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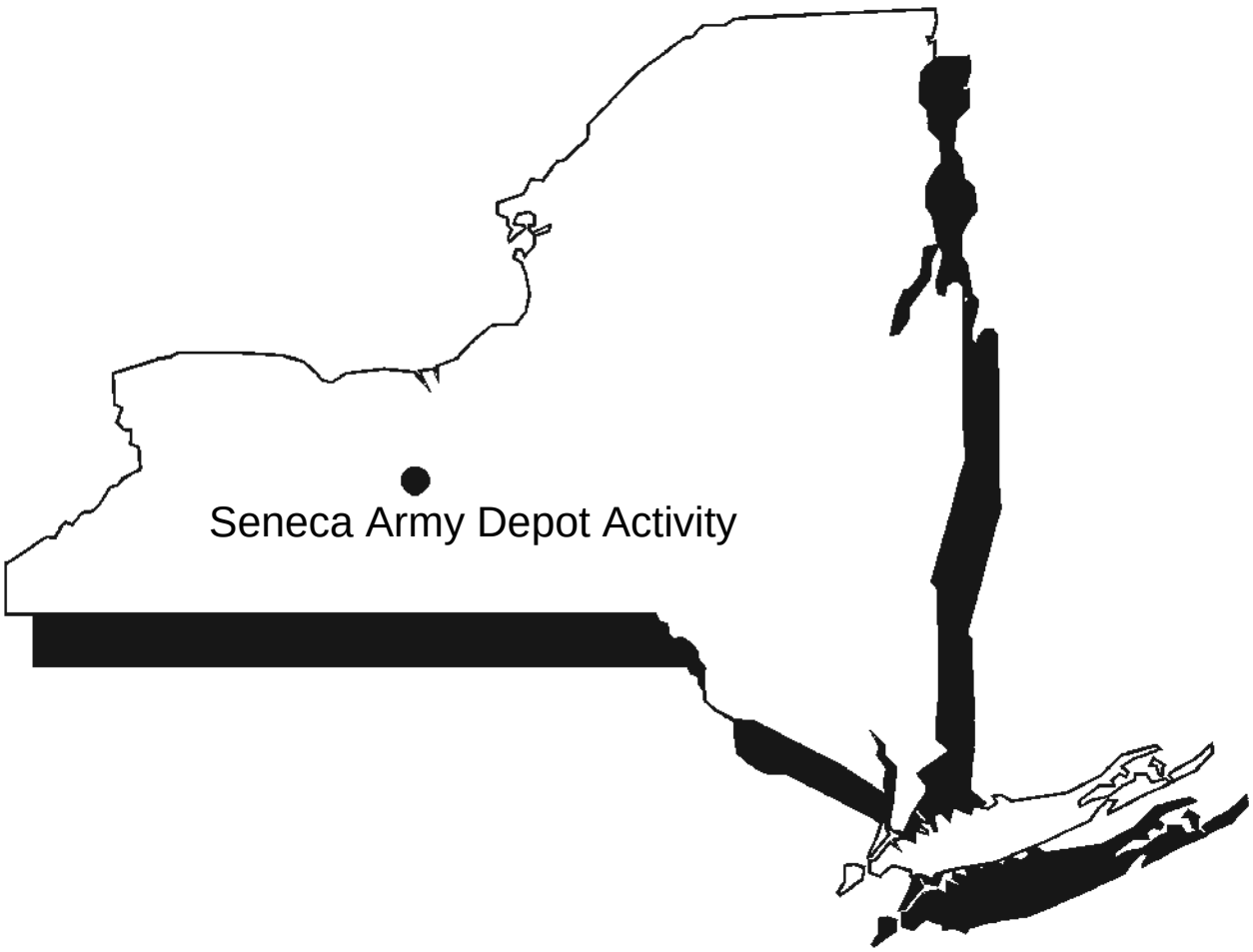


FINAL
SWMU CLASSIFICATION REPORT
SENECA ARMY DEPOT ACTIVITY

VOLUME II OF II

SEPTEMBER 1994

APPENDIX B

APPENDIX B

Summary of Visual Inspection, Seneca Army Depot Activity,
September 10 through 14, 1990

FIELD REPORT

SOLID WASTE MANAGEMENT UNIT CLASSIFICATION STUDY
SENECA ARMY DEPOT, ROMULUS, NEW YORK
TASK AM-1: VISUAL INSPECTION AND RECORDS REVIEW
TASK AM-6: INVESTIGATION OF ADDITIONAL SITES

DATE: September 10 through 14, 1990
BY: Julie Hubbs, P.E. and Dimitra Syriopoulou, Ph.D.

I. MONDAY, SEPTEMBER 10, 1990

A. 8:15 a.m.: Arrived at the Seneca Army Depot (SEAD) Main Gate, Post 1, on NYS Route 96. Passes were obtained for access to the SEAD for September 10, 1990.

B. 8: 50 a.m. - 12:30 p.m.: Meeting, Building 123

Participants:

Gary Kittell, SEAD
Randy Battaglia, SEAD
Walt Perro, USCOE, Huntsville Division
Griff Wyatt, ERCE
Julie Hubbs, ERCE
Dimitra Syriopoulou, ERCE

C. 1:15 p.m. - 2: 00 p.m.: Pictures of the AE representatives, Julie Hubbs and Dimitra Syriopoulou, were taken as part of the SEAD security requirements. Also, passes were obtained for September 11 through 14, 1990.

D. 2:00 p.m. - 2:30 p.m.: Records review, Building 123.

E. 2:30 p.m. - 4:30 p.m.: Visual Site Inspection. Escorted by Randy Battaglia.

1. SEAD-25: Fire Training and Demonstration Pad. (2:45 p.m.)
   - Refer to the U.S. Army Environmental Hygiene Agency's Groundwater Contamination Survey No. 38-26-0868-88 for background information (AEHA report).

2. SEAD-6: Abandoned Ash Landfill (3:20 p.m.)
   - RI/FS work has been initiated.
   - Groundwater monitoring data is available.
   - Debris has been observed north of the ash landfill. Several piles of debris (i.e., crushed heavy gauge metal drums, empty smoke generating canisters or "smokepots"; various other metallic debris) were found during a field investigation (1989). Location: South of Cemetery Road, east of plowed field.
   - Refer to the AEHA report for background information.

3. SEAD-15: Building 2207-Abandoned Solid Waste Incinerator - (3:30 p.m.)
   - RI/FS work has been initiated.
   - Refer to the AEHA report for background information.

4. SEAD-8: Non-Combustible Fill Area (3:35 p.m.)
   - RI/FS work has been initiated.

5. SEAD-3: Incinerator Cooling Water Pond (3:40 p.m.)
   - Refer to the AEHA report for background information.

6. SEAD-14: Refuse Burning Pits (3:45 p.m.)
   - Location has changed since the AEHA report.
   - RI/FS work has been initiated.

7. SEAD-24: Abandoned Powder Burning Pit (3:50 p.m.)
   - Refer to the AEHA report for background information.

8. SEAD-22: Sewage Treatment Plant No. 314 (4:00 p.m.)
   - Refer to the AEHA report for background information.

II. TUESDAY, SEPTEMBER 11, 1990

A. 7:30 a.m. - 8:30 a.m. and 9:30 a.m. - 11:30 a.m.:
Records review, Building 123.

B. 8:30 a.m. - 9:30 a.m. and 11:30 a.m. - 4:00 p.m.:
Visual site inspection. Escorted by Randy Battaglia.

1. SEAD-10: Present Scrap Wood Site (8:30 a.m.)
   - The wood pile was smoking. It was reported by SEAD personnel that the fire department periodically holds a training exercise using only the scrap wood pile as fuel (See Appendix A, SEAD-10).

2. SEAD-9: Old Scrap Wood Site (8:50 a.m.)
   - Scrap wood is disposed at this site.
   - Refer to the AEHA report for background information.

3. SEAD-13: IRFNA Disposal Site (8:55 a.m.)
   - Possible location of the pits may be either south of the road leading to the pond or southwest of the pond.
   - Refer to the AEHA report for background information.

4. SEAD-59: Fill Area west of Building 135 (9:10 a.m.)
   - Site was recently added to the SWMU list by SEAD personnel.
   - Measurements of the unit were taken.

5. SEAD-5: Sewage Sludge Waste Piles (9:20 a.m. and 11:30 a.m.)
   - Measurements of the waste piles were taken at 11:30 a.m.
   - Sludge data is available.
   - Refer to the AEHA report for background information.

6. SEAD-26: Fire Training Pit (9:30 a.m. and 12:30 p.m.)
   - Measurements of the pit were taken at 12:30 p.m.
   - Refer to the AEHA report for background information.

7. SEAD-1: Building 307 - Hazardous Waste Container Storage Facility (1:10 p.m.)
   - Only pictures of the exterior of the building were taken.
   - Refer to the AEHA report for background information.

8. SEAD-2: Building 301 - PCB Transformer Storage Facility (1:20 p.m.)
   - PCB transformers are stored here. Oils are tested for PCBs.
   - The floor of the building has been recently upgraded.
   - Refer to the AEHA report for background information.

9. SEAD-16: Building S-311 - Abandoned Deactivation Furnace (1:30 p.m.)
   - Soil sampling may be required.
   - Refer to the AEHA report for background information.

10. SEAD-17: Building 367 - Existing Deactivation Furnace (1:35 p.m.)
    - Soil analysis results are available.
    - Drawings of the new pad are available.
    - Facility is going through interim closure.
    - Violations of particulate emissions were observed in 1985.
    - Soils have been contaminated with lead from discharges from the stack incinerator (prior to installation of pollution control devices).
    - Refer to the AEHA report for background information.

11. SEAD-20: Sewage Treatment Plant No. 4 (1:45 p.m.)
    - Secondary treatment.
    - Flow scheme as follow: primary settling - trickling filter (1 unit) - secondary settling.
    - Sludge is discharged to the sand drying beds.
    - Refer to the AEHA report for background information.

12. SEAD-57: Explosive Ordnance Disposal Area (2:00 p.m.)
    - Measurements were taken.
    - Site was recently added to the SWMU list by SEAD personnel.

13. SEAD-23: Open Burning Ground (2:15 p.m.)
    - Groundwater monitoring data is available.
    - The site is approximately 30 acres.
    - There are nine burning pads.
    - Propellants are burned in the tray.
    - Refer to the AEHA report for background information.

14. SEAD-45: Demolition Area (adjacent to SEAD-23, 2:15 p.m.)
    - Refer to the AEHA report for background information.

15. SEAD-52: Buildings 608 and 612 - Ammunition Breakdown Area (2:45 p.m.)
    - Refer to the AEHA report for background information.

16. SEAD-60: Oil Discharge adjacent to Building 609 (2:55 p.m.)
    - Site was recently added to the SWMU list by SEAD personnel.
    - Measurements of the spill area were taken.

17. SEAD-62: Nicotine Sulfate Disposal Area near Buildings 606 or 612 (3:10 p.m.)
    - Site was recently added to the SWMU list by SEAD personnel.
    - The exact location of the disposal area is unknown.

18. SEAD-4: Munitions Washout Facility Leach Field (3:40 p.m.)
    - The drainage ditch runs between the water tank and the fill area. The ditch possibly drains to a pond located across the road.
    - Soil samples were collected from the pond area in the spring of 1990. Soil sampling was performed because the pond was being re-built. Seventy soil samples were collected. They were analyzed for 2,4,6-TNT, 2,4-DNT, and 2,6-DNT. All results were non-detectable.
    - Location: Previous report said wastewater discharged near Building 2084. From a worker, it has been reported that the wastewater discharged near Building 2079.
    - Refer to the AEHA report for background information.

19. SEAD-11: Old Construction Debris Landfill (3:50 p.m.)
    - Refer to the AEHA report for background information.
    - Measurements of the unit were taken.

II. WEDNESDAY, SEPTEMBER 12, 1990

A. 7:30 a.m. - 9:00 a.m.: Records review, Building 123.

B. 9:00 a.m. - 10:00 a.m.: Visual site inspection. Escorted by Randy Battaglia.

1. SEAD-33: Building 121 - Underground Waste Oil Tank (9:25 a.m.)
    - Refer to the AEHA report for background information.

2. SEAD-36: Building 121 - Waste Oil-Burning Boilers (2) (9:25 a.m.)
    - Refer to the AEHA report for background information.

3. SEAD-31: Building 117 - Underground Waste Oil Tank (9:40 a.m.)
    - The tank is located at the heavy equipment maintenance branch.
    - Refer to the AEHA report for background information.

C. 10:00 a.m. - 12:30 p.m.: Visual Site Inspection / Exclusion Area - Escorted by Randy Battaglia.

4. SEAD-63: Miscellaneous Components Burial Site / Exclusion Area (10:55 a.m.)
    - Pictures were taken by Randy Battaglia.

5. SEAD-12: Radioactive Waste Burial Sites / Exclusion Area (11:50 a.m.)
    - Pictures were taken by Randy Battaglia
    - The dry waste storage pit was excavated in 1986. Nothing was found.
    - The 5,000 gallon wastewater storage tank was excavated in 1986. The tank collapsed. Water and soil samples were collected.
    - Wastewater source: Laundry wastewater from washing contaminated clothing.

- In 16 years nothing has been dumped.
- Wastewater treatment laundry system inactive since 1962 or earlier.
- Dry storage pit - inactive since August, 1957. Contents removed in 1986.
- May, 1986 - Excavated and inspected. No radioactive wastes were found. Negative radioactive readings.
- Burial Pit #5: Metal parts buried here. Area where metal was coming out of the ground.
- Report to include wastewater tank, and dry storage pit.
- Refer to the AEHA report for background information.

D. 1:30 p.m. - 4:00 p.m.: Visual Site Inspection - Escorted by Randy Battaglia

6. SEAD-34: Building 319 - Underground Waste Oil Tanks (2), (1:45 p.m.)
   - Refer to the AEHA report for background information.

