980. The leachate was performed on a large size sample typifing the actual size of the material as it existed in the stock piles. The sample was not crushed. The sample was mixed with 16 times it's weight in water in a 150 gallon nalgene tank. The pH was maintained at 4.0 and stirred with a large mixer for 24 hours. Compressed air was fed into the tank while the mixing took place.

Gannett Fleming Environmental Laboratory

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19970
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 09/14/89

LABORATORY ANALYSIS REPORT
August 31, 1989

Sample Identification: **Ferrochrome** 5" size
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	0.02	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.05	mg/l
Manganese, Total	<.01	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.01	mg/l

COMMENTS:
Material : Ferrochrome
Location of Material : NOT GIVEN
Country of Origin : NOT GIVEN
Contract : DLA300-89-C-0020

*At the request of the client, this analysis was performed under a modification of the EP-Toxicity Test Procedure referenced under the Federal Register, Volume 45, No. 98, May 19, 1980. The leachate was performed on a large size sample typifing the actual size of the material as it existed in the stock piles. The sample was not crushed. The sample was mixed with 16 times it's weight in water in a 150 gallon nalgene tank. The pH was maintained at 5.0 and stirred with a large mixer for 24 hours. Compressed air was fed into the tank while the mixing took place.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 20099
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 09/14/89

LABORATORY ANALYSIS REPORT
August 31, 1989

Sample Identification: **Ferromanganese** 5" size
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 5)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.02	mg/l
Manganese, Total	0.38	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	<.01	mg/l

COMMENTS:
material: Ferromanganese
Location of Material: Clearfield Depot; Pile #7
Country of Origin: Japan
Contract: DLA300-89-0020

*At the request of the client, this analysis was performed under a modification of the EP-Toxicity Test Procedure referenced under the Federal Register, Volume 45, No. 98, May 19, 1980. The leachate was performed on a large size sample typifing the actual size of the material as it existed in the stock piles. The sample was not crushed. The sample was mixed with 16 times it's weight in water in a 150 gallon nalgene tank. The pH was maintained at 5.0 and stirred with a large mixer for 24 hours. Compressed air was fed into the tank while the mixing took place.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Directorate of Stockpile Mgmnt
18th and F Street, N. W.
Washington, DC 20405
Attn: F. Kevin Reilly DLA-NO

Client Number: 902
Project Number: 7014
Sample Number: 19971
Date Received: 07/18/89
Time Received: 09:48
Discard Date: 09/14/89

LABORATORY ANALYSIS REPORT
August 31, 1989

Sample Identification: **Ferromanganese** 5" size
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	UNITS
EP-TOXICITY LEACHATE (PH TO 4)		
Antimony, Total	<.1	mg/l
Arsenic,Total	<.005	mg/l
Barium, Total	<.1	mg/l
Beryllium, Total	<.01	mg/l
Cadmium, Total	<.01	mg/l
Chromium, Total	<.01	mg/l
Copper, Total	<.01	mg/l
Iron, Total	<.01	mg/l
Lead, Total	<.03	mg/l
Magnesium, Total	0.04	mg/l
Manganese, Total	1.37	mg/l
Mercury, Total	<.0005	mg/l
Nickel, Total	<.03	mg/l
Selenium, Total	<.005	mg/l
Silver, Total	<.01	mg/l
Vanadium, Total	<.1	mg/l
Zinc, Total	0.01	mg/l

COMMENTS:
Material : Ferromanganese
Location of Material : Clearfield Depot; Pile # 7
Country of Origin : Japan
Contract : DLA300-89-0020

*At the request of the client, this analysis was performed under a modification of the EP-Toxicity Test Procedure referenced under the Federal Register, Volume 45, No. 98, May 19, 1980. The leachate was performed on a large size sample typifing the actual size of the material as it existed in the stock piles. The sample was not crushed. The sample was mixed with 16 times it's weight in water in a 150 gallon nalgene tank. The pH was maintained at 4.0 and stirred with a large mixer for 24 hours. Compressed air was fed into the tank while the mixing took place.

Gannett Fleming Environmental Laboratory

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Defense Logistics Agency DLA-N
Attn: Kevin Reilly, DNSC-OD
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202

Client Number: 902
Project Number: 15043
Sample Number: 42144
Date Received: 03/25/92
Time Received: 12:00
Discard Date: 05/22/92

LABORATORY ANALYSIS REPORT
May 8, 1992

Sample Identification: **Ferromanganese - 3" size**
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
EP-TOXICITY LEACHATE PH-5				
Antimony, Total	None Detected	mg/l	.2	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	None Detected	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	None Detected	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.05	EPA 218.1
Copper, Total	None Detected	mg/l	.02	EPA 220.1
Iron, Total	0.05	mg/l	.03	EPA 236.1
Lead, Total	None Detected	mg/l	.1	EPA 239.1
Magnesium, Total	0.05	mg/l	.01	EPA 242.1
Manganese, Total	1.25	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.04	EPA 249.1
Selenium, Total	None Detected	mg/l	.005	EPA 270.2
Silver, Total	None Detected	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.2	EPA 286.1
Zinc, Total	0.02	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese, High Carbon
Location : Pile # 7, Clearfield Federal Depot, UT
Weight : 7 lbs. 5.0 oz.
Contract : DLA300-92-M-0040

*These analyses were performed on the EP-Toxicity Leachate of the sample identified above. The leaching procedure was conducted according to the EPA Solid Waste Manual SW-846 Method 1310 in reference to 40 CFR Part 261. At The request of DLA, the procedure was modified by processing the sample as received, without reducing the sample size to pass a 9.5mm seive.

Gannett Fleming, Inc.

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Defense Logistics Agency DLA-N
Attn: Kevin Reilly, DNSC-OD
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202

Client Number: 902
Project Number: 15043
Sample Number: 42145
Date Received: 03/25/92
Time Received: 12:00
Discard Date: 05/22/92

LABORATORY ANALYSIS REPORT
May 8, 1992

Sample Identification: **Ferromanganese - 3" size**
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
EP-TOXICITY LEACHATE PH - 4				
Antimony, Total	None Detected	mg/l	.2	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	None Detected	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	None Detected	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.05	EPA 218.1
Copper, Total	0.03	mg/l	.02	EPA 220.1
Iron, Total	0.05	mg/l	.03	EPA 236.1
Lead, Total	None Detected	mg/l	.1	EPA 239.1
Magnesium, Total	0.05	mg/l	.01	EPA 242.1
Manganese, Total	4.85	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.04	EPA 249.1
Selenium, Total	None Detected	mg/l	.005	EPA 270.2
Silver, Total	None Detected	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.2	EPA 286.1
Zinc, Total	0.02	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese, High Carbon
Location : Pile # 7, Clearfield Federal Depot, UT
Weight : 7 lbs. 5.0 oz.
Contract : DLA300-92-M-0040

*These analyses were performed on the EP-Toxicity Leachate of the sample identified above. The leaching procedure was conducted according to the EPA Solid Waste Manual SW-846 Method 1310 in reference to 40 CFR Part 261. At the request of DLA, the procedure was modified by processing the sample as received, without reducing the sample size to pass a 9.5 mm seive. Additionally, the pH of the leachate was maintained at pH 4 during the leaching procedure.

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(717)763-7211
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Defense Logistics Agency DLA-N
Attn: Kevin Reilly, DNSC-OD
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202

Client Number: 902
Project Number: 15043
Sample Number: 42142
Date Received: 03/25/92
Time Received: 12:00
Discard Date: 05/22/92

LABORATORY ANALYSIS REPORT
May 8, 1992

Sample Identification: **Ferromanganese - 2" size**
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
EP-TOXICITY LEACHATE PH-5				
Antimony, Total	None Detected	mg/l	.2	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	None Detected	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	None Detected	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.05	EPA 218.1
Copper, Total	None Detected	mg/l	.02	EPA 220.1
Iron, Total	0.04	mg/l	.03	EPA 236.1
Lead, Total	None Detected	mg/l	.1	EPA 239.1
Magnesium, Total	0.07	mg/l	.01	EPA 242.1
Manganese, Total	1.63	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.04	EPA 249.1
Selenium, Total	None Detected	mg/l	.005	EPA 270.2
Silver, Total	None Detected	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.2	EPA 286.1
Zinc, Total	0.01	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese, High Carbon
Location : Pile # 7, Clearfield Federal Depot, UT
Weight : 2 lbs 2.5 oz.
Contract : DLA300-92-M-0040

These analyses were performed on the EP-Toxicity Leachate of the sample identified above. The leaching procedure was conducted according to the EPA Solid Waste Manual SW-846 Method 1310 in reference to 40 CFR Part 261. At The request of DLA, the procedure was modified by processing the sample as received, without reducing the sample size to pass a 9.5mm seive.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

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Defense Logistics Agency DLA-N
Attn: Kevin Reilly, DNSC-OD
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202

Client Number: 902
Project Number: 15043
Sample Number: 42143
Date Received: 03/25/92
Time Received: 12:00
Discard Date: 05/22/92

LABORATORY ANALYSIS REPORT
May 8, 1992

Sample Identification: **Ferromanganese - 2" size**
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
EP-TOXICITY LEACHATE PH = 4				
Antimony, Total	None Detected	mg/l	.2	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	None Detected	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	None Detected	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.05	EPA 218.1
Copper, Total	None Detected	mg/l	.02	EPA 220.1
Iron, Total	0.04	mg/l	.03	EPA 236.1
Lead, Total	None Detected	mg/l	.1	EPA 239.1
Magnesium, Total	0.09	mg/l	.01	EPA 242.1
Manganese, Total	10.3	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.04	EPA 249.1
Selenium, Total	None Detected	mg/l	.005	EPA 270.2
Silver, Total	None Detected	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.2	EPA 286.1
Zinc, Total	0.03	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese, High Carbon
Location : Pile # 7, Clearfield Federal Depot, UT
Weight : 2 lbs. 2.5 oz.
Contract : DLA300-92-M-0040

*These analyses were performed on the EP-Toxicity Leachate of the sample identified above. The leaching procedure was conducted according to the EPA Solid Waste Manual SW-846 Method 1310 in reference to 40 CFR Part 261. At the request of DLA, the procedure was modified by processing the sample as received, without reducing the sample size to pass a 9.5 mm seive. Additionally, the pH of the leachate was maintained at pH 4 during the leaching procedure.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

GANNETT FLEMING, INC.
ENVIRONMENTAL LABORATORY
209 SENATE AVENUE
CAMP HILL, PA 17011
(717)763-7211
PA DER Certification No. 22-133