7. SEAD-37: Building 319 - Waste Oil-Burning Boilers (2) (1:45 p.m.)
   - Refer to the AEHA report for background information.
   - SEAD-40 is located near this building (Boiler Plant Blowdown Leach Pit).

8. SEAD-27: Building 360 - Steam Cleaning Waste Tank (2:00 p.m.)
   - Refer to the AEHA report for background information.
   - Closure plans are being developed.

9. SEAD-28: Building 360 - Underground Waste Oil Tanks (2) (2:10 p.m.)
   - Waste oil had been spilled around the fill points.
   - Refer to the AEHA report for background information.

10. SEAD-55: Building 357 - Tannin Storage (2:25 p.m.)
    - The tannin storage area could not be located.

11. SEAD-43: Building 606 - Old Missile Propellant Test Laboratory (2:35 p.m.)
    - No documented spills.

- Same location as SEAD-56.
- IRFNA may have been stored here.
- Soil sampling may be required.
- Concrete tank with pump and four vent pipes was observed in front of the building.
- Pesticides were mixed in the building. In 1988, a new building was constructed near the old building. SEAD planned to rinse trucks in the building. The building has not yet been used.
- A barren spot was observed in front of the building near the driveway. Approximately 15 feet long by 3 feet wide.

12. SEAD-50: Tank Farm (3:05 p.m.)
    - Four aboveground tanks currently exist.
    - Four tanks were present. Each tank was marked with an identifying sign. Each sign had the following information:
        1. Tank #88
           Asbestos B-1
           Portuguese
           Type Amosite
        2. Tank #17
           Antimony
           Grade B
           Boliva
           SB 65.15%
           Type Sulfide Ore
        3. Tank #8
           Antimony B
           Domestic and Boliva
           SB 68.24%
           Type Sulfide Ore
        4. Tank #302
           Rutile Ore
           Australia
           $T10_2$ 97.31%
    - The tanks at the tank farm were sold over a period of 15-20 years.

13. SEAD-9: Old Scrap Wood Site (3:30 p.m.)
    - Additional pictures were taken.

14. SEAD-10 : Present Scrap Wood Site (4:00 p.m.)
    - Pictures and measurements were taken.

III. THURSDAY, SEPTEMBER 13, 1990

A. 7:00 a.m. - 8:30 a.m.: Records review, Building 123.

B. 8:30 a.m. - 11:30 .am. and 2:00 p.m. - 4:00 p.m.:
Visual site inspection. Escorted by Randy Battaglia.

1. SEAD-32: Building 718 - Underground Waste Oil Tanks (2) (8:30 a.m.)
    - Refer to the AEHA report for background information.

2. SEAD-35: Building 718 - Waste Oil-Burning Boilers (3) (8:30 a.m.)
    - Refer to the AEHA report for background information.
    - SEAD-41 is located near this building (Boiler Plant Blowdown Leach Pit).

3. SEAD-61: Building 718 - Underground Waste Oil Tank (8:30 a.m.)
    - Tank referenced to as an accumulation tank.
    - Refer to the AEHA report for background information.

4. SEAD-29: Building 732 - Underground Waste Oil Tank (8:45 a.m.)
    - Refer to the AEHA report for background information.

5. SEAD-18: Building 709 - Classified Document Incinerator (8:55 a.m.)
    - Pictures were taken by Randy Battaglia.
    - Ash has been tested. It was found to be non-hazardous.

6. SEAD-21: Sewage Treatment Plant No. 715 (9:10 a.m.)
    - Secondary treatment. The permitted capacity of the facility is 300,000 gallons per day. The design capacity of the facility is 750,000 gallons per day.

- Flow scheme as follows: Primary settling-RBCs (2 units) - secondary settling - sand filters - post aeration.
- Domestic wastewater. May be some wastewater from oil/water separators.
- Discharges to Reeder Creek (Trout stream).
- Refer to the AEHA report for background information.

7. SEAD-7: Shale Pit (9:20 a.m.)
   - Pit is being filled in with demolition material. It was reported by SEAD personnel that the demolition debris does not include construction debris such as plywood, boards, roofing material, siding, etc. (See Appendix A, SEAD-7).
   - Refer to the AEHA report for background information.

8. SEAD-46: Small Arms Range (9:40 a.m.)
   - Troops train in this area. Only "blank" ammunition is used.

9. SEAD-13: IRFNA Disposal Site (9:50 a.m.)
   - Additional pictures were taken.

10. SEAD-30: Building 118 - Underground Waste Oil Tank (10:00 a.m.)
    - 550 gallon tank.
    - Refer to the AEHA report for background information.

11. SEAD-48: Pitchblend Storage Igloos (10:30 a.m.)
    - No pictures were taken due to security requirements.
    - Resources have been removed. Igloos were certified decontaminated.
    - Closure report has been developed.

12. SEAD-38: Building 2079 - Boiler Blowdown Leach Pit (10:35 a.m.)
    - Refer to the AEHA report for background information.

13. SEAD-47: Buildings 804, 807, and 815-Radiation Calibration Source Storage (10:40 a.m.)
    - No pictures were taken due to security requirements.

14. SEAD-22: Sludge Treatment Plant No. 314 (10:50 a.m.)
    - Additional pictures were taken.

15. SEAD-5: Sewage Sludge Waste Piles (11:00 a.m.)
    - Additional pictures were taken.

16. SEAD-59: Fill Area west of Building 135 (11:15 a.m.)
    - Additional pictures were taken.

17. SEAD-52: Buildings 608 and 612 Ammunition Breakdown Area - (2:15 p.m.)
    - Additional pictures were taken.

18. SEAD-60: Oil Discharge adjacent to Building 609 - (2:15 p.m.)
    - Additional pictures were taken.

19. SEAD-44: Quality Assurance Test Laboratory (2:30 p.m.)
    - Exact location is unknown.

20. SEAD-2: Building 301 - PCB Transformer Storage Facility (2:40 p.m.)
    - Additional pictures were taken.

21. SEAD-58: Debris Area near Booster Station 2131 (2:45 p.m.)
    - Pictures of the Booster Station were taken.
    - No pictures of the Debris Area were taken because the exact location was unknown.
    - Supposedly DDT has been disposed in this area.
    - Debris was originally observed from a helicopter.

22. SEAD-16: Building S-311- Abandoned Deactivation Furnace (2:55 p.m.)

- The interior of the building was toured. Additional pictures were taken.
- The pipes on top of the building may have conveyed propellants. Propellants may have been stored inside the building.
- Shells were observed on the floor.
- Since contamination was found at SEAD-17, you would also suspect contamination at SEAD-16.
- Standing water at the basement of the furnace room was observed.
- Refer to the AEHA report for background information.

23. SEAD-33: Building 121 - Underground Waste Oil Tank (3:45 p.m.)
    - Additional pictures were taken.
    - Refer to the AEHA report for background information.

IV. FRIDAY, SEPTEMBER 14, 1990

A. 7:00 a.m. - 9:15 a.m.: Records review, Building 123 by Julie Hubbs.

Randy Battaglia was interviewed. The following information was discussed:

The unit descriptions from the The AEHA report which need to be revised are:

- SEAD-4: Munitions Washout Facility Leach Field
- SEAD-12: Radioactive Waste Burial Sites
- SEAD-17: Building 367 - Existing Deactivation Furnace
- SEAD-27: Building 360 - Steam Cleaning Waste Tank
- SEAD-48: Pitchblend Storage Igloos.
- SEAD-51: Herbicide Usage - Perimeter of High Security Area.

Sites with groundwater monitoring data:

- SEAD-6: Abandoned Ash Landfill
- SEAD-23: Open Burning Ground.

Sites with sampling data:

- SEAD-2: Building 301 - PCB Transformer Storage Facility
- SEAD-4: Munitions Washout Facility Leach Field
- SEAD-5: Sewage Sludge Waste Piles

- SEAD-12: Radioactive Waste Burial Sites
- SEAD-17: Building 367 - Existing Deactivation Furnace
- SEAD-18 and SEAD-19: Classified Document Incinerators

B. 7:30 a.m. - 8:30 a.m.: Visual site inspection by Dimitra Syriopoulou escorted by Mark Paprocki.

1. SEAD-42: Building 106 - Preventive Medicine Laboratory (7:30 a.m.)
   - Pictures were taken.

2. SEAD-25: Fire Training and Demonstration Pad (7:35 a.m.)
   - Additional pictures were taken.

3. SEAD-1: Building 307- Hazardous Waste Container Storage Facility (7:40 a.m.)
   - Additional pictures of the exterior of the building were taken.
   - No pictures of the interior were taken.

4. SEAD-6: Abandoned Ash Landfill (7:50 a.m.)
   - Additional pictures were taken.

5. SEAD-8: Non-Combustible Fill Area (7:50 a.m.)
   - Additional pictures were taken.

6. SEAD-14: Refuse Burning Pits (7:50 a.m.)
   - Additional pictures were taken.

7. SEAD-15: Building 2207 - Abandoned Solid Waste Incinerator - (7:50 a.m.)
   - Additional pictures were taken.

8. SEAD-49: Building 324 - Columbite Ore Storage (7:45 a.m.)
   - The storage area could not be located.

9. SEAD-11: Old Construction Debris Landfill (8:10 a.m.)
    - Additional pictures were taken.

SWMU Sites where no pictures were taken:

SEAD-1: Building 307 - Hazardous Waste Container Storage Facility (interior of the building).

SEAD-19: Building 801 - Classified Document Incinerator

SEAD-47: Buildings 804, 807 and 815 - Radiation Calibration Source Storage

SEAD-48: Pitchblend Storage Igloos

SEAD-51: Herbicide Usage - Perimeter of High Security Area.

SEAD-53: Munitions Storage Igloos

SWMU Sites which were not photographed because their exact location was unknown.

SEAD-39: Building 121 - Boiler Plant Blowdown Leach Pit

SEAD-40: Building 319 - Boiler Plant Blowdown Leach Pit

SEAD-41: Building 718 - Boiler Plant Blowdown Leach Pit

APPENDIX C

APPENDIX C

Summary of Visual Inspection, Seneca Army Depot Activity,
November 27 through 29, 1990

FIELD REPORT

SOLID WASTE MANAGEMENT UNIT CLASSIFICATION STUDY
SENECA ARMY DEPOT, ROMULUS, NEW YORK
TASK AM-6: INVESTIGATION OF ADDITIONAL SITES

DATE: November 27 through 29, 1990
BY: Julie Hubbs, P.E.

I. TUESDAY, NOVEMBER 27, 1990

A. 7:00 a.m.: Arrived at the Seneca Army Depot (SEAD) Main Gate, Post 1, on NYS Route Highway 96. A pass was obtained.

B. 7:30 a.m. - 9:30 a.m.: Meeting, Building 123

Participants:
Randy Battaglia, SEAD
Julie Hubbs, ERCE
Gary Kittell, SEAD

C. 9:30 a.m. - 1:00 p.m.: Visual site inspection. Escorted by Randy Battaglia.

1. SEAD-16: Building S-311 - Abandoned Deactivation Furnace (9:30 a.m.)
   - The site was again inspected to determine the approximate locations for soil sampling.
   - The drawing provided by SEAD did not show the fence which borders the unit. Measurements were taken so that the approximate location of the fence line could be placed on the map.
   - Randy stated that the building southwest of S-311 may have been used to store propellants.
   - Additional pictures were taken.

2. SEAD-1: Building 307 - Hazardous Waste Container Storage Facility (10:00 a.m.)
   - Pictures of inside the building were taken.

3. SEAD-68: Building S-335 - Old Pest Control Shop (10:15 a.m.)
   - The southeast portion of the building was inspected. This building is presently used for fire training.
   - The frame building is covered with white clapboard. The floors are concrete. The truss roof is shingled. Trailers are on the east and west sides of the building. The south end of the building has a roll-up door. Entrance to the north end of the building is through a standard door. A paved drive is on the east side of the building. The area north of the building is also paved.
   - The north portion of the building was locked. It appeared through the window that this section of the building was empty. Debris was observed on the floor.
   - An old boiler is housed in the middle section of the building.
   - The building has one bathroom on the south end.
   - Pictures of the unit were taken.

4. SEAD-26: Fire Training Pit (10:30 a.m.)
   - The drawings provided by SEAD did not show the pit on the storage pad. Measurements were taken.
   - Debris had been dumped on the south end of the pad. Pictures of the debris area were taken.

5. SEAD-64: Debris Landfill south of Storage Pad (11:00 a.m.)
   - Measurements of the area were taken.
   - The area has a "no dumping" sign.
   - The area appeared to have been disturbed.
   - Pictures of the site were taken .

6. SEAD-13: IRFNA Disposal Site
   - The area was revisited to determine if the disposal location could be found. The IRFNA report showed the site approximately 300 feet south of the East-West Base Line Road. This is the area where the aboveground pipes were observed.
   - Iron piping with valves were sticking out of the ground on the east and west sides of the pond.

- A fire hydrant for the old water line was observed on the west side of the pond. The 1960 report stated that the stainless steel ejector was operated by water pressure using the Depot Water System. The abandoned water line may have been the water source used.
- Aboveground pipes which looked like emergency showers were observed on the east and west sides of the pond. The 1960 IRFNA report stated that a deluge shower was used for personnel decontamination.
- Pictures of the aboveground piping were taken.

D. 1:30 p.m. - 4:30 p.m.: Records review, Building 123.

II. WEDNESDAY, NOVEMBER 28, 1990

A. 7:00 a.m. - 7:30 a.m.: Records review, Building 123.

B. 7:30 a.m. - 8:30 a.m.: Visual site inspection. Escorted by Dale Larson, Senior Pest Controller.

1. SEAD-43 and 56: Building 606
   - Building 606 has been used for herbicide and pesticide storage since 1976. Prior to this, the building was referred to as the Old Missile Propellant Test Laboratory.
   - In 1978, all the drains were sealed.
   - The sinks in the mixing room were all equipped with backflow preventers. One of the sinks had no drain.
   - The structure has cement floors and walls, and ceilings with steel girders. The floors were sealed approximately 3 years ago. The building is equipped with explosion proof lights and wiring. Approximately 2 years ago, smoke and heat detectors were installed in every room and hall. All are hooked up to the fire department.
   - The bulk and suspended registration room is used for storage of suspended items (i.e., items containing chlorinated hydrocarbons).
   - Asbestos work is performed in a portion of the area previously called the light equipment room.

- The toilet room, adjacent to the herbicide storage room, is not being used.
- Items observed in the herbicide storage room included Round-up, Arsenal, and Low Volume 2,4-D. The low volume 2,4-D is going to be shipped to another Army installation. Dale has been checking the containers to ensure that there were no leaks.
- Items observed in the pesticide storage room included Sevin Carbaryl, Cutter Repellent, Strychnine, and Diazinon 4E Spray.
- The fabricated building, which is located west of Building 606, is the Herbicide Rinsate Building. The rinsate drains to a concrete vault which houses a storage container. The system has not been put into operation.

C. 8:30 a.m. - 10:00 a.m.: Records review, Building 123.

D. 10:00 a.m. - 11:30 a.m.: Interview with Dennis Wells (Chief of Seneca Army Depot's General Supply Division, which is a part of the Seneca Army Depot's Directorate of Supply). Personnel present included Randy Battaglia (SEAD) and Keith Hoddinott (USAEHA).

Mr. Wells was asked the following questions:

- SEAD-49: Building 324 - Columbite Ore Storage
  Question: When was the columbite ore removed from Building 357? Where is it now stored?
  Reply: Columbite ore was removed from Building 357 in 1984 or 1985. The ore is now stored in Building 356.

- SEAD-55: Building 357 - Tannin Storage
  Question: Is tannin stored in Building 357?
  Reply: Tannin is stored in Section 2 of Building 357.

- SEAD-50: Tank Farm
  Question: What items were stored at the tank farm?
  Reply: Mr. Wells contacted a retired GSA representative and found that antimony, rutile, asbestos, and silicon carbide were the only

materials that had been stored at the tank farm.

Question: When and how many tanks were sold to farmers?
Reply: In 1987 and 1988, three to five tanks were sold to farmers.

E. 12:30 p.m. to 1:30 p.m.: Visual site inspection. Performed by Julie Hubbs (ERCE) and Keith Hoddinott (USAEHA).

1. SEAD-50: Tank Farm
   - An approximate number of storage tanks was estimated by walking the site and counting the number of barren areas covered with gravel. There were approximately seven rows where tanks had previously existed. The first row to the north appeared to have approximately six tanks. The two most southern rows appeared to have about 14 tanks each. Thus, the estimated number of tanks was approximately 60.

F. 1:30 p.m. - 2:30 p.m.: Visual site inspection. Performed by Julie Hubbs (ERCE), Keith Hoddinott (USAEHA) and Randy Battaglia (SEAD).

1. SEAD-69: Disposal Area near Building 606
   - The area located south of Building 606 was visually inspected. SEAD personnel had reported that garbage (i.e., fence posts, 2,4-D cans and pesticide cans) had been disposed of in an area south of the herbicide and pesticide storage area. A pile, covered with vegetation, was observed in the area. Also, a sunken area, which contained wire fence, concrete posts, and other debris was observed to the north of the pile area.
   - The septic tank system to Building 606 was again visually inspected. Pictures were taken.

G. 2:30 p.m. - 3:00 p.m.: Records review, Building 123.

H. 3:00 p.m. - 3:30 p.m.: Visual site inspection. Performed by Julie Hubbs

1. SEAD-42: Preventative Medicine Laboratory
   - SEAD-42 was revisited to determine the operating practices of the unit. The lab is used only for chemical analysis. Potable water analysis were previously performed at Fort Drum. SEAD personnel have reported that potable water analyses are currently performed by a contracted lab. The wastes generated at the lab are sent to Fort Drum.

III. THURSDAY, NOVEMBER 29, 1990

A. 7:00 a.m. - 7:30 a.m.: Records review, Building 123.

B. 7:30 a.m. - 11:30 a.m.: Visual site inspection. Performed by Julie Hubbs (ERCE) and Randy Battaglia (SEAD).

1. SEAD-55: Building 357 - Tannin Storage (7:30 a.m.)
   - Pictures were taken.

2. SEAD-49: Building 356 - Columbite Ore Storage (7:45 a.m.)
   - Pictures were taken.

3. SEAD-44: Quality Assurance Test Laboratory/Location A (8:00 a.m.)
   - The site was revisited so that measurements could be taken.

4. SEAD-44: Quality Assurance Test Laboratory/Location B (8:30 a.m.)
   - The site consisted of a concrete pad, a flag pole and a metal shed. Pictures of the area were taken. Measurement of the concrete pad were also taken.

5. SEAD-64: Garbage Disposal Area/Location B: Classification Yards (9:00 a.m.)
   - Piles, covered with vegetation, were observed. Pictures were taken.

6. SEAD-4: Munitions Washout Facility Leach Field (9:30 a.m.)
   - The site was visually inspected. Measurements and pictures were taken.

7. SEAD-24: Abandoned Powder Burning Pit (10:00 a.m.)
   - The area is enclosed by a berm. The area south of the berm (the wooded area) may have also been a part of the unit. The wooded area was covered with shale. Pictures were taken.

C. 10:15 a.m. - 11:30 a.m.: Visual site inspection. Performed by Julie Hubbs (ERCE).

1. SEAD-69: Building 606 - Disposal Area
   - Dale Larson, the Senior Pest Controller for SEAD, located the site. Pictures of the area were taken.

2. SEAD-64: Garbage Disposal Area/Location C: Proposed Landfill Site.
   - Pictures were taken.

D. 12:30 p.m. - 3:30 p.m.: Visual site inspection. Performed by Julie Hubbs (ERCE) ad Randy Battaglia (SEAD).

1. SEAD-64: Garbage Disposal Area/Location D, west of Building 2203 (12:30 p.m.)
   - Pictures of the area were taken.

2. SEAD-66: Pesticide Storage near Buildings 5 and 6 (1:00 p.m.)
   - The exact location of the pesticide storage area is unknown. It could possibly be the small shed adjacent to Building 5.
   - Pictures of the area were taken.

3. SEAD-67: Dump Site east of Sewage Treatment Plant No. 4 (1:30 p.m.)
   - Pictures of the area were taken. Piles, covered with vegetation, were observed in the area.

4. SEAD-65: Acid Storage/Location A (2:00 p.m.)
   - Measurements of the area were taken.
   - Portions of a concrete foundation were observed.
   - Pictures were taken.

5. SEAD-65: Acid Storage/Location B (2:30 p.m.)
   - Measurements of the area were taken.
   - Portions of a concrete foundation were observed.
   - Pictures were taken.

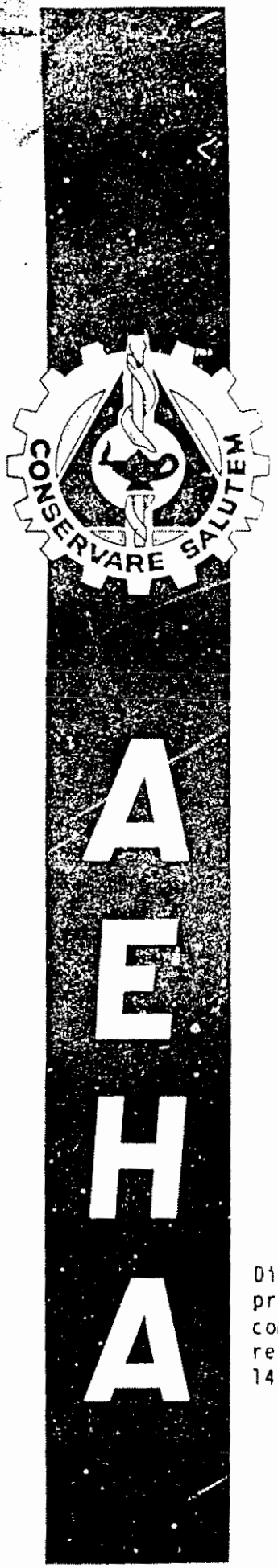
6. SEAD-66: Acid Storage/Location C (3:00 p.m.)
   - A concrete pad and flag pole were observed.
   - Pictures were taken.

7. SEAD-58: Debris Area near Booster Station 2131 (3:30 p.m.)
   - The debris area could not be located. Randy stated that they would try to locate the area.

APPENDIX D

APPENDIX D

Evaluation of Solid Waste Management Units,
Seneca Army Depot Activity, Interim Final Report,
Groundwater Contamination Survey No. 38-26-0868-88,
U.S. Army Environmental Agency, July 1987



UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010-5422

INTERIM FINAL REPORT
GROUND-WATER CONTAMINATION SURVEY NO. 38-26-0868-88
EVALUATION OF SOLID WASTE MANAGEMENT UNITS
SENECA ARMY DEPOT
ROMULUS, NEW YORK
27-31 JULY 1987

Distribution limited to U.S. Government agencies only; protection of privileged information evaluating another command; May 88. Requests for this document must be referred to Commander, Seneca Army Depot, Romulus, NY 14541-5000.

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DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

24 MAY 1988

HSHB-ME-SG

MEMORANDUM FOR: Commander, U.S. Army Materiel Command, ATTN: AMCSG, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

SUBJECT: Interim Final Report, Ground-water Contamination Survey No. 38-26-0868-88, Evaluation of Solid Waste Management Units, Seneca Army Depot, Romulus, New York, 27-31 July 1987

EXECUTIVE SUMMARY

The purpose and the recommendation of the enclosed report follow:

a. Purpose. To identify, describe, and evaluate all solid waste management units (SWMU's) on Seneca Army Depot and to delineate those units requiring further sampling, investigation, or corrective action.

b. Recommendations. To ensure regulatory compliance:

(1) Investigate the offpost extent of the contamination plume emanating from the area containing the Incinerator Cooling Water Pond (SEAD-3), the Abandoned Ash Landfill (SEAD-6), and the Refuse Burning Pits (SEAD-14); and

(2) Implement a sampling program at 11 of the SWMU's.

FOR THE COMMANDER:

PAUL R. THIES
LTC, MS
Chief, Waste Disposal Engineering Division

Encl

CF:
DA, USAEHSC, ATTN: CEHSC-E/CEHSC-F (w/encl)
HQDA(DASG-PSP) (wo/encl)
Cdr, AMC, ATTN: AMCEN-A (w/encl)
Cdr, DESCOM, ATTN: AMSDS-T (w/encl)
Cdr, SEAD, ATTN: SDSSE-HE (2 cy) (w/encl)
Cdr, MEDDAC, Ft Devens, ATTN: PVNTMED Svc (2 cy) (w/encl)
Cdr, WRAMC, ATTN: PVNTMED Svc (w/encl)
Cdr, USATHAMA, ATTN: AMXTH-IR (w/encl)
Cdr, USAEHA Fld Spt Actv, Ft Meade (w/encl)

Interim Final Rpt, Ground-Water Contamination Surv No. 38-26-0868-88, 27-31 Jul 87

CONTENTS

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ME-SG

INTERIM FINAL REPORT
GROUND-WATER CONTAMINATION SURVEY NO. 38-26-0868-88
EVALUATION OF SOLID WASTE MANAGEMENT UNITS
SENECA ARMY DEPOT, ROMULUS, NEW YORK
27-31 JULY 1987

1. AUTHORITY. Letter, HQ AMC, AMCEN-A, 13 November 1986, subject: Request for Technical Support, Evaluation of Solid Waste Management Units at U.S. Army Materiel Command (AMC) Installations.

2. PURPOSE. To identify, destribe, and evaluate all solid waste management units (SWMU's) on Seneca Army Depot (SEAD) and to delineate those units requiring further sampling, investigation, or corrective action.

3. GENERAL.

a. Personnel Contacted. Appendix A contains a list of personnel contacted during the survey.

b. Location and Mission of SEAD. Seneca Army Depot is located on 10,587 acres in the heart of the Finger Lakes Region in Seneca County, New York, between Cayuga Lake and Seneca Lake. State Route 96A is the western boundary and State Route 96 is the eastern boundary. The nearest cities are Geneva (14 miles to the northwest) and Ithaca (31 miles to the south). The villages of Waterloo and Seneca Falls are approximately 12 miles to the north. The nearest major cities are Rochester (50 miles to the northwest) and Syracuse (53 miles to the northeast). Figure 1 shows the location of the depot. The current mission of SEAD is to receive, store, maintain, issue, ship, demilitarize, and dispose of assigned commodities, including ammunition, explosives, propellants, industrial plant equipment, special weapons, and General Services Administration materials.

c. Background. Seneca Army Depot has applied for a Part B permit to operate a hazardous waste storage facility (SEAD-1), a polychlorinated biphenyl (PCB) storage facility (SEAD-2), and a deactivation furnace (SEAD-17). The most recent revision of the application was sent to the State at the beginning of April 1988. The demolition ground (SEAD-23) is under interim status. Under the Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Amendments of 1984 (reference 1), Part B permits issued after 8 November 1984 shall require identification and corrective action at any SWMU located on the installation which is releasing hazardous constituents or hazardous wastes to the environment. This requirement applies to all SWMU's regardless of when the waste was placed in the SWMU's.