Defense Logistics Agency DLA-N
Attn: Kevin Reilly, DNSC-OD
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202

Client Number: 902
Project Number: 15043
Sample Number: 42140
Date Received: 03/25/92
Time Received: 12:00
Discard Date: 05/22/92

LABORATORY ANALYSIS REPORT
May 8, 1992

Sample Identification: **Ferromanganese - 1" size**
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
EP-TOXICITY LEACHATE PH-5				
Antimony, Total	None Detected	mg/l	.2	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	None Detected	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	None Detected	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.05	EPA 218.1
Copper, Total	None Detected	mg/l	.02	EPA 220.1
Iron, Total	0.04	mg/l	.03	EPA 236.1
Lead, Total	None Detected	mg/l	.1	EPA 239.1
Magnesium, Total	0.07	mg/l	.01	EPA 242.1
Manganese, Total	2.60	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.04	EPA 249.1
Selenium, Total	None Detected	mg/l	.005	EPA 270.2
Silver, Total	None Detected	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.2	EPA 286.1
Zinc, Total	0.01	mg/l	.01	EPA 289.1

COMMENTS:
Material Name : Ferromanganese, High Carbon
Location : Pile # 7, Clearfield Federal Depot, UT
Weight : 0 lbs, 5.0 oz.
Contract : DLA300-92-M-0040

These analyses were performed on the EP-Toxicity Leachate of the sample identified above. The leaching procedure was conducted according to the EPA Solid Waste Manual SW-846 Method 1310 in reference to 40 CFR Part 261. At The request of DLA, the procedure was modified by processing the sample as received, without reducing the sample size to pass a 9.5mm seive.

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Defense Logistics Agency DLA-N
Attn: Kevin Reilly, DNSC-OD
Directorate of Stockpile Mgmnt
1745 Jefferson Davis Highway
Arlington, VA 22202

Client Number: 902
Project Number: 15043
Sample Number: 42141
Date Received: 03/25/92
Time Received: 12:00
Discard Date: 05/22/92

LABORATORY ANALYSIS REPORT
May 8, 1992

Sample Identification: **Ferromanganese - 1" size**
Date Collected: / / Time: Collected By:

ANALYSIS	RESULTS	MEASUREMENT UNITS	DETECTION LIMITS	ANALYSIS METHOD
EP-TOXICITY LEACHATE PH - 4				
Antimony, Total	None Detected	mg/l	.2	EPA 204.1
Arsenic,Total	None Detected	mg/l	.005	EPA 206.2
Barium, Total	None Detected	mg/l	.1	EPA 208.1
Beryllium, Total	None Detected	mg/l	.01	EPA 210.1
Cadmium, Total	None Detected	mg/l	.01	EPA 213.1
Chromium, Total	None Detected	mg/l	.05	EPA 218.1
Copper, Total	None Detected	mg/l	.02	EPA 220.1
Iron, Total	None Detected	mg/l	.03	EPA 236.1
Lead, Total	None Detected	mg/l	.1	EPA 239.1
Magnesium, Total	0.04	mg/l	.01	EPA 242.1
Manganese, Total	12.3	mg/l	.01	EPA 243.1
Mercury, Total	None Detected	mg/l	.0005	EPA 245.1
Nickel, Total	None Detected	mg/l	.04	EPA 249.1
Selenium, Total	None Detected	mg/l	.005	EPA 270.2
Silver, Total	None Detected	mg/l	.01	EPA 272.1
Vanadium, Total	None Detected	mg/l	.2	EPA 286.1
Zinc, Total	0.05	mg/l	.01	EPA 289.1

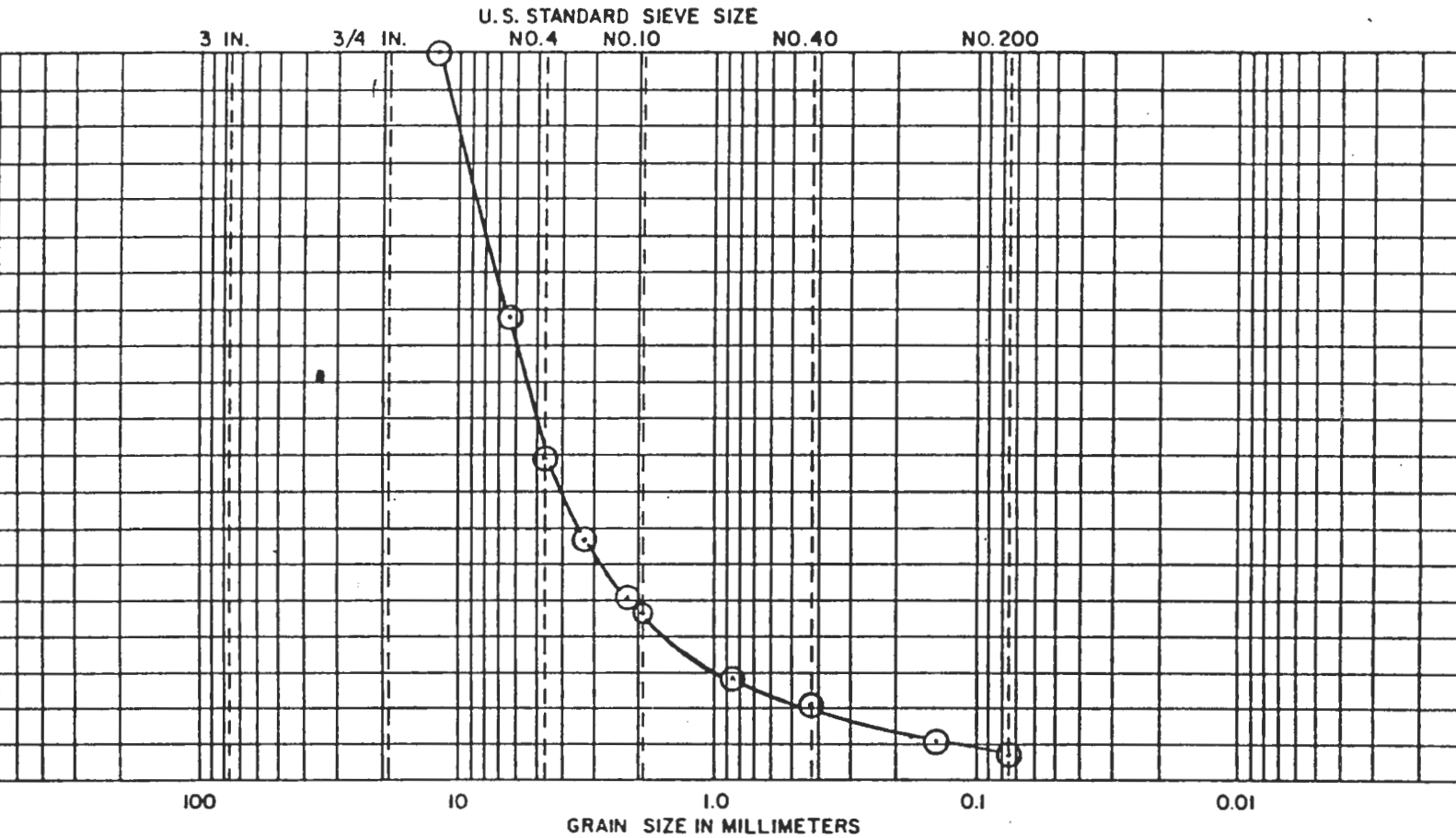
COMMENTS:
Material Name : Ferromanganese, High Carbon
Location : Pile # 7, Clearfield Federal Depot, UT
Weight : 0 lbs. 5.0 oz.
Contract : DLA-92-M-0040

*These analyses were performed on the EP-Toxicity Leachate of the sample identified above. The leaching procedure was conducted according to the EPA Solid Waste Manual SW-846 Method 1310 in reference to 40 CFR Part 261. At the request of DLA, the procedure was modified by processing the sample as received, without reducing the sample size to pass a 9.5 mm seive. Additionally, the pH of the leachate was maintained at pH 4 during the leaching procedure.

Gannett Fleming, Inc.

David W. Lane, Laboratory Manager

APPENDIX 6 - GRADATION CURVES OF TCLP TEST MATERIAL (actual)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Depth	Classification	Nat. WC	LL	PL	PI	Gs
--	--	--	--	--	--	--

d
1st. Trial

SIFICATION TEST - GRADATION CURVES

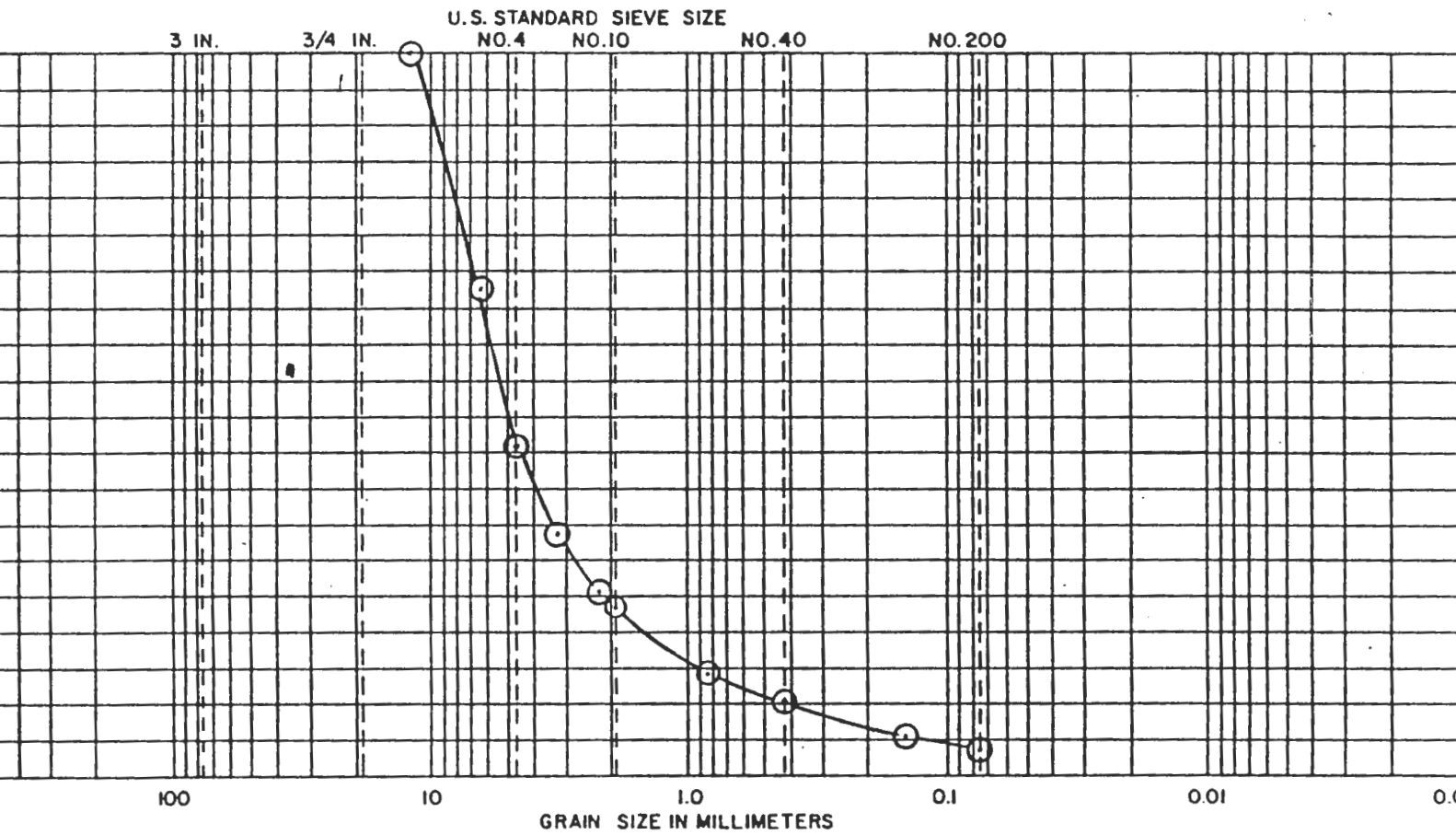
GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: # 15043