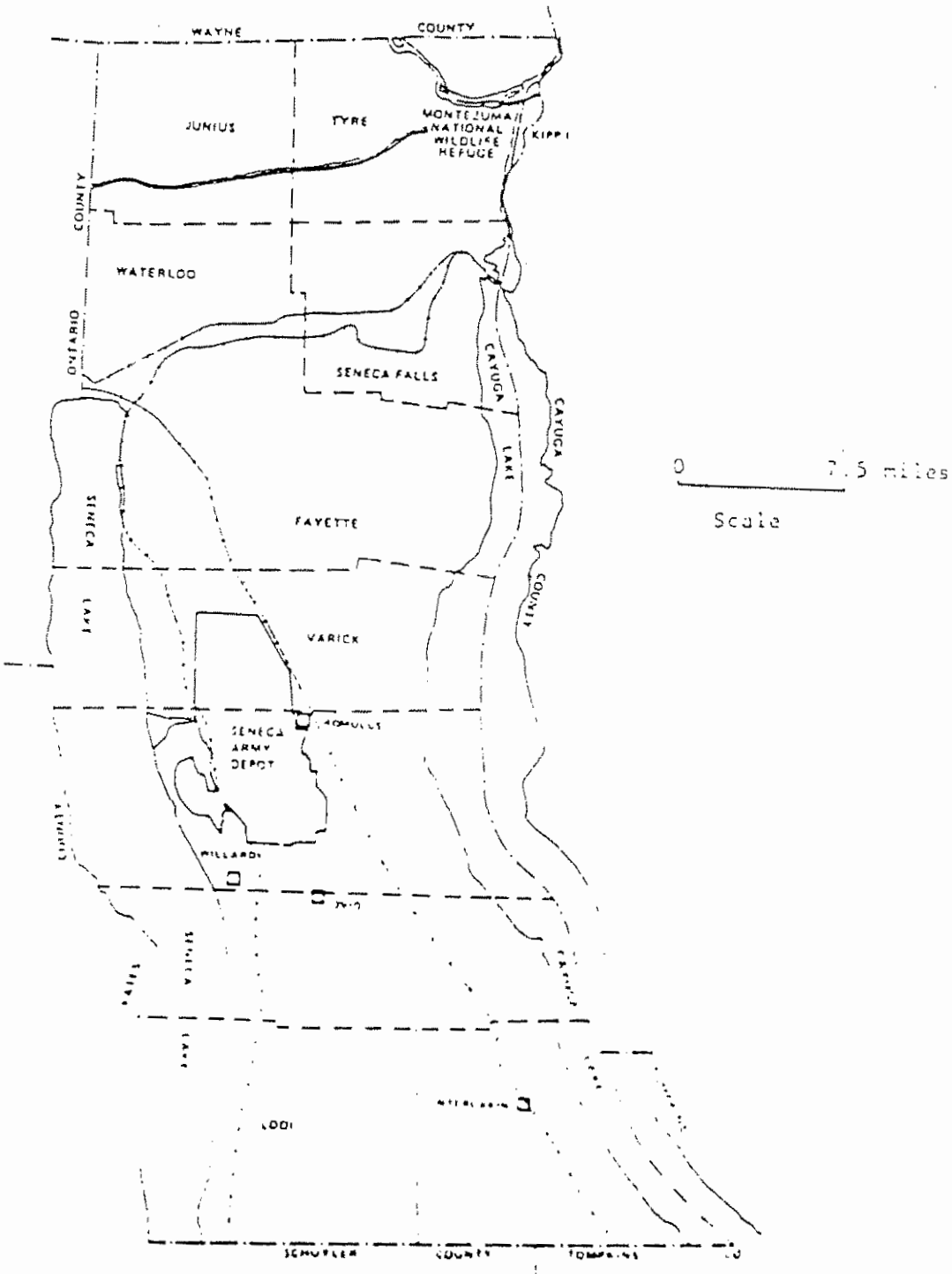


FIGURE 1. Location of Seneca Army Depot (SEAD), NY

4. FINDINGS AND DISCUSSION.

a. Geohydrology.

(1) Geology. Seneca Army Depot is located on the western side of a series of north-south trending rock terraces which separate Seneca Lake and Cayuga Lake. The rock terraces range in elevation from 490 to 1,600 feet above mean sea level (MSL). Elevations on SEAD range from 450 feet above MSL on the western boundary to 760 feet above MSL in the southeast corner. The surface of the depot generally consists of a west and north sloping surface. In the vicinity of SEAD, unconsolidated Pleistocene glacial till deposits overlie Devonian age bedrock consisting primarily of shales. Thickness of the glacial deposits on SEAD ranges from 1 to 10 feet. The bedrock unit underlying SEAD is the Moscow shale, a black, fissile, highly jointed unit with thin interbedded calcareous shale and limestone layers. The Moscow shale dips to the south at 30 to 35 feet per mile beneath the depot.

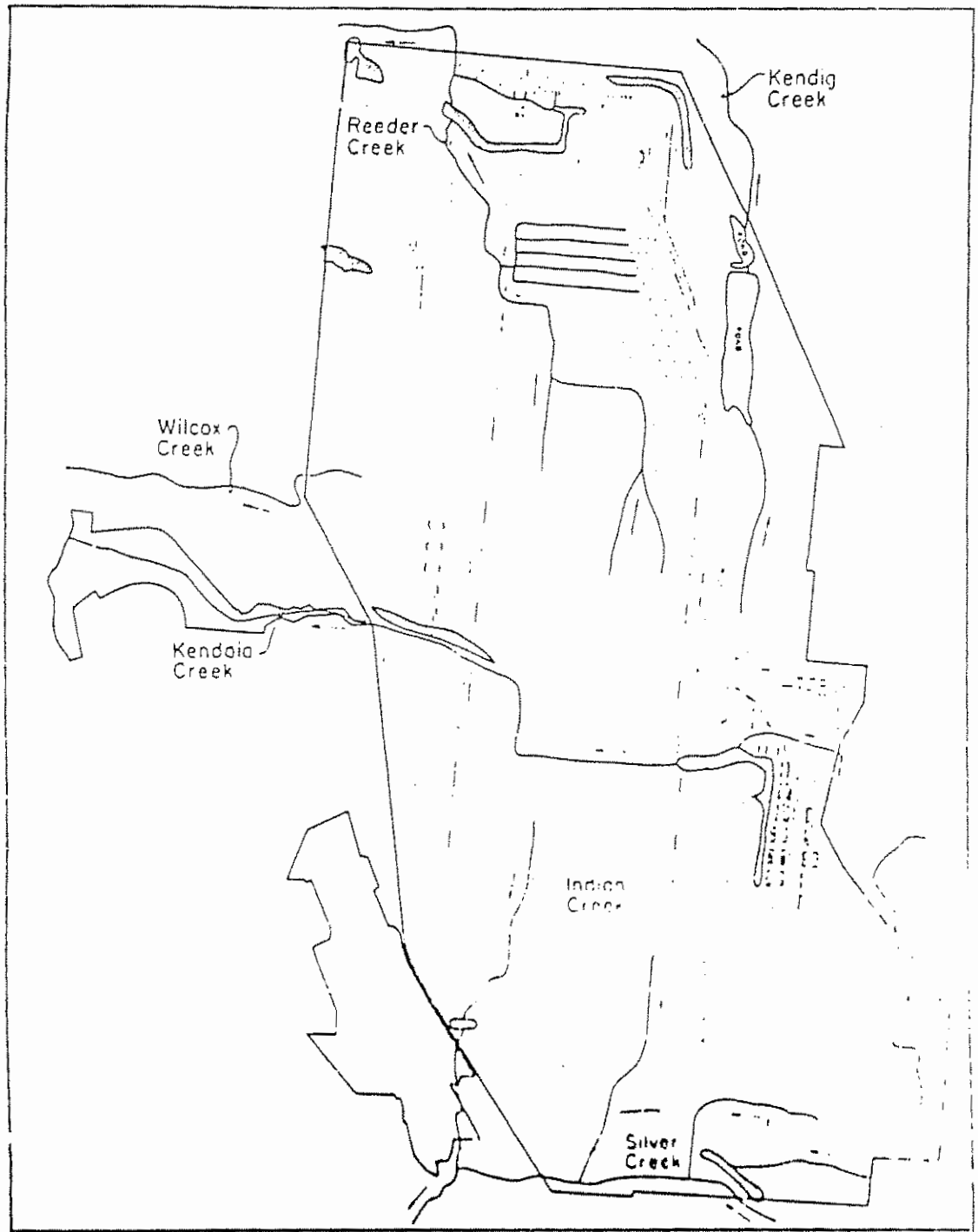
(2) Ground Water. Ground water on SEAD is generally found in the joints and bedding planes of the shale at depths ranging from 1 to 23 feet below the surface. The ground-water flow direction is to the west toward Seneca Lake.

(3) Surface Water. Figure 2 is a map showing the surface drainage pattern on SEAD. The surface drainage from SEAD flows in two general directions via eight drainageways. Surface runoff in the southern portion of the depot flows through ditches and streams into Indian and Silver Creeks which flow into Seneca Lake just south of the airfield. The administration area and the central part of SEAD are drained by Kendaia Creek which flows into Seneca Lake near the Lake Housing Area. Reeder Creek drains the major portion of the northwest and north-central part of SEAD. The northeast part of the depot, which includes a marshy area called the Duck Ponds, drains into Kendig Creek and eventually flows north into the Cayuga-Seneca Canal and to Cayuga Lake.

b. Development of the SWMU List for SEAD.

(1) SEAD SWMU Submission. Seneca Army Depot sent information on their SWMU's to the U.S. Environmental Protection Agency (EPA) Region II on 20 November 1986 and to the New York State Department of Environmental Conservation (NYDEC) on 2 February 1987. The two submittals were slightly different due to different requirements by the NYDEC for reporting SWMU's. A total of 35 sites and 4 areas with waste oil tanks were identified on the submission.

(2) SWMU's Added and Subtracted by the Project Officer. After reviewing numerous documents, aerial photos, maps, and conducting a visual site inspection at SEAD during 28 to 31 July 1987, a revised SWMU list was developed by the project officer. Fifteen sites were removed from the list because tney did not fit the definition of a SWMU, 16 sites were added, and 3 more areas with waste oil tanks were added. The Table is a list of the sites removed from the list.



Finure 2. Surface Drainage Map,
Seneca Army Depot,
Romulus, NY

LEGEND

Drainage Channel with Flow Direction

Areas of Seasonal Flooding

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TABLE. SITES DELETED FROM THE SEAD SWMU SUBMISSION

Unit Name	Why Deleted
Preventive Medicine Lab	Not waste handling
Old Missile Propellant Test Lab (Bldg 606)	Not waste handling
Quality Assurance Test Area	Not waste handling
Demolition Area (late 1960's)	Combined with Demolition Ground (SEAD-23)
Small Arms Range	Not waste handling
Radiation Calibration Source Storage (Bldgs 804, 807, 815)	Material storage, not waste storage
Pitchblende Storage Bunkers	Material storage, not waste storage
Columbite Ore Storage (Bldg 324)	Material storage, not waste storage
Tank Farm	Material storage, not waste storage
Herbicide Usage - perimeter of high security area	Not waste handling
Ammunition Breakdown Area (Bldgs 608, 612)	Not waste handling
Munitions Storage Igloos	Material storage, not waste storage
Asbestos Storage Igloos	Material storage, not waste storage
Tannin Storage Igloos	Material storage, not waste storage
Herbicide and Pesticide Storage	Material storage, not waste storage

(3) Final SWMU List. The final SWMU list consists of 41 units which includes 10 underground waste oil storage tanks. Appendix B includes a location map and the most complete SWMU list possible at this time. Appendix C provides background and recommended sampling information on each of the 41 units identified. Appendix D is a list of references used in gathering and compiling information for the SWMU list.

c. Determinations for Future Sampling or Investigations.

(1) No additional sampling or work is necessary at the following sites:

(a) SEAD-1. Bldg 307 - Hazardous Waste Container Storage Area.

(b) SEAD-2. Bldg 301 - PCB Transformer Storage Area.

(c) SEAD-5. Sewage Sludge Waste Pile.

(d) SEAD-7. Shale Pit.

(e) SEAD-9. Old Scrap Wood Pile.

(f) SEAD-10. Present Scrap Wood Pile.

(g) SEAD-12. Radioactive Waste Burial Sites.

(h) SEAD-13. Inhibited Red Fuming Nitric Acid (IRFNA) Disposal Site.

(i) SEAD-15. Bldg 2207 - Abandoned Solid Waste Incinerator.

(j) SEAD-20. STP No. 4

(k) SEAD-21. STP No. 715

(l) SEAD-22. STP No. 314

(m) SEAD-27. Bldg 360 - Steam Cleaning Waste Tank.

(n) SEAD-28 through SEAD-34 (10 waste oil tanks).

(o) SEAD-35 through SEAD-37 (seven waste oil-burning boilers).

(p) SEAD-38 through SEAD-41 (four boiler plant blowdown leach pits).

(2) Investigation of the offpost contamination plume emanating from the area containing the following three SWMU's is necessary.

(a) SEAD-3. Incinerator Cooling Water Pond.

(b) SEAD-6. Abandoned Ash Landfill.

(c) SEAD-14. Refuse Burning Pits.

(3) Sampling of ground water (continuation or additional), soils, or waste is recommended at the following sites:

(a) SEAD-4. Munitions Washout Facility Leach Field.

(b) SEAD-8. Noncombustible Fill Area.

(c) SEAD-11. Old Construction Debris Landfill.

(d) SEAD-16. Bldg S-311 - Abandoned Deactivation Furnace.

(e) SEAD-17. Bldg 367 - Present Deactivation Furnace.

(f) SEAD-18. Bldg 709 - Classified Document Incinerator.

(g) SEAD-19. Bldg 801 - Classified Document Incinerator.

(h) SEAD-23. Demolition Ground.

(i) SEAD-24. Abandoned Powder Burning Pit.

(j) SEAD-25. Fire Training and Demonstration Pad.

(k) SEAD-26. Fire Training Pit.

5. CONCLUSIONS.

a. The final SWMU list consists of 41 units which includes 10 underground waste oil storage tanks.

b. Twenty-seven of the forty-one SWMU's do not require additional sampling at this time.

c. An area containing three of the forty-one SWMU's needs an offpost contamination migration study.

d. Eleven of the forty-one SWMU's need additional or continued ground-water sampling, or soils sampling, or waste sampling.

6. RECOMMENDATIONS. The following recommendations are made to ensure regulatory compliance.

a. Investigate the offpost extent of the contamination plume emanating from the area containing the Incinerator Cooling Water Pond (SEAD-3), the Abandoned Ash Landfill (SEAD-6), and the Refuse Burning Pits (SEAD-14) [40 CFR 264.101(c) and AR 200-1, paragraph 3-12].

b. Implement a sampling program at eleven of the SWMU's [40 CFR 264.101(a)].

7. TECHNICAL ASSISTANCE. Requests for any additional environmental services should be directed through appropriate command channels of the requesting activity to the Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-ME, Aberdeen Proving Ground, MD 21010-5422, with an information copy furnished the Commander, U.S. Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000. Technical advice and/or assistance may be referred to Ms. Kim M. Fleischmann or Mr. John W. Bauer, Waste Disposal Engineering Division, AUTOVON 584-2024 or commercial (301) 671-2024.

8. REFERENCES. Appendix D contains a list of references.

KIM M. FLEISCHMANN
Environmental Scientist
Waste Disposal Engineering Division

APPROVED:

JOHN W. BAUER P.G.
Program Manager
Ground Water and Solid Waste

APPENDIX A

PERSONNEL CONTACTED

1. Mr. Gary W. Kittell, Director, Directorate of Engineering and Housing (DEH).

2. Mr. Stephen M. Absolom, Chief, Engineering/Environmental Management Division (EEMD), DEH.

3. Mr. Randall W. Battaglia, Environmental Engineer, EEMD, DEH.

4. Mr. Thomas Enroth, Environmental Engineer, EEMD, DEH.

5. Mr. Thomas C. Battaglia, Safety and Occupational Health Manager, Safety Office, Directorate of Logistics.

6. Mr. Harry George, Chief, Ammunition Mission Division, Directorate of Ammunition.

APPENDIX B

LIST OF SWMU's AND LOCATION MAP

Interim Final Rpt, Ground-Water Contamination Surv No. 38-26-0868-88, 27-31 Jul 87

TABLE. SOLID WASTE MANAGEMENT UNITS, SENECA ARMY DEPOT, ROMULUS, NEW YORK.

UNIT NUMBER	UNIT NAME
SEAD-1	Bldg 307 - Hazardous Waste Container Storage
SEAD-2	Bldg 301 - PCB Transformer Storage
SEAD-3	Incinerator Cooling Water Pond
SEAD-4	Munitions Washout Facility Leach Field
SEAD-5	Sewage Sludge Waste Pile
SEAD-6	Abandoned Ash Landfill
SEAD-7	Shale Pit
SEAD-8	Noncombustible Fill Area
SEAD-9	Old Scrap Wood Site
SEAD-10	Present Scrap Wood Site
SEAD-11	Old Construction Debris Landfill
SEAD-12	Radioactive Waste Burial Sites (3)
SEAD-13	IRFNA Disposal Site
SEAD-14	Refuse Burning Pits (2)
SEAD-15	Bldg 2207 - Abandoned Solid Waste Incinerator
SEAD-16	Bldg S-311 - Abandoned Deactivation Furnace
SEAD-17	Bldg 367 - Present Deactivation Furnace
SEAD-18	Bldg 709 - Classified Document Incinerator
SEAD-19	Bldg 801 - Classified Document Incinerator
SEAD-20	Sewage Treatment Plant No. 4
SEAD-21	Sewage Treatment Plant No. 715
SEAD-22	Sewage Treatment Plant No. 314
SEAD-23	Demolition Ground
SEAD-24	Abandoned Powder Burning Pit
SEAD-25	Fire Training and Demonstration Pad
SEAD-26	Fire Training Pit
SEAD-27	Bldg 360 - Steam Cleaning Waste Tank
SEAD-28	Bldg 360 - Underground Waste Oil Tanks (2)
SEAD-29	Bldg 732 - Underground Waste Oil Tank
SEAD-30	Bldg 118 - Underground Waste Oil Tank
SEAD-31	Bldg 117 - Underground Waste Oil Tank
SEAD-32	Bldg 718 - Underground Waste Oil Tanks (2)
SEAD-33	Bldg 121 - Underground Waste Oil Tank
SEAD-34	Bldg 319 - Underground Waste Oil Tanks (2)
SEAD-35	Bldg 718 - Waste Oil-Burning Boilers (3)
SEAD-36	Bldg 121 - Waste Oil-Burning Boilers (2)
SEAD-37	Bldg 319 - Waste Oil-Burning Boilers (2)
SEAD-38	Bldg 2079 - Boiler Blowdown Leach Pit
SEAD-39	Bldg 121 - Boiler Blowdown Leach Pit
SEAD-40	Bldg 319 - Boiler Blowdown Leach Pit
SEAD-41	Bldg 718 - Boiler Blowdown Leach Pit

APPENDIX C

SOLID WASTE MANAGEMENT UNITS AT SEAD

1. MAP LOCATION/SITE NUMBER. SEAD-1.

a. Unit Name. Bldg 307 - Hazardous Waste Container Storage Area.

b. Unit Characteristics.

(1) Unit Type. Hazardous waste storage building.

(2) Design Features. The 40 feet by 50 feet building consists of a 6-inch thick, one piece concrete slab floor with a 6-inch curb. The slab is reinforced with steel bars spaced 12 inches apart. The roof is constructed of corrugated zinc-coated steel with single sheets extending from the ridge to the edge. Corrugated steel sheets cover the sides of the building extending from 1 foot below the 2-inch by 12-inch headers to 6 inches below the top of the curb. A passive ventilation system is provided via the opening at the top of the walls. Figure C-1 shows a plan view of the building.

(3) Approximate Dates of Usage. 1981 to present.

(4) Operating Practices. Drums of hazardous waste generated in the shops are transported to the building and stored until disposal contracts are procured. Regular inspections are made by the environmental coordinator and the fire department.

(5) Present Condition and Status. The building is in very good structural condition and is managed appropriately. The building is included in the RCRA Part B Permit Application.

c. Specific Wastes Disposed. Wastes are stored, not disposed in the building.

d. Migration Pathways. If the wastes were spilled on the ground during transfer of the drums into the building, the soil and ground water would be impacted.

e. Evidence of Release. None.

f. Exposure Potential. Very low.

g. Recommendations for Sampling. None.

h. References. 20, 22.

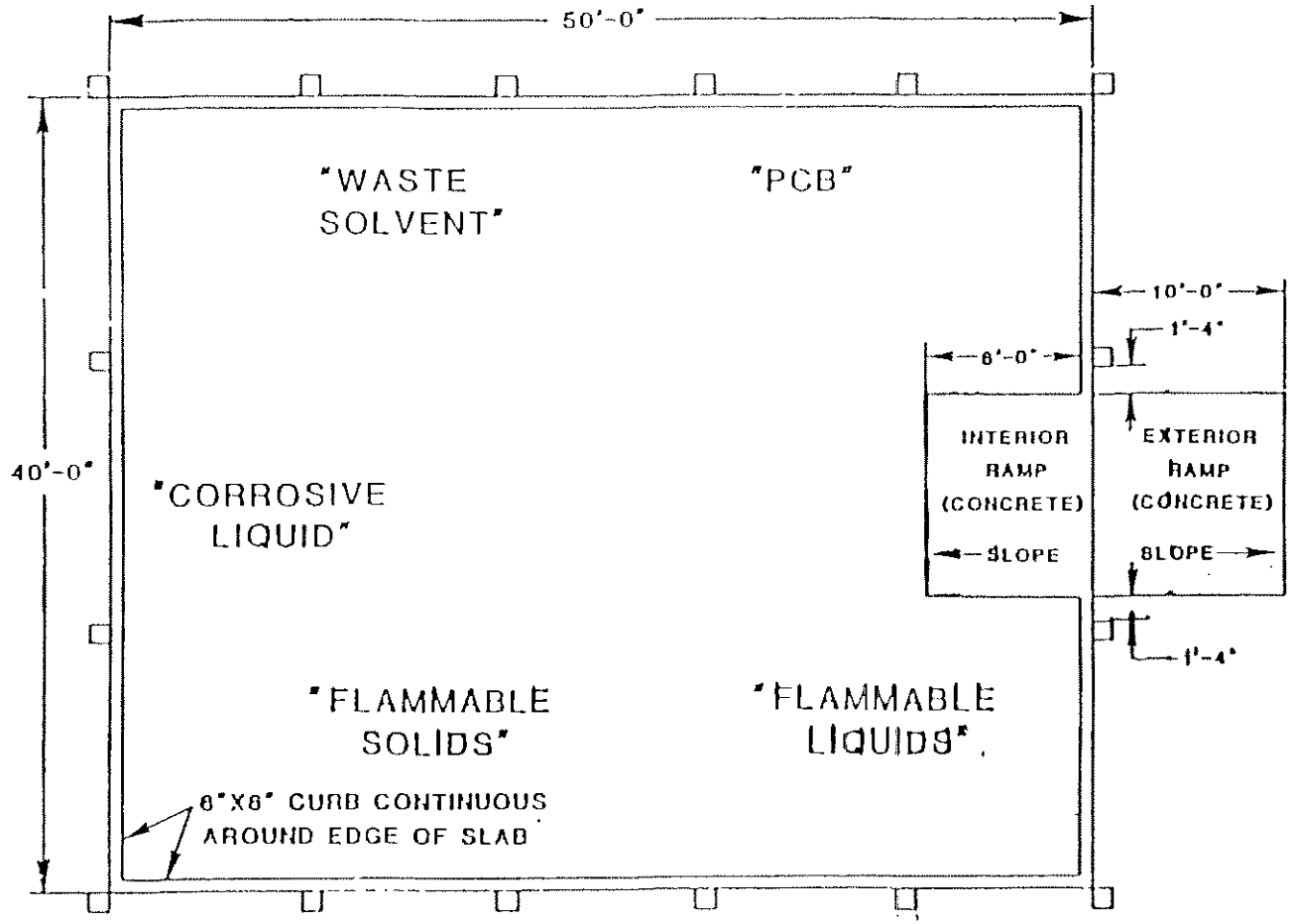

FIGURE C-1
PLAN VIEW OF HAZARDOUS WASTE CONTAINER STORAGE AREA

SENECA ARMY DEPOT
ROMULUS, NY

2. MAP LOCATION/SITE NUMBER. SEAD-2.

a. Unit Name. Bldg 301 - PCB Transformer Storage Area.

b. Unit Characteristics.

(1) Unit Type. Hazardous waste storage building.

(2) Design Features. The floor of the building consists of a 6-inch thick concrete slab with a 12-inch high discontinuous curb around the perimeter. Two overhead rollup doors create the breaks in the curbing. The flat roof is covered with tar paper. The 12-foot high walls are made of 12-inch thick scored tile. As shown in figure C-2, the building has four windows.

(3) Approximate Dates of Usage. 1980 to present.

(4) Operating Practices. Decommissioned transformer units and other suspected PCB-contaminated electrical equipment are delivered to the building by linemen. Sampling is conducted by the environmental coordinator to determine the concentrations of PCBs in the units and contaminated electrical equipment, then the items are disposed by the Defense Reutilization and Marketing Office (DRMO). Inspections are conducted regularly by the environmental coordinator and the fire department.

(5) Present Condition and Status. The building will be upgraded in the near future to meet conforming storage requirements and is included in the RCRA Part B Permit Application.

c. Specific Wastes Disposed. Wastes are stored, not disposed in the building.

d. Migration Pathways. If the wastes were spilled on the ground during transfer, the soil and ground water would be impacted.

e. Evidence of Release. None.

f. Exposure Potential. Very low.

g. Recommendations for Sampling. None.

h. References. 20, 22.

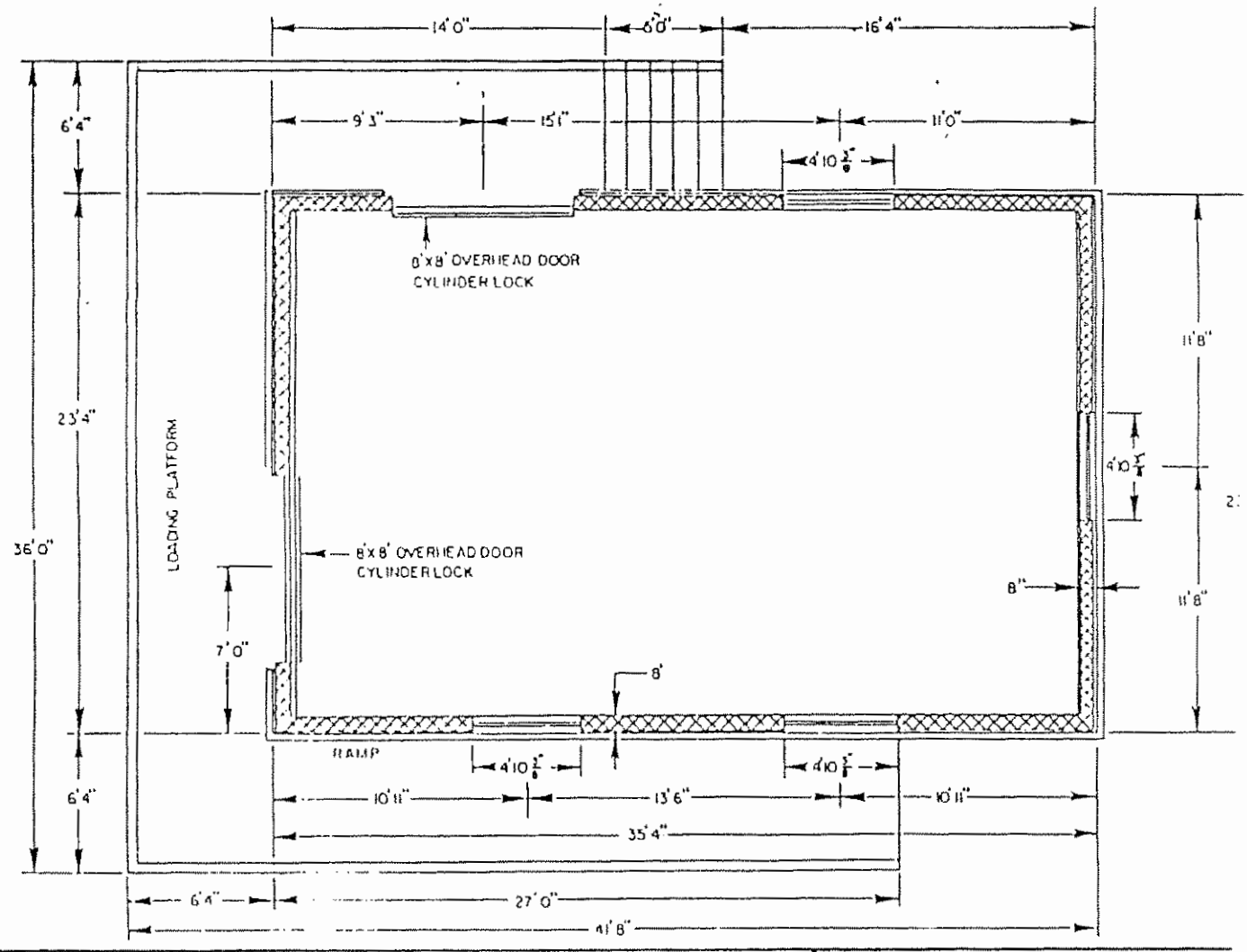

FIGURE C-2.