Area: DLA/DNSC CLEARFIELD, UT.

Sample # 42137

Date: 4/14/1992 Tested By: KAA



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Depth	Classification	Nat. WC	LL	PL	PI	Gs
--	--	--	--	--	--	--

2nd. Trial

FICATION TEST – GRADATION CURVES

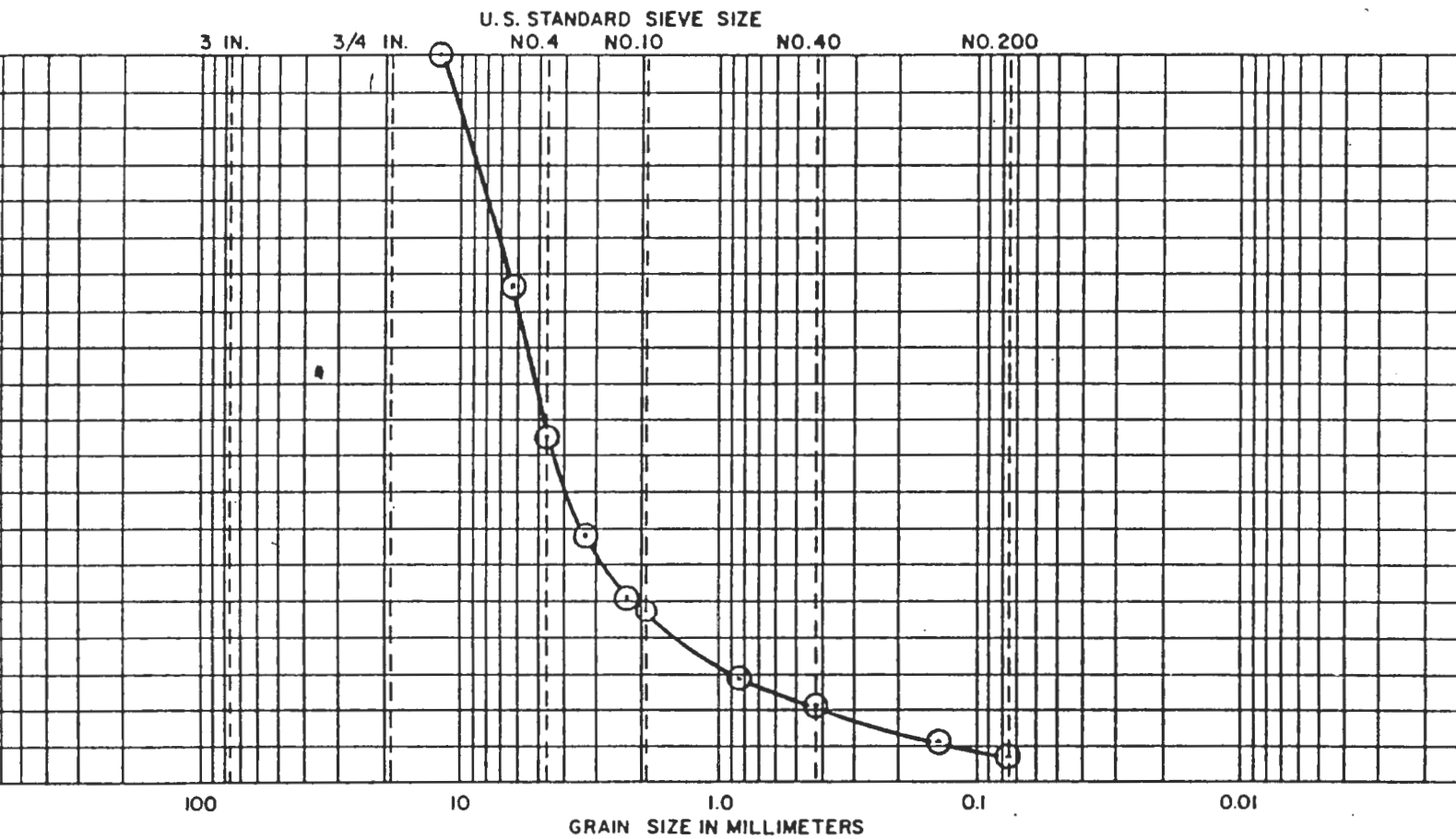
GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: # 15043

Area: DLA/DNSC CLEARFIELD, UT.

Sample # 42138

Date: 4/14/1992 Tested By: KAA



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Depth	Classification	Nat. WC	LL	PL	PI	Gs
--	--	--	--	--	--	--

GANNETT FLEMING GEOTECHNICAL LABORATORY

Project: # 15043

Area: DLA/DNSC CLEARFIELD, UT.

Sample # 42139

Date: 4/14/1992 Tested By: KAA

d
3rd. Trial

SIFICATION TEST - GRADATION CURVES

APPENDIX 7 - MATERIALS INSPECTION AND QUALITY CONTROL

PMD P 4400.1
APRIL 30, 1970

MATERIALS INSPECTION AND QUALITY CONTROL

A GSA HANDBOOK

GENERAL SERVICES ADMINISTRATION
WASHINGTON, D. C. 20405

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CHAPTER 4. SAMPLING

PART 1. GENERAL

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CHAPTER 4. SAMPLING

PART 1. GENERAL

1. Scope. This part describes the importance of sampling as an inspection function; defines terms applicable to the sampling function; outlines steps to be taken in the collection of samples to determine value and quality of materials offered for inspection; and is intended to standardize, insofar as possible, the sampling methods to be used by PMDS Inspection Division and by the contractors performing this service for PMDS.

2. Importance of sampling.

a. Very few defense materials offered for delivery warrant the costly and time-consuming process of piece-by-piece inspection. Sampling is therefore usually the first and most important step which is taken in the actual inspection of material. Inspection, analysis, and testing, no matter how accurate, give solely the composition and quality of the sample itself. It is obvious that the most accurate analysis is of little value if samples are taken in such manner that they are not representative of the lot inspected. Regardless of the accuracy of the analysis of the final sample or the care with which the examination or appraisal is made, inaccurate or careless sampling may lead to improper classification or evaluation, to improper acceptance or rejection of material, and often to litigation. It follows then, that the work of the sampler is just as important as that of the analyst or examiner.

b. The degree to which a sample may be representative of a total shipment or lot will depend not only on the methods used, but even more on the care exercised by the person who samples. No directions for sampling, however explicit, can take the place of judgment, skill, previous experience, and conscientiousness on the part of the person doing the sampling. The sampler's judgment and ability are of greater value because instructions cannot cover every point or combination of circumstances encountered on each inspection.

3. Definitions.

a. Sampling. Defined as the process of securing a representative portion of materials for the purpose of gaining information as to the composition of the whole by investigation of the part. The correct sampling of a lot of material is the process of obtaining from it a smaller quantity

which contains unchanged percentages of all constituents of the lot sampled. The object of sampling is to obtain this small representative portion for inspection, test, or analysis to determine the type, quality, or composition, and therefore the acceptability and unit value of the total lot inspected.

b. Gross Sample. The total quantity of material which has been withdrawn by means of mechanical, hand-tool samplers, or by grab methods from the material tendered for inspection.

c. Coning and Quartering. The means of reducing the gross sample to the small samples, for analysis or other determination of the type, quality, or composition of the lot being inspected. Whenever a mechanical means is available for accomplishing this or any part of this reduction of the sample quantity and/or particle size, such mechanical means shall be used.

d. Laboratory Sample. The important small sample to be submitted to a laboratory, as required, for the proper determination of the lot, unless the gross sample is required to be sent to the laboratory.

4. Selection and control of samples.

a. Samples of material for analysis, test, or appraisal shall be selected by or under the supervision of the Inspector. When sampling is performed under a service contract, the Inspector shall be present at the time sampling is started and shall spot check frequently thereafter. He shall take all necessary measures to assure himself that sampling is performed in accordance with terms of the contract, but shall not take samples himself or otherwise interfere with the service contractor's sampling procedure.

b. Suppliers shall not be permitted to handle samples of material, except in the presence of the Inspector, nor shall they interfere with the service contractor's performance. If shipment to a laboratory is required, samples must be forwarded to the laboratory by the Inspector and not by the supplier. However, when sampling is performed under service contract, the service contractor will forward the samples. The selection and preparation of representative samples from shipments or lots is often laborious and expensive; therefore, a close check or control shall be maintained on all samples which must be submitted to laboratories for testing.

5. Physical tests and chemical analyses. The Inspector shall conduct, supervise, or witness required tests in accordance with the methods prescribed in the contract or applicable specifications. Where the supplier has no facilities for making required physical tests, they shall be made at a laboratory acceptable to the Inspector. When GSA laboratories cannot perform the necessary tests and there is no commercial service contract in effect to do the work, arrangements should be made for testing under service contracts or agreements with qualified laboratories within the region making the inspection.