PLAN VIEW OF TRANSFORMER STORAGE AREA

SENECA ARMY DEPOT
ROMULUS, NY

3. MAP LOCATION/SITE NUMBER. SEAD-3.

a. Unit Name. Incinerator Cooling Water Pond.

b. Unit Characteristics.

(1) Unit Type. Abandoned dry lagoon.

(2) Design Features. Unlined depression approximately 50 feet in diameter and 6- to 10-feet deep.

(3) Approximate Dates of Usage. 1974 to 1979.

(4) Operating Practices. The pond was used to hold the cooling water and fly ash generated from the scrubber on the incinerator. The fly ash was removed every 18 months and put into the ash landfill.

(5) Present Condition and Status. Abandoned, dry.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Cooling water and fly ash from the incinerator.

(2) Physical and Chemical Characteristics. Heavy metals and sulfate are the primary constituents of concern.

(3) Migration and Dispersal Characteristics. Dissolved metals and sulfate may migrate to the ground water.

(4) Toxicological Characteristics. Drinking water standards are available for many of the heavy metals, and an aesthetic drinking water criterion is available for sulfate.

d. Migration Pathways. Soil, ground water.

e. Evidence of Release. Elevated sulfate concentrations in ground-water monitoring well samples. The abandoned pond is in the same area as the old refuse burning pits and the ash landfill, both of which may be the source of the ground-water contamination.

f. Exposure Potential. Ground-water contamination has been confirmed in the area, but because the source is probably not the abandoned pond, the exposure potential is rated as low.

g. Recommendation. Same as Ash Landfill (SEAD-6).

h. References. 9, 23.

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4. MAP LOCATION/SITE NUMBER. SEAD-4.

a. Unit Name. Munitions Washout Facility Leach Field.

b. Unit Characteristics.

(1) Unit Type. Leach field.

(2) Design Features. Unknown.

(3) Approximate Dates of Usage. 1948 to 1963.

(4) Operating Practices. Obsolete and defective munitions were dismantled and washed out. The wastewater was presumedly treated in some manner to concentrate and solidify most of the explosive compounds which were later burned at the demolition grounds. The remaining water discharged into an area near Bldg 2084 and either leached into the ground or flowed into a nearby ditch.

(5) Present Condition and Status. The foundation of the dismantled washout plant is still visible, but no evidence of the leach field can be found.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Wastewater potentially contaminated with small amounts of explosives.

(2) Physical and Chemical Characteristics. Compounds which presumably could be found include 2,4,6-TNT, 2,4-DNT, 2,6-DNT, RDX, HMX, trinitrobenzene and tetryl. Heavy metals are also potential contaminants of the waste.

(3) Migration and Dispersal Characteristics. The wastewater containing the explosives and heavy metals would leach into the ground relatively easily.

(4) Toxicological Characteristics. Army-suggested drinking water limits are available for 2,4,6-TNT and for RDX. The explosive compound 2,4-DNT is a suspected carcinogen. Drinking water limits are available for many of the heavy metals.

d. Migration Pathways. Soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. Soil samples and ground-water monitoring wells.

h. References. 9, 10.

5. MAP LOCATION/SITE NUMBER. SEAD-5.

a. Unit Name. Sewage Sludge Waste Pile.

b. Unit Characteristics.

(1) Unit Type. Waste Pile.

(2) General Dimensions. Approximately 40 feet long, 20 feet wide, and 10 feet high.

(3) Approximate Dates of Usage. 1980 to present.

(4) Operating Practices. Sludge is removed periodically from the sludge drying beds at the two sewage treatment plants and is stored in the waste pile until a permit is acquired to apply the sludge to the land for growing grassy areas for pheasant nesting.

(5) Present Condition and Status. Part of the waste pile is covered with pieces of plastic, but most of the pile is covered with a heavy growth of vegetation (grass, tomato plants, vines).

c. Waste Characteristics.

(1) Specific Wastes Disposed. Sewage sludge from the sludge drying beds at STP No. 4 and STP No. 715.

(2) Physical and Chemical Characteristics. The sludge was tested by the State and by a lab under contract to SEAD in 1985, and was high in copper.

(3) Migration and Dispersal Characteristics. Precipitation flowing through the waste pile could leach heavy metals (copper) and nitrates from the sludge.

(4) Toxicological Characteristics. Copper has not been determined to be toxic, but an aesthetic drinking water criterion is available. A drinking water standard has been established for nitrates.

d. Migration Pathways. Soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Very low.

g. Recommendations for Sampling. None.

6. MAP LOCATION/SITE NUMBER. SEAD-6.

a. Unit Name. Abandoned Ash Landfill.

b. Unit Characteristics.

(1) Unit Type. Area landfill.

(2) General Dimensions. 600 feet by 300 feet (approximately 4 acres).

(3) Approximate Dates of Usage. 1941 until the late 1950's or early 1960's; again after the incinerator was built, 1974 to 1979.

(4) Operating Practices. Ash from the refuse burning pits was buried in the landfill from 1941 until the late 1950's or early 1960's. The Varick dump was used for a period of time until the incinerator was constructed. When the incinerator was built, ash was again disposed in the same area previously used. The refuse was dumped in piles and occasionally spread and compacted. No daily or final cover was applied. It was often subject to ponding from seasonally high surface and ground water.

(5) Present Condition and Status. Abandoned. The area is covered with vegetation (grasses, vines, low shrubs).

c. Waste Characteristics.

(1) Specific Wastes Disposed. Ash from the refuse burning pits and the incinerator.

(2) Physical and Chemical Characteristics. Because almost any types of wastes were burned in the refuse burning pits and in the incinerator, the ash could have contained any variety of compounds and constituents. Heavy metals would probably be of greatest concern. Volatile organic compounds would probably have been destroyed during the combustion process.

(3) Migration and Dispersal Characteristics. Heavy metals are soluble in water but are also adsorbed by the clays which are predominant in the landfill area.

(4) Toxicological Characteristics. Drinking water standards are available for the heavy metals.

d. Migration Pathways. Ground water.

e. Evidence of Release. Table C-1 lists the ground-water level and quality data available for the original five monitoring wells around the landfill. Ground-water samples from wells PT-12 and PT-14 collected in March 1987.

were contaminated with trichloroethylene and 1,2-dichloroethylene. Subsequent samples collected from additional wells installed during this Agency's October 1987 study contained high concentrations of trichloroethylene and trans-1,2-dichloroethylene, and lesser amounts of chloroform, 1,2-dichloroethane, and vinyl chloride. The contamination is probably not due to the ash landfill contents but is more likely due to the refuse burning pits.

f. Exposure Potential. High. Three offpost private wells are located less than a quarter mile downgradient from the contaminated monitoring wells. Samples collected from those wells in August 1987 did not contain volatile organic compounds above a detection limit of 5 micrograms per liter (µg/L).

g. Recommendation. Investigate the extent of the contamination plume offpost.

h. References. 6, 8, 14, 22, 23.

TABLE C-1

SAMPLING SITES RESULTS

TABLE C-1. Sampling Sites Results

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD. NY

SITE: LANDFILL

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B PT-10	PT-11	PT-12	PT-13	PT-14	PT-15
WATER									
LEVELS (A)	14 DEC 81		FT	675.3	654.1	646.3	634.3	633.7	628.3
LEVELS (A)	29 MAR 82		FT	676.4	653.8	646.3	634.2	635.0	632.9
LEVELS (A)	21 JUN 82		FT	672.3	653.0	645.8	633.5	633.0	631.0
LEVELS (A)	20 SEP 82		FT	670.4	650.6	643.3	630.8	631.2	627.8
LEVELS (A)	15 FEB 83		FT	673.3	653.3	646.8	633.8	634.8	634.1
LEVELS (A)	08 AUG 83		FT	670.5		642.5	630.9	630.3	
LEVELS (A)	14 FEB 84		FT	675.9	651.0	647.9	634.1	634.9	632.8
LEVELS (A)	17 SEP 84		FT	674.4	654.4	648.7		634.3	629.9
LEVELS (A)	19 MAR 85		FT	676.6	652.1	647.1		635.4	633.7
LEVELS (A)	12 SEP 85		FT	670.0	652.3	642.0		630.1	630.6
LEVELS (A)	17 MAR 86		FT	675.5	653.9	644.9			634.2
LEVELS (A)	16 SEP 86		FT	675.4	653.9	646.0			631.2
LEVELS (A)	16 MAR 87		FT	675.1	653.2	647.5		635.5	633.0

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B PT-10	PT-11	PT-12	PT-13	PT-14	PT-15
ARSENIC	16 SEP 86	.010	MGL	ND	ND	ND			ND
ARSENIC	17 MAR 87	.005	MGL	ND	ND	ND		ND	ND
BARIUM	16 SEP 86	.30	MGL	ND	ND	ND			ND
BARIUM	17 MAR 87	.05	MGL	.22	.08	.03		.06	.08
CADMIUM	16 SEP 86	1.000	UGL	ND	ND	1.110*			ND
CADMIUM	17 MAR 87	.001	MGL	ND	ND	ND		ND	ND
CHROMIUM	16 SEP 86	.010	MGL	ND	ND	ND			ND
CHROMIUM	17 MAR 87	.020	MGL	ND	ND	ND		ND	ND
LEAD	16 SEP 86	.005	MGL	ND	ND	.013			ND
LEAD	17 MAR 87	.005	MGL	.055&	.027&	.031&		.023	.038&
MERCURY	16 SEP 86	.2	UGL	ND	ND	.3			ND
SELENIUM	16 SEP 86	.005	MGL	ND	ND	ND			ND
SELENIUM	17 MAR 87	.001	MGL	.001	ND	ND		ND	ND
SILVER	16 SEP 86	.025	MGL	ND	ND	ND			ND
SILVER	17 MAR 87	.020	MGL	ND	ND	ND		ND	ND
CHLORIDE	15 DEC 81	1.0	MGL	80.8	91.3	93.0	7.0	73.0	8.8
CHLORIDE	30 MAR 82	1.0	MGL	77.0	68.3	61.0	11.0	93.0	11.0
CHLORIDE	22 JUN 82	1.0	MGL	76.0	61.0	360.08	5.0	86.0	5.0
CHLORIDE	20 SEP 82	1.0	MGL	78.0	68.0	1110.08	7.0	95.0	15.0
CHLORIDE	15 FEB 83	1.0	MGL	70.0	69.0	30.0	8.0	79.0	15.0
CHLORIDE	09 AUG 83	1.0	MGL	72.0		1510.08	9.0	66.0	
CHLORIDE	14 FEB 84	1.0	MGL	74.0	55.0	41.0	5.0	61.0	7.7
CHLORIDE	18 SEP 84	1.0	MGL	51.0	57.0	24.0		42.0	6.0
CHLORIDE	20 MAR 85	1.0	MGL	69.0	57.0	16.0		23.0	7.0
CHLORIDE	13 SEP 85	1.0	MGL	69.0	52.0	692.08		46.0	13.0
CHLORIDE	18 MAR 86	1.0	MGL	34.0	57.0	14.0			10.0
CHLORIDE	16 SEP 86	1.0	MGL	62.0	58.0	305.08			9.0
CHLORIDE	17 MAR 87	1.0	MGL	70.0	60.0	43.0		16.0	3.0
IRON	15 DEC 81	.03	MGL	ND	ND	ND	ND	ND	.15
IRON	30 MAR 82	.02	MGL	.05	.05	.06	.06	.03	.20
IRON	22 JUN 82	.03	MGL	ND	.11	.06	.01	.06	.08
IRON	20 SEP 82	.03	MGL	ND	ND	ND	ND	ND	ND
IRON	15 FEB 83	.03	MGL	ND	.07	ND	.05	.09	.16
IRON	09 AUG 83	.02	MGL	.24		.05	.10	.07	
IRON	14 FEB 84	.10	MGL	ND	ND	ND	ND	.24	.11
IRON	18 SEP 84	.10	MGL	.20	.11	ND		.35#	.24
IRON	20 MAR 85	.10	MGL	ND	ND	ND		ND	ND
IRON	13 SEP 85	.10	MGL	ND	ND	ND		ND	ND
IRON	18 MAR 86	.10	MGL	ND	ND	ND			ND
IRON	16 SEP 86	.10	MGL	ND	ND	ND			ND
IRON	17 MAR 87	.10	MGL	ND	ND	ND		ND	ND