PART 2. BASIC SAMPLING PROCEDURES

6. Purpose. This part prescribes procedures for the preparation for sampling, obtaining of a representative sample, care of samples and equipment, forwarding of samples for analyses and tests, and describes factors affecting the sampling method and sample size.

7. Preparation for sampling.

a. Weight Check. At least one percent of containers in each lot of packaged materials shall be selected for weight checks. Each container from samples so selected shall be emptied and the exact gross, tare, and net weight determined. If the containers selected for weight checks have had sample material removed, compensation must be made in calculating weight.

b. Equipment. The maintenance of all sampling equipment in good working condition is essential for accuracy in sampling. The use of worn or battered equipment on bulk ores, for example, affects not only the size of the sample portion but also the distribution of coarse and fine material, with the result that the sample is not representative of the lot. In coning and quartering, the relative distribution of coarse and fines in the cone can be appreciably altered by a turned or unevenly worn edge on the shovel. A bent dividing partition in a riffle changes the relative size of the sample discharges. In addition, all sampling equipment must be carefully cleaned both before and after use in order to avoid contaminating the sample with dust and dirt or with particles of the material on which the equipment was last used.

8. Representative sample. The method for obtaining a representative sample varies according to the physical characteristics of the commodity; i.e., whether the material is liquid or solid, free flowing or viscous, homogeneous or heterogeneous, and according to other factors dealt with in Paragraph 10, below. Specifications included either by incorporation or reference in contracts or purchase orders are sometimes specific in regard to the methods of inspection, sampling, and testing to be used and to the size of the sample to be taken. Whenever this is the case, these contract requirements must be observed by the Inspector.

a. Random Samples. Samples must be taken from locations scattered throughout the lot, or at points uniformly distributed throughout the lot. A random sample is a sample drawn in such manner that each item or portion in the lot has the same chance of being the first item in

the sample, regardless of its position, quality, or appearance; after the sample is drawn, each of the remaining items in the lot should have the same chance of being the second item in the sample. This procedure should be followed until the total sample is taken. The Inspector should use a random sampling table for this type sampling.

b. Composite Sample. When the material being sampled varies appreciably in size and composition, it is important for the Inspector to see that the individual sample portions are representative of those parts of the material from which they were drawn, rather than to try to make each portion representative of the entire lot. The composite of all the portions will then be properly representative of the entire lot.

c. Biased sampling. Inspectors should avoid biased sampling procedures, such as preference for easily accessible units or following routine selection patterns which are easily recognized and involve frequent choice of units in the same sequence. Examples of these are taking items from the same position in containers, stacks, or piles in every inspection, taking items from the top of a container, not taking items from the top of a container, or taking items from the output of certain identical production elements and not from others.

9. Care of samples. During the whole process of sampling, from the time the gross sample is taken until the laboratory sample is packed and sealed in a container for shipment, the sample must not be subjected to any conditions which could alter the quality or composition of the material, or allowed to be contaminated with foreign matter from any outside source. Samples not adequately protected and exposed to any condition which may affect a volatile or vital property of the material are no longer representative of the shipment or lot from which the samples were drawn.

10. Validity of samples. The Inspector must be in a position to vouch for the validity of a sample from the time of sampling until delivery to the analyst. The laboratory samples shall be placed in proper containers immediately after completion of sampling. These containers shall be sealed so that tampering can be detected, and delivery initiated at once. Such practices as leaving the samples in the custody of the producer or having the contractor or producer mail the samples are absolutely forbidden.

11. Factors affecting the sampling method and sample size. The factors that affect the method used in sampling a shipment of any particular commodity and the size of the sample to be taken may include any or all of the

following:

a. Physical Characteristics of the Material. The difficulty in securing a representative sample and the sample size increases as the character of the commodity advances from free-flowing to a viscous liquid, a semi-solid, and a solid.

b. Bulk or Packaged Material. Bulk shipment is used for large lots of moderately coarse material and some liquids of relatively low value. Sampling can best be accomplished by mechanical means while the material is moving into or from the carrier's conveyance. As the value of the material and the fineness of particle size increases, material must be packaged to prevent loss or contamination during shipment and handling.

c. Size of Lot Delivered. It is customary to establish a normal size sample for the normal size lot delivered and then, other factors being equal, vary the sample size from the normal when the size of the lot inspected varies from the normal.

d. Accuracy of Analytical Methods. A sample should represent the original material to within the same degree of accuracy as can be obtained from the analytical methods used in evaluating the sample.

e. Use of Samples. The method of taking the sample, the amount of sample required, and the treatment of the sample to some extent varies with the character of tests to be performed or the use which will be made of the sample.

f. Contractor Performance Record. The size of the sample taken may be determined to some extent by the record of the contractor on previous deliveries.

g. Conditions Under Which Sampling Must Be Done. A poor location with insufficient room for proper handling, unfavorable weather in an outside location, a shortage of labor for handling, or the lack of a particular type sampling equipment may prevent the use of the most desirable sampling procedure. Other important factors are whether the material must be sampled in a stockpile, a ship's hold (it is impossible to obtain a representative sample in either of these locations), or whether sampling can be done while loading or unloading, or from a railroad car.

12. Transmission of samples. The following procedures shall be followed in the identification and transmission of samples under PMDS programs when samples are required to be sent to a laboratory for analyses or tests:

a. Identification of Samples. Each sample forwarded to a laboratory for test and/or analysis or held by the Government for umpire purpose shall bear a GSA Form 337, Sample Identification Label (figure 4-12.1), completely filled in. The items to be completed are self-explanatory.

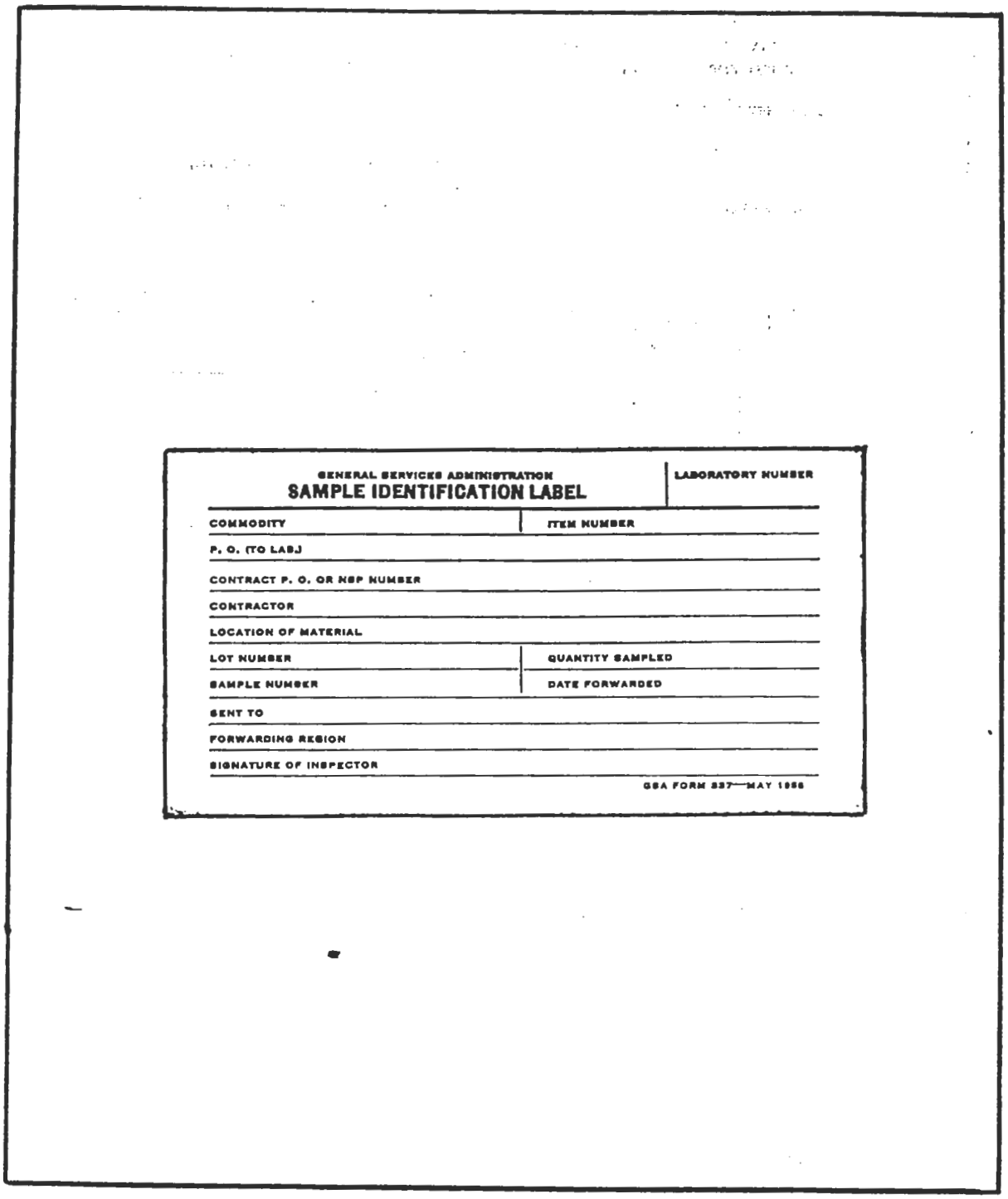
b. Distribution of Samples. Three identical portions shall be drawn from the laboratory sample representing a shipment or lot, and shall be distributed as follows:

(1) One shall be sent to the prime contractor, or his designee, who, in accordance with contract terms or at his own discretion, may have tests and analyses performed.

(2) One, hereinafter referred to as the "Government's laboratory sample," shall be sent to the laboratory specified by the regional Inspection Branch for analyses and/or tests. When the analyses cannot be made by laboratories within the region making the inspection or by use of an existing service contract between PMDS and a commercial laboratory, the Government's laboratory sample shall be held by the regional office and instructions requested from the Central office immediately.

(3) One, called the "umpire sample," shall be held in reserve, in case an umpire analysis is required.

c. GSA Form 1269, Record of Samples Transmitted and Request for Analyses. GSA Form 1269, Record of Samples Transmitted and Request for Analyses (figure 4-12.2), shall be used when forwarding samples for tests and/or analyses to commercial or Government laboratories. The distribution of the form, analysis certificates, and invoice is printed thereon.



GENERAL SERVICES ADMINISTRATION
SAMPLE IDENTIFICATION LABEL

LABORATORY NUMBER

COMMODITY	ITEM NUMBER
P. O. (TO LAB)	
CONTRACT P. O. OR NSP NUMBER	
CONTRACTOR	
LOCATION OF MATERIAL	
LOT NUMBER	QUANTITY SAMPLED
SAMPLE NUMBER	DATE FORWARDED
SENT TO	
FORWARDING REGION	
SIGNATURE OF INSPECTOR	

GSA FORM 337—MAY 1956

Figure 4-12.1. GSA Form 337, Sample Identification Label

Item 15. Check the applicable box to indicate tests described.

Item 16. Check the applicable box to indicate the nature of the document under which tests will be performed.

Item 17. Check the applicable box.

Item 18. Check the applicable box or boxes.

Item 19. Enter the location where the material was sampled.

Item 20. Enter the date the sample was taken (the start and final dates, if more than one).

Item 21. Indicate the disposition to be made of the remainder of the sample(s) after the analysis.

Item 22. For comment, if any.

Figure 4-12.2. GSA Form 1269, Record of Samples Transmitted and Request for Analyses (Part 3 of 3)

PART 3. SAMPLING METHODS

13. Scope.

a. This part prescribes sampling methods to be followed by Inspectors and by contractors performing services for PMDS.

b. The methods outlined are based upon recognized and accepted industrial practices and should be applied as standards in the sampling of commodities listed herein. These methods are general in scope, since they must be adaptable to varying conditions encountered in sampling operations. Minor modification of the methods and procedures may be effected as deemed appropriate and necessary by the Chief, Inspection Branch, of the region concerned.

14. Sampling Method No. 1. This method is especially applicable to free flowing powders, granules, small crystals, and other finely divided materials which tend to segregate or stratify by gravity into layers of different compositions, and covers material received in boxes, bags, barrels, drums, and other containers too large to be sent to the laboratory.

a. Apparatus. The apparatus, called a sample trier or thief, to be used on materials in this category consists essentially of two slotted tubes, one of which fits within the other. It can be taken apart readily and cleaned by merely brushing. The original Minnesota State grain trier or the Grain Sampler recommended by the Association of Official Agricultural Chemists, which is shown in the Fisher Scientific Catalogue, can be used, and the apparatus designed by and made for United States Customs Laboratory at New York, a drawing of which appears on Page 150 of the U. S. Treasury Department, Bureau of Customs "Sampling Guide," published by GPO, is also recommended.

b. Gross Sample.

(1) For commodities received in containers other than bags, ten percent of the containers in any shipment or inspection lot shall be opened for inspection and sampling. The percentage of containers sampled may be increased if, in the opinion of the Inspector, the character of the material is such as to warrant additional sampling.

(2) For commodities received in bags, the rate of sampling should be as follows:

(a) For lots containing ten tons net or less, a sample shall be taken from ten percent of the bags, or from twenty bags, whichever is the greater number.

(b) For lots ranging in size from ten tons to one hundred tons, samples shall be taken from twenty bags, plus one additional bag for each additional ton of material in excess of ten tons.

(c) For lots exceeding one hundred tons net, samples shall be drawn from one hundred containers, plus one additional container for each additional two tons of material in excess of the first one hundred tons.

(d) The sampling procedure described in (a), (b), and (c), above, applies to material in bags having a net content of approximately one hundred pounds or less. For greater net weights, the number of containers sampled may be reduced in proportion to the percentage of increase in weight over one hundred pounds net per container. Containers to be sampled should be selected at random and, as nearly as possible, from different parts of the lot. The actual sampling operations will differ according to containers and conditions under which sampling is accomplished, but a cross section of the material sampled must be obtained from top to bottom of the containers, to eliminate poor representation due to settling or stratification of mixtures or powders of different degrees of fineness or specific gravity. Therefore, the special trier described under Paragraph 14.a., above, should be inserted from either end of the container through to the opposite end and, if possible, diagonally.

(3) The accumulated samples from 10 percent of bags or other containers in a 1,000-unit lot will amount to about 20 pounds. The total sample taken from one lot shall be thoroughly mixed and then riffled down through an approved riffler to such an amount as will provide the required number of samples, each of which should have a minimum weight not less than the amount shown for the commodity in Column 3 of the Table, Part 4, below.

c. Laboratory Sample. Normally, the number of samples required is three, one for the seller, and two for the Government, one of which is called the Umpire. If the vendor desires more than one sample, it should be prepared along with the others. After riffling the composite sample down to minimum requirement for the final samples, the material is again thoroughly mixed and, placed on a large sheet of heavy wrapping paper or oilcloth, spread out in a layer about one inch thick on

the mixing surface by coning and flattening, and then divided into the required number of portions. Disposition of samples collected from each lot shall be as directed in Paragraph 12, above.

15. Sampling Method No. 2. This method of sampling is applicable to solids of known uniform chemical composition, such as agar, quebracho, shellac, or similar loose solids in the form of lumps, flakes, crystals, cubes, sheets, powder, etc., of uniform chemical composition and contained in ships' holds, railroad cars, bags, drums, barrels, boxes, or other containers.

a. Apparatus. A trier or thief (so-called butter trier) may be used, 14 inches over-all length with a half-cylinder stainless steel blade, approximately 13 inches long with greatest diameter 11/16 inch near the handle and tapering uniformly to 9/16 inch diameter at the rounded, sharp digging end. This trier is used in the case of material in barrels, by first boring 1-inch holes through top or side of the barrel, then inserting the trier, removing a portion for sample, and then closing the hole in the barrel with a cork stopper or wooden plug. The trier may also be thrust through the walls of a jute or cloth bag, a portion of the contents removed, and the hole closed by sewing. Shovels, spoons, and hands may be used, where applicable. Hammers may be necessary to reduce lumps and, in conjunction with chisels, to chip or break solid masses. Jones' samplers will be found convenient in the operation of reducing the gross samples to laboratory size.

b. Gross Sample. This method requires judgment (based on the character of the materials being sampled). Lumps should be selected to truly represent the material. It is most important to secure a proper ratio between the larger pieces and the finer powder, which is practically always present. Uniformly fine materials present much less difficulty in sampling, but, due to various causes, the condition of the outside and surface portions of the materials may differ more or less from that of the interior. It is therefore always advisable to use a trier. In all cases, the sampler is to satisfy himself that the sample is typical of the materials and not merely typical of a portion. If individual containers of the same invoiced material appear to differ in any way, samples of the differing materials should be sent to the laboratory also. Material packed in barrels should be sampled by removing the heads and taking three trier samples, one near the center, and one radially on each side of the center halfway between the center and side, or holes may be bored through the sides of the barrels, the trier portion removed and the holes closed with cork stoppers or wooden plugs. Bags should be pierced with the 14-inch

trier, each bag in places equally distant from each other, portions removed, and the holes sewed up. The hole which the trier makes in the cloth bag can be closed by knitting with a sharp pointed instrument. Ten percent of barrels, bags, and similar containers in each lot should be sampled. The gross samples should be equal in weight to 1/10 percent of the lot, but never less than ten pounds.

c. Laboratory Sample. The gross sample, which should be collected in bags or buckets, is transferred to a smooth surface, preferably steel, and the lumps or other large pieces broken up. After crushing, mixing, coning, and quartering, the sample is placed on a clean cloth or paper and rolled. The rolled material is spread out with a spatula and small amounts selected from points all over the spread material so that the final sample will be representative. If the spread material is fine, the portion for the laboratory sample may be selected by means of an approved riffler. Disposition of samples collected from each lot shall be as directed in Paragraph 12, above.

16. Sampling Method No. 3. This method covers hand sampling of heterogeneous solids in various forms. It is recommended only where no sampling machinery is available. Each problem must be worked out by the sampler, bearing in mind the particular conditions occurring at the place of sampling. The methods will, of necessity, vary, depending upon the type of material, such as coarse, fine, or mixtures of both, as well as the containers.

a. Apparatus. Short and long-handled shovels, coal forks, with suitable rounded point and others with square digging edges, wheelbarrows, light and heavy hammers and mauls, gross sample buckets and bags, spatulas, triers as described in Method 2, pipe samplers, 6 to 8 feet long, 2 inches in diameter, having a narrow slot lengthwise starting a foot or more from handle end and ending within a few inches of the opposite, sharpened, circular end. Whenever it is possible to obtain or use crushers and grinders, Sturtevant, Braun, and Allis-Chalmers are recommended. If power crushers and grinders are available, even at some distance, it is advisable to transport the gross samples to them.

b. Gross Sample.

(1) Mechanical sampling, the most efficient and economical method, should be used whenever possible. This process produces approximately 3.2 pounds of sample for each net ton of original solids. The sample so produced is in a state of fineness to pass through an eight-mesh

screen. The amount of sample at this stage from a 100-ton lot of solids would be 320 pounds. This is mixed, coned, and quartered to 50 pounds (the gross sample).

(2) Hand sampling of coarse and fine solids loaded in bulk into railroad cars is to be accomplished by taking samples from 12 spots in the material in each car. One in each corner of the car near the bottom of the pile, and one in each corner near the top, and 4 of the material in the center of the car, with 2 of the latter being near the top and 2 near the bottom of the pile. A total of from 50 to 100 pounds of material is to be obtained from each car. When material is sampled in trucks, a similar procedure shall be followed, with a proportionate number of spots selected and quantity taken. These samples can be taken with shovel, or, if the material is fine or soft, with pipes driven into the material. The sample portions from all of the cars or truck loads of material comprising the lot are to be crushed with a crusher, or broken by hammers and mauls, if no crusher is available, so that no lumps exceed two inches in size. Then, the quantity is reduced to about five tons for each lot of material, by mixing, coning, and quartering. When a power crusher is not employed, a hard, clean surface, free from cracks and protected from rain, snow, wind, and beating sun, shall be used for breaking up the lumps. Cinders, sand, and chips, or other contaminating material must be avoided. This additional crushing of large lumps may be done with hammers or mauls. The 5-ton portion can be reduced in stages to about 1/4-inch size, which material shall be quartered or riffled to about 100 pounds. Materials in barrels, bags, or similar containers shall be sampled by removing about 5 pounds from below the surface in every tenth container, with a shovel, trier, or pipe, care being taken to see that the 5-pound sample is representative of the entire contents of the container. If this method is not practicable, every tenth container should be dumped on a clean, hard surface, and by means of shoveling, coning, and quartering, and reduced to approximately 5 to 10 pounds in weight. The gross sample thus consists of a combination of these portions. It may be necessary to reduce the size of the particles, the procedure for which is outlined above. In cases of sampling, where the routine described here cannot be carried out, representative pieces should be sent to the laboratory as a sample. If solids are being transported by a belt conveyor, the belt could be stopped every hour and all of the material lying between two idlers taken. The belt should be swept clean of material at this place. If equipment exists for cutting the stream as it passes over the end of the belt, sample portions of the material, in the amount of at least two pounds for each one ton of material, could be taken at regular intervals. Whenever possible, bulk shipments should be sampled while being unloaded from

or loaded into the carrying vehicle, because samples taken in this manner are generally more representative than those taken from loaded material in a car or truck.

c. Laboratory Sample. The gross sample of about 100 pounds should be further crushed and be reduced in steps so that about 5 pounds of material passing a 16 or 20-mesh screen results. This five pounds should be ground to pass a 100-mesh or finer screen, be mixed well, and divided by riffling into the required number of sample packages for the chemical analysis. If the sampler is able to prepare the 100-pound sample from the gross sample, but is unable to proceed further due to lack of apparatus, the 100-pound sample should be sent to the laboratory. Disposition of samples collected from each lot shall be as directed in Paragraph 12, above.