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS					
				PT-10	PT-11	PT-12	PT-13	PT-14	PT-15
SODIUM	16 SEP 86	1	MG/L	49	56	56.			31.
SODIUM	17 MAR 87	1	MG/L	49	57	43		18.	32.
SULFATE	15 DEC 81	2.0	MG/L	17.8	152.0	622.0%	41.6	100.0	42.7
SULFATE	30 MAR 82	2.0	MG/L	29.0	131.1	360.0%	46.0	100.0	40.0
SULFATE	22 JUN 82	2.0	MG/L	35.0	120.0	490.0%	35.0	100.0	31.0
SULFATE	20 SEP 82	2.0	MG/L	29.0	110.0	480.0%	40.0	110.0	55.0
SULFATE	15 FEB 83	2.0	MG/L	22.0	140.0	200.0	41.0	110.0	46.0
SULFATE	09 AUG 83	2.0	MG/L	30.0		481.0%	70.0	21.0	
SULFATE	14 FEB 84	2.0	MG/L	20.0	5.0	392.0%	39.0	105.0	40.0
SULFATE	18 SEP 84	2.0	MG/L	16.0	37.0	36.0		34.0	29.0
SULFATE	20 MAR 85	2.0	MG/L	19.0	161.0	275.0%		64.0	37.0
SULFATE	17 SEP 85	2.0	MG/L	13.0	134.0	487.0%		97.0	44.0
SULFATE	19 MAR 86	2.0	MG/L	28.0	152.0	211.0			58.0
SULFATE	16 SEP 86	2.0	MG/L	28.0	150.0	404.0%			42.0
SULFATE	17 MAR 87	2.0	MG/L	19.0	120.0	50.0		44.0	18.0
CONDUCTIELD)	20 MAR 85	1	UMHO	580	700	800.		490.	350.
CONDUCTIELD)	18 MAR 86	1	UMHO	620	690	610.			390.
CONDUCTIELD)	17 MAR 87	1	UMHO	545	690	1030.		445	330.
PHFIELD)	15 DE 81		PH	7.6	7.3	7.1	7.2	7.3	7.6
PHFIELD)	30 MAR 82		PH	7.3	7.8	7.3	7.3	7.4	7.9
PHFIELD)	22 JUN 82		PH	7.5	7.6	7.1	7.3	7.4	7.7
PHFIELD)	20 SEP 82		PH	7.5	7.6	7.2	7.2	7.4	7.8
PHFIELD)	15 FEB 83		PH	7.4	7.6	7.5	7.5	7.5	7.8
PHFIELD)	09 AUG 83		PH	7.1		6.3*	6.8	6.6	
PHFIELD)	09 AUG 83		PH	7.3		6.3*	6.8	6.6	
PHFIELD)	09 AUG 83		PH	7.1		6.3*	6.8	6.6	
PHFIELD)	09 AUG 83		PH	7.1		6.3*	6.8	6.6	
PHFIELD)	14 FEB 84		PH	7.1	7.5	7.1	7.1	7.5	7.6
PHFIELD)	18 SEP 84		PH	7.4	7.7	7.4		7.2	7.7
PHFIELD)	18 SEP 84		PH	7.5	7.6	7.3		7.3	7.7
PHFIELD)	18 SEP 84		PH	7.6	7.6	7.4		7.2	7.6
PHFIELD)	18 SEP 84		PH	7.5	7.6	7.1		7.2	7.7
PHFIELD)	20 MAR 85		PH	7.2	6.9	6.9		7.0	7.1
PHFIELD)	17 SEP 85		PH	7.4	7.3	6.9		7.1	7.4
PHFIELD)	19 MAR 86		PH	6.4	7.0	7.0			7.3
PHFIELD)	16 SEP 86		PH	7.4	7.2	6.			7.4
PHFIELD)	17 MAR 87		PH	7.3	7.2	6.		6.8	7.1
PHFIELD)	15 DEC 81		PH	7.1	7.1	7.1		7.1	7.6
PHFIELD)	1 MAR 82		PH	7.2	7.5	7.2	7	7.1	7.4
PHFIELD)	22 JUN 82		PH	7.4	7.4	7.1		7.0	7.4
PHFIELD)	20 SEP 82		PH	7.4	7.4	7.1		7.1	7.4

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT		UNITS	B PT-10	PT-11	PT-12	PT-13	PT-14	PT-15
PH(LAB)	15 FEB 83			PH	7.3	7.0	6.7	6.8	6.8	7.1
PH(LAB)	09 AUG 83			PH	7.1		6.7	7.5	7.2	
PH(LAB)	14 FEB 84			PH	7.8	8.0	7.7	7.8	7.8	8.2
PH(LAB)	18 SEP 84			PH	7.7	7.7	7.3		7.6	7.8
PH(LAB)	13 SEP 85			PH	7.9	7.8	7.4		7.6	8.0
PH(LAB)	18 MAR 86			PH	7.8	7.7	7.8			7.8
PH(LAB)	17 MAR 87			PH	6.9	6.9	6.7		6.9	7.2
SPEC COND	15 DEC 81		1	UMC	890.	1050.	1710.	610.	900.	510.
SPEC COND	15 DEC 81		1	UMC	880.	1050.	1710.	610.	900.	510.
SPEC COND	15 DEC 81		1	UMC	890.	1050.	1710.	610.	900.	510.
SPEC COND	15 DEC 81		1	UMC	890.	1050.	1710.	600.	900.	510.
SPEC COND	30 MAR 82		1	UMC	876.	950.	1340.	620.	970.	470.
SPEC COND	30 MAR 82		1	UMC	879.	950.	1339.	625.	965.	470.
SPEC COND	30 MAR 82		1	UMC	878.	949.	1340.	622.	968.	470.
SPEC COND	30 MAR 82		1	UMC	874.	950.	1340.	624.	968.	470.
SPEC COND	22 JUN 82		1	UMC	800.	850.	2250.	540.	850.	460.
SPEC COND	22 JUN 82		1	UMC	800.	845.	2250.	540.	850.	455.
SPEC COND	22 JUN 82		1	UMC	800.	845.	2250.	540.	850.	460.
SPEC COND	22 JUN 82		1	UMC	800.	850.	2250.	540.	850.	460.
SPEC COND	20 SEP 82		1	UMC	880.	940.	3900.	560.	1000.	570.
SPEC COND	20 SEP 82		1	UMC	880.	940.	3850.	560.	1000.	570.
SPEC COND	20 SEP 82		1	UMC	880.	940.	3850.	560.	1000.	570.
SPEC COND	20 SEP 82		1	UMC	880	940.	3900.	560.	1000.	570.
SPEC COND	15 FEB 83		1	UMC	845.	925.	1280.	620.	960.	510.
SPEC COND	15 FEB 83		1	UMC	845.	920.	1270	620.	960.	505.
SPEC COND	15 FEB 83		1	UMC	840.	920.	1270.	620.	960.	505.
SPEC COND	15 FEB 83		1	UMC	845.	920.	1275.	620.	960.	510.
SPEC COND	09 AUG 83		1	UMC	960		5800.	670.	990.	
SPEC COND	09 AUG 83		1	UMC	960		5800.	670	990.	
SPEC COND	09 AUG 83		1	UMC	960.		5800.	670.	990.	
SPEC COND	09 AUG 83		1	UMC	970		5700.	670.	990.	
SPEC COND	14 FEB 84		1	UMC	670	780	900.	480.	720.	420.
SPEC COND	14 FEB 84		1	UMC	680.	780.	900	470.	720.	420.
SPEC COND	14 FEB 84		1	UMC	690.	780.	900.	470.	720.	420.
SPEC COND	14 FEB 84		1	UMC	660	780.	900.	480.	720.	420.
SPEC COND	18 SEP 84		1	UMC	730	850	890		740.	740.
SPEC COND	18 SEP 84		1	UMC	740	860	900.		730.	740.
SPEC COND	18 SEP 84		1	UMC	740	860	890		740.	740.
SPEC COND	18 SEP 84		1	UMC	740	860	900		740.	740.
SPEC COND	20 MAR 85		1	UMC	960	860	1110		660.	460.
SPEC COND	20 MAR 85		1	UMC	950	800	1100		660.	460.

C-14

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B PT 10	PT 11	PT 12	PT 13	PT 14	PT 15
SPEC COND	20 MAR 85	1	UMC	950	810	1120.		660.	450
SPEC COND	20 MAR 85	1	UMC	960	800	1110.		660	460.
SPEC COND	13 SEP 85	1	UMC	820	840	3800		700.	510.
SPEC COND	13 SEP 85	1	UMC	830	840	3850		690.	530.
SPEC COND	13 SEP 85	1	UMC	830	830	3800		700.	520
SPEC COND	13 SEP 85	1	UMC	840	840	3800		700.	520
SPEC COND	18 MAR 86	1	UMC	750	990	940			500.
SPEC COND	18 MAR 86	1	UMC	750	1000	940			490.
SPEC COND	18 MAR 86	1	UMC	750	990	940			500.
SPEC COND	18 MAR 86	1	UMC	750	990	930			500.
SPEC COND	16 SEP 86	1	UMC	850	1020	2300			540.
SPEC COND	16 SEP 86	1	UMC	850	1010	2250			540
SPEC COND	16 SEP 86	1	UMC	850	1010	2300			540.
SPEC COND	16 SEP 86	1	UMC	850	1020.	2300			540.
SPEC COND	17 MAR 87	1	UMC	810	1000	1000		650.	490.
SPEC COND	17 MAR 87	1	UMC	810	1000	1000.		640	500.
SPEC COND	17 MAR 87	1	UMC	810	1100	1000		640	500.
SPEC COND	17 MAR 87	1	UMC	850	1100	1000		650	490.
TOC	15 DEC 81	1	MG/L	2.0	3.0	3.0	1.0	3.0	2.0
TOC	15 DEC 81	1	MG/L	1.0	1.0	3.0	1.0	3.0	2.0
TOC	15 DEC 81	1	MG/L	2.0	3.0	3.0	1.0	3.0	2.0
TOC	15 DEC 81	1	MG/L	1.0	3.0	3.0	2.0	3.0	2.0
TOC	30 MAR 82	1	MG/L	2.0	1.0	4.0	2.0	3.0	2.0
TOC	30 MAR 82	1	MG/L	2.0	4.0	4.0	2.0	3.0	2.0
TOC	30 MAR 82	1	MG/L	2.0	4.0	4.0	2.0	3.0	2.0
TOC	30 MAR 82	1	MG/L	2.0	4.0	4.0	2.0	3.0	2.0
TOC	22 JUN 82	1	MG/L	63.0	55.0	67.0	62.0	58.0	42.0
TOC	22 JUN 82	1	MG/L	62.0	54.0	67.0	61.0	58.0	42.0
TOC	22 JUN 82	1	MG/L	61.0	55.0	67.0	60.0	58.0	42.0
TOC	22 JUN 82	1	MG/L	62.0	55.0	67.0	60.0	58.0	42.0
TOC	20 SEP 82	1	MG/L	53.0	45.0	47.0	39.0	40.0	27.0
TOC	20 SEP 82	1	MG/L	54.0	47.0	49.0	39.0	42.0	27.0
TOC	20 SEP 82	1	MG/L	52.0	47.0	48.0	39.0	41.0	27.0
TOC	20 SEP 82	1	MG/L	52.0	45.0	50.0	38.0	42.0	26.0
TOC	15 FEB 83	1	MG/L	14.0	12.0	14.0	11.0	11.0	7.0
TOC	15 FEB 83	1	MG/L	13.0	11.0	13.0	11.0	11.0	6.0
TOC	15 FEB 83	1	MG/L	14.0	12.0	13.0	10.0	11.0	7.0
TOC	15 FEB 83	1	MG/L	13.0	12.0	13.0	10.0	11.0	7.0
TOC	17 AUG 87	1	MG/L	57.0		59.0	14.0	19.0	
TOC	17 AUG 87	1	MG/L	57.0		58.0	15.0	43.0	
TOC	17 AUG 87	1	MG/L	57.0		54.0	16.0	38.0	