17. Sampling Method No. 4. This method of securing samples for laboratory analysis covers metals, solders, and other similar materials received in the form of ingots, pigs, slabs, rondelles, bars, castings, and scrap.

a. Apparatus. Apparatus shall consist of power drill presses using drills of varying diameter, usually 5/16 inch, and power metal saws or miller; and a Jones' or more modern approved sample riffle which divides a sample into two parts by one passing of the material, each part representative of the original material.

b. Gross Sample.

(1) The gross sample shall be taken preferably during plant production at the time of final forming or casting, and concurrently with manufacturer's sampling. If this is not possible, then sampling may be done either by sawing, drilling, or milling a representative group of castings or sample specimens, and shall represent the average cross section of the commodity.

(2) In the sampling of castings or sample specimens, select samples at random from the lot. Considering three ingots as a rectangular unit, drill three holes entirely through unit, one at the center and one at each end on a diagonal of the rectangle, starting from the bottom. Use no lubricant on the drill, and if the sample shows oil or grease, remove this with ether. Start the drill on the surface sufficiently to remove all oxide and clean surface before commencing to take the sample. Control the drill speed so as to prevent over-heating and oxidation of the

chips. Collect the drillings for the sample. Discard all drillings carrying oxide from the "set" or burned by the drill. Keep drillings in an airtight bottle.

(3) The receiving laboratory will be directed to sift all sample drillings submitted on a screen with 250 meshes per square cm., in order to remove material which is ground between the drill and sides of the hole, and also to extract with a strong magnet any iron which may come from the drill. For certain metals, gross samples shall be obtained by the following special procedures:

(a) Nickel - From five percent (5%) of the electrolytic cathodes of a lot up to a maximum lot size of 50 LT, using template prescribed by ASTM-B39.

(b) Tin - From ten percent (10%) of the pigs of a melt or lot up to a maximum lot size of 50 LT.

(4) Pigs and bars of antimony, bismuth, and cadmium may be sampled by selecting at random three pigs or bars from each lot. The gross sample will be obtained by sawing through the sample in sufficient places to obtain representative sawdust for the required laboratory samples. Saw cuts shall be made approximately 5/8 inch deep on samples 1-1/4" or more wide, and must be so spaced that metal from the entire sample is adequately represented. Saw cuts approximately 5/8" deep should be made on sample 1-1/4" wide by 8-1/2" long as follows: One longitudinal cut on each and approximately 5/8 inch from the edge on a bar 1-1/4" wide. Transverse cuts should be spaced with marks on one side at 2-1/4", 4-1/4", and 6-1/4" from one end, while the opposite side should be spaced with marks at 1-1/4", 3-1/4", 5-1/4", and 7-1/4" in order that the transverse sawing will not segregate the sample bar into more than one piece. No lubricants shall be used for sawing. The sawings shall be carefully treated with a magnet at the laboratory to remove any particles of steel introduced in taking the sample.

c. Laboratory Sample. Gross samples of drillings and milling shall be reduced by approved methods for the laboratory sample. Disposition of samples collected from each lot shall be as directed in Paragraph 12, above. Cobalt in the form of rondelles shall be sampled by selecting representative portions from ten percent of containers in each lot in the same manner as the gross sample described in Paragraph 15, above. The sample is prepared from the gross by collection in bags or buckets. The accumulated samples from ten percent of containers in a 1,000-unit

lot will amount to approximately 100 pounds. The total or gross sample taken from one lot shall be thoroughly mixed and then riffled down through an approved riffler to such an amount as will provide the required number of samples. Sample cobalt rondelles obtained shall be sent to the laboratory without further processing.

18. Sampling Method No. 5. This method is applicable for sampling of lubricants, fuels, and other commodities in liquid form contained in drums, barrels, cans, tank cars, and storage tanks. Commodities which may be sampled by this method are liquid petroleum products, castor, palm, and sperm oils, and mercury.

a. Apparatus. Apparatus shall consist of metal thiefs, as described in ASTM Standards D-270-65, and a gross sample container (a clean metal or enameled can or glass jar of suitable capacity). Thiefs, gross sample containers, and the sample bottle used in sampling these liquids should be cleaned with a solvent, such as naptha, washed with warm water and soap, and thoroughly dried before use. If corrosive liquids like acids are to be sampled, the above instruments should be cleaned with soap and warm water and dried before and after use.

b. Gross Sample.

(1) Where standard or tentative standard methods for sampling by ASTM or other recognized specifications are required by the contract, they shall be followed in detail, in addition to the more general requirements appearing in these methods, and shall supersede them if there is conflict.

(2) Unless otherwise directed, one out of every ten drums shall be sampled. However, if shipment consists of less than ten drums, each drum shall be sampled.

(3) Prior to removing the bung, the drum should be rolled, if possible, to thoroughly mix its contents; if impractical to roll, the contents should be well mixed by stirring by means of a rod, after removing the bung. The rod should be of a length to reach the opposite side of the drum. If available, a high-speed bung entering electric-driven, propeller-type mixer should be used.

(4) After contents of drum have been thoroughly mixed, slowly insert appropriate thief until its end touches opposite side of the drum. Close thief and withdraw transferring contents to gross sample container;

repeat operation until at least a twelve-ounce sample has been obtained.

(5) Care must be exercised to insure the uniform dispersal of solid matter and sediment, if any, that may have collected in the bottom of the drum. Contents must be homogeneous when the sample is withdrawn. During cold weather, certain types of liquids, such as anise oil, sperm oil, and others, may solidify; and when this occurs, the drums should be removed to a warm place to allow contents to liquefy. Then, after thorough mixing, the sample should be taken as above.

c. Laboratory Sample. The one or more samples in the gross sample container are well mixed by shaking or stirring; depending upon the character of the sample, it may be poured or transferred by a thief to a bottle for laboratory test. Disposition of samples from each lot shall be as directed in Paragraph 12, above.

19. Sampling Method No. 6. This method is applicable to semi-liquids, viscous liquids of syrupy consistency in ships, tanks, tank cars, barrels, and other containers.

a. Apparatus.

(1) A bucket, approximately two-gallon capacity, made of heavy galvanized iron, and equipped with an attached, close-fitting lid, should be used for gross samples. If such a bucket is not available, other types may be used, but it must have a close-fitting lid. For barrels and similar containers, use a strong stick, 40 inches long, 1-1/2 inches wide, and 1-1/8 inches thick at the handle. This is known as a stick sampler. For syrups in tank cars, a beaker may be used, as described under b, below.

(2) The utmost care should be taken to keep all the sampling apparatus clean and dry when not in use. The sampler should supply himself with suitable cleaning and polishing material. The stick should be scraped occasionally, and a suitable scraper should be on hand.

b. Gross Sample.

(1) Merchandise in ship's tanks and tank cars is sampled by taking one-pint (1/2 liter) samples from a spigot in the discharge line at regular intervals, depending upon the rate of discharge, so that each one-pint (1/2 liter) portion represents a like volume. These portions are poured into the gross sample bucket (one bucket of samples for each 5,000

gallons discharged).

(2) For merchandise in barrels and similar containers, at least 10% if the containers in a lot should be sampled. The contents of each receptacle to be sampled should be stirred with the stick sampler; and when uniform, the stick is withdrawn and the clinging syrup is deposited in the sample bucket by drawing the stick across an edge.

(3) Syrups in tank cars may be sampled by a device consisting of a 1-liter cylindrical brass beaker or bottle equipped with two chains, one attached to the beaker, and the other to the lid of the beaker. This brass beaker is lowered, first to one-third the depth of the tank, the lid raised while the beaker fills, then closed, and the beaker withdrawn. The operation is repeated at one-half and two-thirds depth of the tank. The three portions are emptied into the gross sample bucket and mixed.

c. Laboratory Sample.

(1) The gross sample is mixed in the buckets by use of the stick sampler or a shorter one. When the stick is withdrawn, the clinging liquid is deposited in the laboratory sample container.

(2) It is necessary that the sampler secure a truly representative sample from each lot of a shipment. Samples should be kept in air-tight containers, to prevent drying out or absorption of moisture, and should not be contaminated. Disposition of samples collected from each lot shall be as directed in Paragraph 12, above.

20. Sampling Method No. 7. When commodities in this category cannot properly or conveniently be melted and sampled as liquids (Sampling Method No. 5), sampling may be accomplished by boring. This method is applicable to soft-solid and semi-solid materials, such as asphalts, waxes, greases, and palm oil, in cases, boxes, bags, or tanks.

a. Apparatus. The ship auger for boring shall be 3/4 inch diameter and shall conform to the form and dimensions in Federal Standard Stock Catalog, and be of such a length as to pass entirely through the material to be sampled.

b. Gross Sample.

(1) Ten percent of the containers shall be opened as follows: Cases and barrels shall have the covers or heads removed; bags shall

have the mouths opened; cakes shall have the wrappings, if any, opened.

(2) If foreign substances, such as dirt, sticks, string, etc., appear upon the surface, they shall be removed. Foreign matter found in the interior shall be included.

(3) Three test holes shall be bored through the body of the material of each sample container as follows: one at the center, one at one-quarter of the diameter (or width of the package) from the right side, and one one-quarter of the diameter (or width of the package) from the left side. Each boring shall be kept separate and sent to the laboratory as a separate sample.

c. Laboratory Sample.

(1) The gross sample by this method constitutes the sample for laboratory analysis.

(2) If no visible differences appear in the borings, they may be combined, preserved, examined, and tested as a single sample. If subdivision of the borings is desired, they may be chilled, pulverized, if necessary, for handling, sized, and quartered until reduced to the amount desired, after receipt in the laboratory. Disposition of samples collected from each lot shall be as directed in Paragraph 12, above.

PART 4. TABLE OF NATIONAL STOCKPILE COMMODITIES AND SAMPLING METHODS

21. General. This part prescribes sampling methods explained in Part 3, above, which are generally applicable for the various commodities inspected by GSA, for the national stockpile. Different conditions will make it impossible to follow exactly the methods prescribed in these procedures; however, they will serve as guides to Inspectors and samplers in the many conditions to which they do apply and will provide the basis for developing variations whenever necessary.

22. Table of Commodities and Sampling Methods.

Method of Sampling		Commodity	Minimum Amount of Laboratory Sample	Acceptable Containers
2		Agar	8 oz.	B-A
4		Aluminum	4 oz.	A-C-D
4		Antimony	4 oz.	A-C-D
3		Bauxite	8 oz.	A-C-D
3		Beryl	16 oz.	A-C-D
4		Bismuth	10 oz.	A-C-D
4		Cadmium	10 oz.	A-C-D
5	/	Castor Oil	1 qt.	B
3		Celestite	8 oz.	A-C-D
3		Chromite	4 oz.	A-C-D
4		Cobalt	4 oz.	A-C-D
5		Coconut Oil	1 qt.	B
3		Columbite	4 oz.	A-C-D
4		Copper		
		Fire Refined Casting, ASTM-B72	2 lbs.	A-C-D
		Fire Refined, ASTM-B216	1 lb.	A-C-D
		Brasses	1 lb.	A-C-D
		Other Grades	4 oz.	A-C-D
3		Corundum	10 lbs.	A-C-D
2	*	Emetine	0.1 oz.	A
1		Fertilizer	8 oz.	A-C-D
3		Fluorspar	8 oz.	A-C-D
3		Graphite		
		Crucible Grade	2 lbs.	A-C-D
		Lubricant Grade	1 lb.	A-C-D
		Amorphous Lump	8 oz.	A-C-D

Method of Sampling		Commodity	Minimum Amount of Laboratory Sample	Acceptable Containers
2	*	Hyoscine	0.1 oz.	A
2		Iodine	4 oz.	A
3		Kyanite	5 lbs.	A-C-D
4		Lead		
		Corroding	16 oz.	A-C-D
		Others	4 oz.	A-C-D
4		Magnesium	16 oz.	A-C-D
3		Manganese Ore	4 oz.	A-C-D
5		Mercury	8 oz.	A-C-D
3		Molybdenum	4 oz.	A-C-D
1		Monazite	8 oz.	A-C-D
4		Nickel	4 oz.	A-C-D
5		Palm Oil	1 qt.	B
1		Pepper	8 oz.	A-B-C-D-E
5		Pyrethrum Extract	8 oz.	B
2		Quebracho	8 oz.	A-B-C-D-E
2		Quinidine	1/2 oz.	A
2		Quinine	1/2 oz.	A
1		Rutile	8 oz.	A-C-D
2		Shellac	8 oz.	A-B
5		Sperm Oil	1 qt.	B
3		Tantalite	4 oz.	A-C-D
4		Tin	8 oz.	A-C-D
3 or 4		Tungsten	4 oz.	A-C-D
3		Vanadium	6 oz.	A-C-D
4		Zinc		
		Special High Grade	32 oz.	A-C-D
		Other Grades	16 oz.	A-C-D
3		Zirconium Ores	4 oz.	A-C-D

/ Federal Specification JJJ-9-318.

* No umpire sample required (very poisonous).

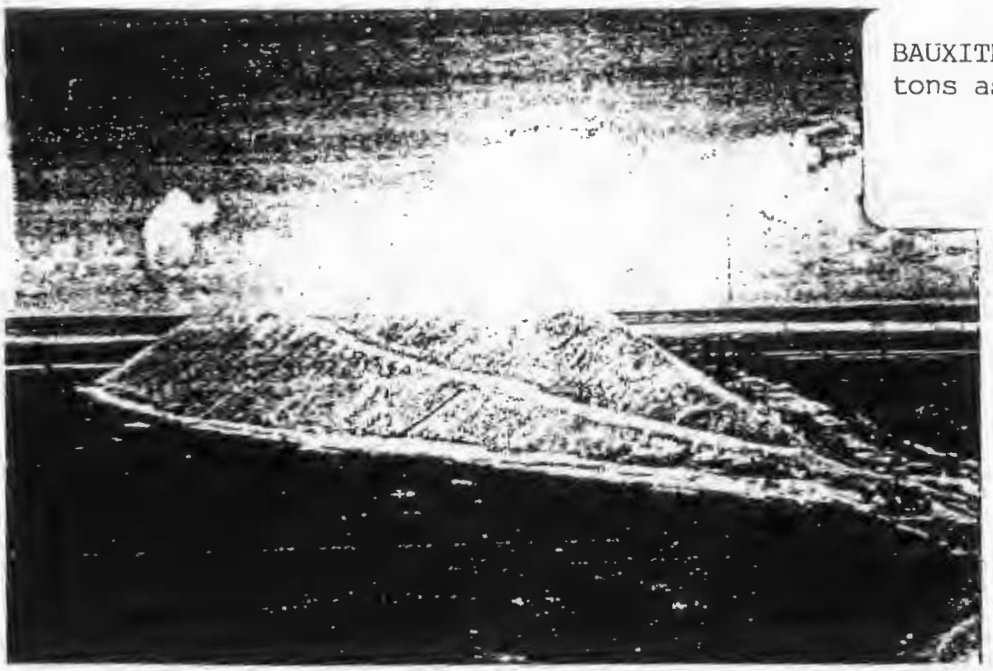
23. Explanation of Table.

a. First Column. The first column refers to the suitable sampling procedure for each listed commodity, which is determined primarily by the physical character. The methods of sampling are described in

APPENDIX 8 - PHOTOGRAPHS

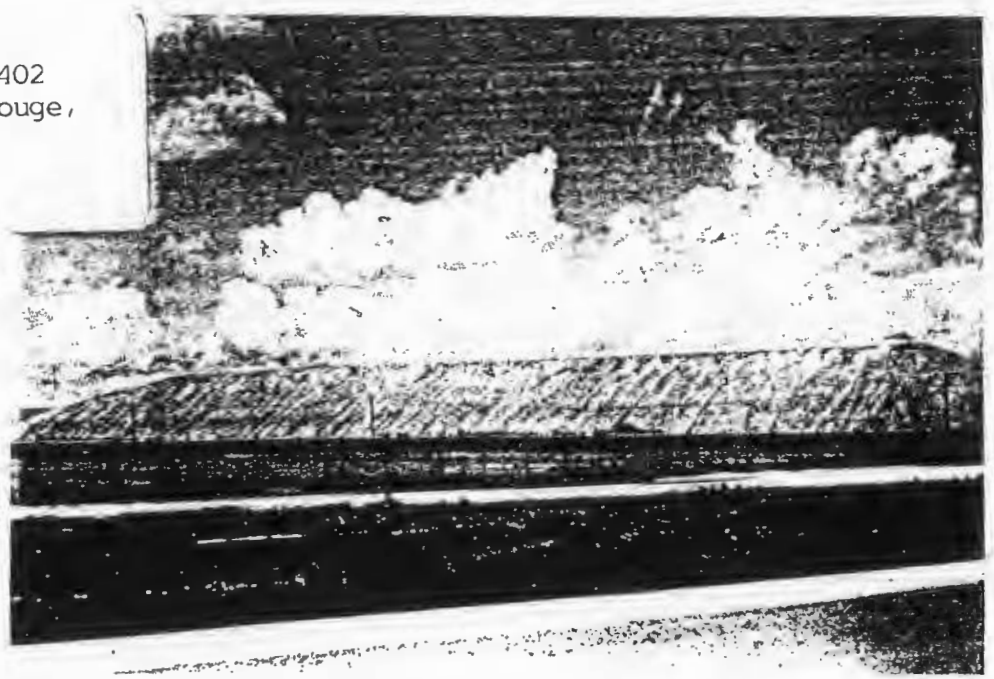
FERRO MANGANESE - as stored

in the stockpile, West Virginia
Note: Average size of alloy



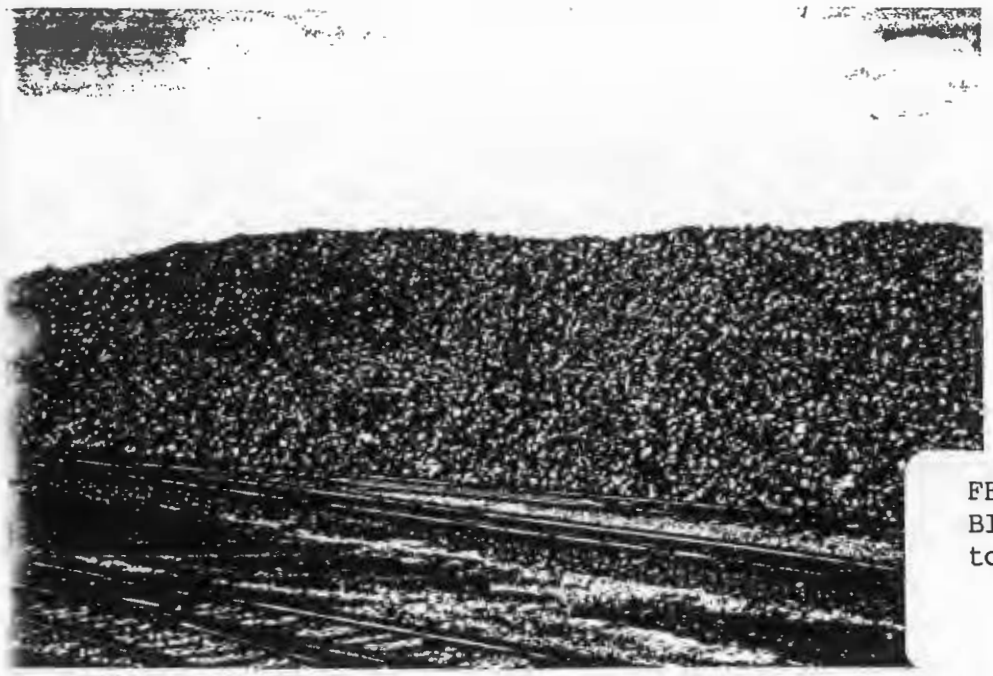
BAUXITE, METALLURGICAL - 300,721 short tons as stored in Port Comfort, Texas

BAUXITE, METALLURGICAL - 1,586,402 short tons as stored in Baton Rouge, Louisiana



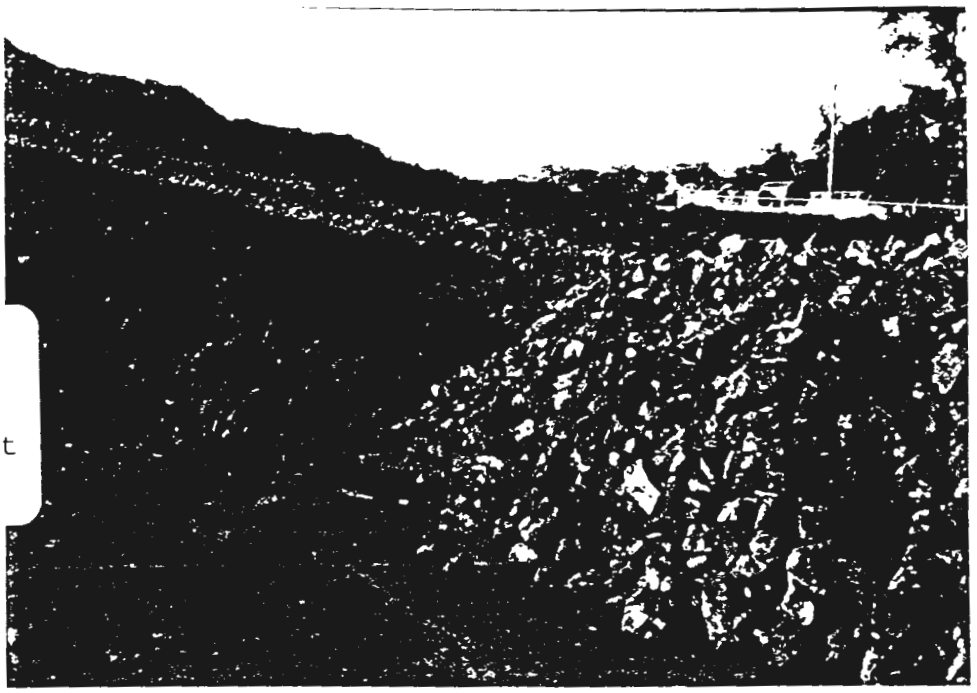
ANOTHER ANGLE AT THIS
PLATEAU OF JAMAICAN BAUXITE IN
CORPUS CHRISTI, TEXAS OVER
8 MILLION TONS

BAUXITE, METALLURGICAL from Jamaica
red in color and very fine requiring
hydro seeding and irrigation to secure
material in storage



FERRO MANGANESE AS STORED IN BIRMINGHAM, ALABAMA - 14,162 short tons near railroad siding.

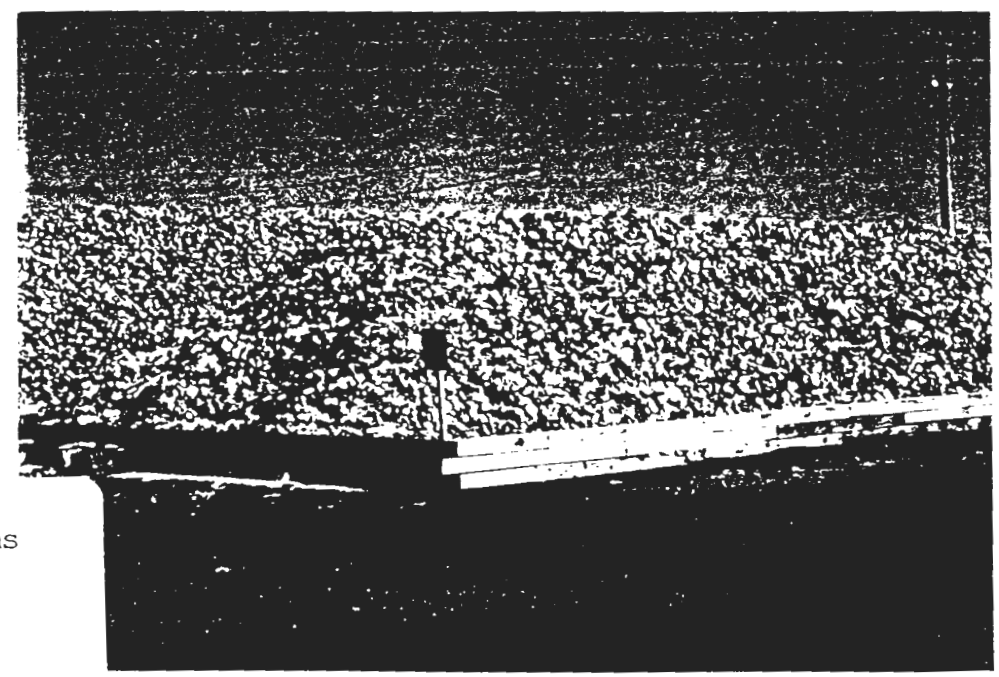
FERRO MANGANESE, BAUXITE, MANGANESE AND BERYL ORE STORED IN MARIETTA, PENNSYLVANIA



'RRO MANGANESE - stored in
st Virginia. Material is
ored on reinforced concrete
d. quantity over 300,000 short
ns

BERYL ORE - stored in Ohio
directly on the soil. Vegetation
secures material from erosion.

FLUORSPAR (acid grade) - stored in 8-10 trenches covered with impermeable polyvinyl chloride covers secured by wire cable
COLORADO



FERRO CHROMIUM - 33,693 short tons as stored in Hammond, Indiana

Attachment 4

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
REGION 8
6274 EAST AVON-LIMA ROAD
AVON, NEW YORK 14414
716/226-2466
716/226-9485 (FAX)

Regional Direction **Legal Division** **Administration**

FAX TRANSMISSION

TO: Bob Mutaw

FROM: Vonnie Gerace

DATE: 10/9 NO. OF PAGES (includes cover page) 3

MESSAGE: I spoke with Joe Marchitell regarding this spill and he said he spoke with the property owner who told him the problem has been corrected. Joe said the file can be closed.

____ Original being mailed X Original not being mailed

NYSDEC SPILL REPORT FORM

DEC REGION# 8 (Avon) SPILL NUMBER 9410950
SPILL NAME: CLARK (GEORGE) RESIDENCE DEC LEAD: JM
CALLER'S NAME: CHARLIE CARROL NOTIFIER'S NAME:
CALLER'S AGENCY: SENECA COUNTY HEALTH DEPT NOTIFIER'S AGENCY:
CALLER'S PHONE: (315) 539-5331 EXT. NOTIFIER'S PHONE: EXT.

SPILL DATE: 11/15/94 TIME: 16:39
CALL RECEIVED DATE: 11/15/94 TIME: 16:39 RECEIVED BY CID #:

	Material Spilled	Mat. Class	Am't Spilled	Units	Am't Recovered
1)	UNKNOWN PETROLEUM	(Pet)-Haz-Other-Unk.	0	Gal - (Lbs)	0
2)		Pet-Haz-Other-Unk.		Gal - Lbs	
3)		Pet-Haz-Other-Unk.		Gal - Lbs	
4)		Pet-Haz-Other-Unk.		Gal - Lbs	

SPILL LOCATION

PLACE: CLARK (GEORGE) RESIDENCE
STREET: 4910 SECOR ROAD
T/C/V: VARICK CO: SENECA
CONTACT:
PHONE: EXT.

POTENTIAL SPILLER

NAME: GEORGE CLARK
STREET: SAME
CITY:
STATE: ZIP:
CONTACT:
PHONE: (315) 585-6012 EXT.

SPILL CAUSE

Human Error	Tank Test Failure*	(Tank Failure)
Traffic Accident	Housekeeping	Tank Overfill
Equipment Failure	Deliberate	Other
Vandalism	Abandoned Drums	Unknown

SPILL SOURCE

Gas Station	(Private Dwelling)	Non-Maj Facility
Passenger Vehicle	Vessel	Comm/Indust
Comm. Vehicle	Railroad Car	Non-Comm/Instit
Tank Truck	Major Facility	Unknown

RESOURCE AFFECTED

On Land	(Groundwater)	Air
In Sewer	Surface Water**	

**WATERBODY:

SPILL REPORTED BY

Responsible Party	Tank Tester	Local Agency
Affected Persons	DEC	Federal Gov't
Police Department	Citizen	Other
Fire Department	(Health Dept.)	

CALLER REMARKS: ACCORDING TO CALLER, A 275 GAL HEATING OIL TANK ON THE CALLER/RESIDENT'S PROPERTY HAS LEAKED, CONTAMINATED THEIR WELL. ACCORDING TO RESIDENT, WELL HAS BEEN CONTAMINATED FOR QUITE AWHILE.

*PBS Number	Tank Number	Tank Size	Test Method	Leak Rate

PRIMARY CONTACT CALLED DATE: TIME: hrs. REACHED DATE: TIME: hrs.
SECONDARY CONT. CALLED DATE: TIME: hrs. FAXED BY CID#:

PIN #	T & A	Cost Center	ISR to Central Office
Cleanup Ceased	Meets St'ds NO	Last Inspection	Penalty NO
RP-CUI	ENF-INIT	INVES-COM	CAP
UST Trust Eligible NO	Site: A (B) C D E	Resp. Party 1 2 (3) 4 5 0	Reg Close Date
Created on 11/16/94	Last Updated on / /	Is Updated? NO	EDO / DATA INPUT [ ]
Date Printed: 10/08/97			

PrintFor 10/09/97 AAA

Spill Number: 9410950 **Spill Name:** CLARK (GEORGE) RESIDENCE **Printed on:** 10/08/97

DEC REMARKS

11/15/94: TANKS HASN'T BEEN USED FOR OVER 4 YRS. RESIDENT HASN'T BEEN DRINKING THE WATER, BUT IS USING IT TO SHOWER IN. NEED TO FOLLOW-UP DURING THE DAY 12-6 PM.