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B PT-10	PT-11	PT-12	PT-13	PT-14	PT-15
TOC	09 AUG 83	1	MGL	60.0		60.0	35.0	50.0	
TOC	14 FEB 84	1	MGL	42.0	38.0	32.0	30.0	29.0	23.0
TOC	14 FEB 84	1	MGL	43.0	37.0	31.0	29.0	29.0	23.0
TOC	14 FEB 84	1	MGL	43.0	38.0	31.0	29.0	29.0	23.0
TOC	14 FEB 84	1	MGL	42.0	38.0	31.0	29.0	28.0	22.0
TOC	18 SEP 84	1	MGL	3.0	4.0	5.0		5.0	2.0
TOC	18 SEP 84	1	MGL	4.0	4.0	5.0		3.0	2.0
TOC	18 SEP 84	1	MGL	3.0	5.0	4.0		4.0	2.0
TOC	18 SEP 84	1	MGL	3.0	3.0	4.0		3.0	2.0
TOC	20 MAR 85	1	MGL	3.0	6.5	7.2		3.9	5.1
TOC	20 MAR 85	1	MGL	3.0	6.5	7.2		4.0	5.3
TOC	20 MAR 85	1	MGL	3.0	6.5	7.2		4.1	5.3
TOC	20 MAR 85	1	MGL	3.1	6.5	7.2		4.0	5.2
TOC	13 SEP 85	1	MGL	1.3	2.7	3.5		3.2	1.8
TOC	13 SEP 85	1	MGL	1.2	2.5	3.4		3.3	1.8
TOC	13 SEP 85	1	MGL	1.4	2.6	3.5		3.3	1.9
TOC	13 SEP 85	1	MGL	1.3	2.6	3.4		3.3	1.9
TOC	18 MAR 86	1	MGL	1.6	2.8	3.2			1.5
TOC	18 MAR 86	1	MGL	1.6	2.8	3.0			1.5
TOC	18 MAR 86	1	MGL	1.6	2.8	3.0			1.5
TOC	18 MAR 86	1	MGL	1.6	2.8	3.1			1.4
TOC	16 SEP 86	1	MGL	4.5	5.6	5.8			3.3
TOC	16 SEP 86	1	MGL	4.5	5.7	5.7			3.3
TOC	16 SEP 86	1	MGL	4.6	5.7	5.7			3.3
TOC	16 SEP 86	1	MGL	4.5	5.8	5.9			3.2
TOC	17 MAR 87	1	MGL	2.8	5.1	3.9		5.0	2.2
TOC	17 MAR 87	1	MGL	3.0	5.0	3.9		4.9	2.3
TOC	17 MAR 87	1	MGL	2.9	5.0	3.6		5.0	2.4
TOC	17 MAR 87	1	MGL	2.9	5.0	3.8		4.8	2.2
TOX	16 SEP 86	.010	MGL	ND	ND	1.140			ND
TOX	16 SEP 86	.010	MGL	ND	ND	1.087			ND
TOX	16 SEP 86	.010	MGL	ND	ND	.981			ND
TOX	16 SEP 86	.010	MGL	ND	ND	1.053			ND
TOX	17 MAR 87	.010	MGL	ND	.020	.748		.186	ND
TOX	17 MAR 87	.010	MGL	ND	.021	.738		.198	ND
TOX	17 MAR 87	.010	MGL	ND	.028	.745		.183	ND
TOX	17 MAR 87	.010	MGL	ND	.018	.664		.182	ND
NITRATE-N	17 MAR 87	.01	MGL	22	42	10		38	37
POTASSIUM	16 SEP 86	1	MGL	2.94	2.63	3.52			2.29
POTASSIUM	17 MAR 87	1	MGL	2.46	2.17	2.33		3.39	1.94

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY SITE: LANDFILL

LEGEND
NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.
B UPGRADIENT SITE
* VALUE EXCEEDS A NATIONAL INTERIM PRIMARY DRINKING WATER REGULATION STANDARD
# VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA
& VALUE EXCEEDS A STATE WATER QUALITY STANDARD OR CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

7. MAP LOCATION/SITE NUMBER. SEAD-7.

a. Unit Name. Shale Pit.

b. Unit Characteristics.

(1) Unit Type. Fill area.

(2) General Dimensions. Approximately 1 acre.

(3) Approximate Dates of Usage. 1987 to present.

(4) Operating Practices. Construction debris is dumped into the pit. No cover is applied.

(5) Present Condition and Status. Very little construction debris had been placed in the pit as of the site visit.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Construction and demolition wastes such as concrete, asphalt, some wood.

(2) Physical and Chemical Characteristics. The wastes disposed in the pit are relatively inert and do not contain chemicals which would cause contamination.

d. Migration Pathways. Ground water, surface water.

e. Evidence of Release. None observed.

f. Exposure Potential. Very low.

g. Recommendations for Sampling. None.

8. MAP LOCATION/SITE NUMBER. SEAD-8.

a. Unit Name. Noncombustible Fill Area.

b. Unit Characteristics.

(1) Unit Type. Area landfill.

(2) General Dimensions. 350 feet by 350 feet, approximately 3 acres.

(3) Approximate Dates of Usage. 1974 to 1979.

(4) Operating Practices. Items which were too bulky, or noncombustible were buried instead of being incinerated or burned.

(5) Present Condition and Status. Closed. The area is vegetated with grasses, vines, and shrubs.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Bulky and noncombustible wastes which could not be burned or incinerated. Some construction debris was also buried.

(2) Physical and Chemical Characteristics. Unknown. Heavy metals are the most likely constituents of concern.

(3) Migration and Dispersal Characteristics. Heavy metals are soluble in water but are also adsorbed by clays which are predominant in the landfill area.

(4) Toxicological Characteristics. Drinking water standards are available for the heavy metals.

d Migration Pathways. Ground water.

e. Evidence of Release. None

f. Exposure Potential. Moderate due to uncertainty of contents.

g. Recommendations for Sampling. Continue sampling well PI-11 for the State-required parameters.

h. References. 9, 14.

9. MAP LOCATION/SITE NUMBER. SEAD-9.

a. Unit Name. Old Scrap Wood Pile.

b. Unit Characteristics.

(1) Unit Type. Construction debris area landfill.

(2) General Dimensions. Approximately 1 acre.

(3) Approximate Dates of Usage. Scrap wood from 1984 to 1986, construction debris from 1977 to 1984.

(4) Operating Practices. Construction and demolition wastes were deposited and occasionally compacted. The site was also used to store scrap wood which depot employees could take. Periodically, the fire department had training exercises using the woodpile as fuel.

(5) Present Condition and Status. Inactive. The area had been smoothed, but there was no vegetation growing yet.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Construction and demolition wastes including concrete, wood, and asphalt.

(2) Physical and Chemical Characteristics. In general, the wastes disposed were chemically inert.

d. Migration Pathways. Ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Very low.

g. Recommendations for Sampling. None.

h. References. 9.

10. MAP LOCATION/SITE NUMBER. SEAD-10.

a. Unit Name. Present Scrap Wood Pile.

b. Unit Characteristics.

(1) Unit Type. Scrap wood disposal site.

(2) General Dimensions. Approximately 50 feet in diameter.

(3) Approximate Dates of Usage. 1986 to present.

(4) Operating Practices. Scrap wood from various depot activities is dumped in a pile and may be removed by depot employees. Periodically, the fire department holds a training exercise using the scrap wood pile as fuel. The State is notified prior to any burning.

(5) Present Condition and Status. Active.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Scrap wood from depot activities. At the time of the site visit, most of the waste wood consisted of electrical wire spools, packing crates, and wooden construction debris.

(2) Physical and Chemical Characteristics. The waste is generally chemically inert.

(3) Migration and Dispersal Characteristics. Little to no migration is expected to occur from the woodpile as long as no treated wood products are disposed. Occasional releases to the air occur.

d. Migration Pathways. Air, soil.

e. Evidence of Release. Periodic releases to the air.

f. Exposure Potential. Very low.

g. Recommendations for Sampling. None.

11. MAP LOCATION/SITE NUMBER. SEAD-11.

a. Unit Name. Old Construction Debris Landfill.

b. Unit Characteristics.

(1) Unit Type. Area fill.

(2) General Dimensions. Estimated at 2 acres.

(3) Approximate Oates of Usage. 1946 to 1949.

(4) Operating Practices. Unknown.

(5) Present Condition and Status. Abandoned. Area is vegetated with grasses and weeds.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Construction debris.

(2) Physical and Chemical Characteristics. Unknown.

d. Migration Pathways. Ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. Ground-water monitoring wells.

12. MAP LOCATION/SITE NUMBER. SEAD-12.

a. Unit Name. Radioactive Waste Burial Sites.

b. Unit Characteristics.

(1) Unit Type. Burial pits.

(2) General Dimensions. Three sites, sizes unknown.

(3) Approximate Dates of Usage. Pre-1962.

(4) Operating Practices. Radioactive wastes were supposedly buried in three small pits in the Limited Area.

(5) Present Condition and Status. The sites were excavated in 1986, and the waste was sent to an authorized offpost radioactive waste landfill.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Radioactive and nonradioactive wastes from the clinic (gloves, etc.) and classified metal parts.

(2) Migration and Dispersal Characteristics. Assuming that the waste was contaminated with radioactive particles, ground-water contamination could result from longterm burial of the wastes. Because the radioactive sites were excavated and the wastes were removed to a radioactive waste site offpost, there is a low potential for continuing release.

d. Migration Pathways. Ground water, soil.

e. Evidence of Release. None.

f. Exposure Potential. Low.

g. Recommendations for Sampling. None.

h. References. 9, 10.

13. MAP LOCATION/SITE NUMBER. SEAD-13.

a. Unit Name. IRFNA Disposal Site.

b. Unit Characteristics.

(1) Unit Type. Limestone-lined neutralization pits.

(2) Design Features. Six pits 8-feet by 30-feet by 4-feet deep. Five of the pits were used for acid dumping. The pits were formed using a bulldozer to scrape down to a shale stratum 4 feet below grade. Limestone was placed in the pits to a depth of approximately 2 and 1/2 feet, and the sides were also covered with limestone.

(3) Approximate Dates of Usage. Late 1950's to the early 1960's.

(4) Operating Practices. Barrels (18.8 gallon capacity) of unserviceable IRFNA were stored on pallets near the west end of the pits. A stainless steel ejector operated with water pressure was fitted into a barrel with water flowing through the ejector. The ejector discharged a mixture of water and IRFNA through a long polyethylene hose under the water surface in the pit being used. Five minutes were required to empty a barrel, and 10 barrels were usually discharged into a single pit during a day's operation.

(5) Present Condition and Status. Abandoned. Unable to locate because under the Duck Ponds.

c. Waste Characteristics.

(1) Specific Wastes Disposed. IRFNA, an oxidizer used in missile liquid propellant systems.

(2) Physical and Chemical Characteristics. Composition is 81.3-84.5-percent nitric acid (HNO_3), 13-15-percent nitrogen dioxide (NO_2), 0.5-0.7-percent hydrofluoric acid (HF), and 2.0-3.0-percent water.

(3) Migration and Dispersal Characteristics. After neutralization of the IRFNA, the primary constituents of concern would be nitrates, nitrites, and fluoride, all of which could migrate in the ground water.

(4) Toxicological Characteristics. Drinking water limits are available for nitrates and fluoride.

d. Migration Pathways. Ground water, surface water (if covered by the Duck Ponds).

e. Evidence of Release. None observed.

f. Exposure Potential. Low.

g. Recommendations for Sampling. None.

h. References. 5, 9, 10.

14. MAP LOCATION/SITE NUMBER. SEAD-14.

a. Unit Name. Refuse Burning Pits.

b. Unit Characteristics.

(1) Unit Type. Solid waste burning pits.

(2) General Dimensions. Two pits, 40 feet by 80 feet each.

(3) Approximate Dates of Usage. 1941 to 1974.

(4) Operating Practices. Refuse was dumped into the pits, and burned at least once per week. Metal was removed for recycling, and the ash was pushed into the adjacent ash landfill.

(5) Present Condition and Status. Abandoned. The incinerator replaced the pits in 1974 in the same area.

c. Waste Characteristics.

(1) Specific Wastes Disposed. All wastes generated on the depot including domestic wastes from the housing area, wastes from the administrative area, and oils and solvent sludges from the shops.

(2) Physical and Chemical Characteristics. Heavy metals, oils, and solvents are the primary constituents of concern.

(3) Migration and Dispersal Characteristics. Of the three constituents of concern, the solvent compounds are the most mobile in the ground-water environment. The oil breakdown products and the heavy metals may also migrate, but probably at a slower rate due to the clays in the area.

(4) Toxicological Characteristics. Drinking water standards and recommended maximum contaminant levels are available for many of the constituents of concern.

d. Migration Pathways. Ground water.

e. Evidence of Release. Same as ash landfill (SEAD-6).

f. Exposure Potential. Very high.

g. Recommendation. Same as ash landfill (SEAD-6).

h. References. 6, 9, 14, 23.

15. MAP LOCATION/SITE NUMBER. SEAD-15.

a. Unit Name. Bldg 2207 - Abandoned Solid Waste Incinerator.

b. Unit Characteristics.

(1) Unit Type. Solid waste incinerator.

(2) Design Features. The incinerator was a multiple chamber, batch-fed 2,000 lb/hr capacity unit designed to burn a mixture of rubbish and garbage. Features on the unit included an automatic ram-type feeder, a refractory-lined furnace with secondary combustion and settling chamber, a reciprocating stoker, a residue conveyor for ash removal, combustion air fans, a wet gas scrubber, an induced draft fan, and a refractory-lined stack.

(3) Approximate Dates of Usage. 1974 to 1979.

(4) Operating Practices. Depot refuse was incinerated once per week. Approximately 18 tons of refuse per week were generated, but some was not incinerated (large items went to the noncombustible fill area). There was a frequent problem with unburned items due to the receipt of wet garbage and bulky items. The operator had to hand-sort the refuse to remove items which would not burn.

(5) Present Condition and Status. Abandoned after being destroyed by fire on 8 May 1979.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Domestic waste from depot activities and family housing. Some small munitions and asbestos were occasionally burned.

d. Migration Pathways. Air.

e. Evidence of Release. Permitted emissions.

f. Exposure Potential. None at present.

g. Recommendations for Sampling. None.

h. References. 6, 8, 9, 10, 16, 22.

Interim Final Rpt, Ground-Water Contamination Surv No. 38-26-0868-88, 27-31 Jul 87

16. MAP LOCATION/SITE NUMBER. SEAD-16.

a. Unit Name. Bldg S-311 - Abandoned Deactivation Furnace.

b. Unit Characteristics.

(1) Unit Type. Munitions deactivation furnace.

(2) Design Features. Unknown.

(3) Approximate Dates of Usage. 1945 to the mid-1960's.

(4) Operating Practices. Small arms munitions were destroyed by incineration. No air pollution or dust collection devices were installed.

(5) Present Condition and Status. Abandoned. The furnace area was flooded with rainwater entering from the lower ramp door.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Obsolete and unserviceable small arms munitions.

(2) Physical and Chemical Characteristics. Explosives and heavy metals (primarily lead).

(3) Migration and Dispersal Characteristics. The explosives should have been completely destroyed in the furnace. Heavy metals probably exited in the ash and dust.

d. Migration Pathways. Air, soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Moderate

g. Recommendations for Sampling. Soils samples. Sample the standing water in the furnace area.

h. References. 9, 10.

Interim Final Rpt, Ground-Water Contamination Surv No. 38-26-0868-88, 27-31 Jul 87

17. MAP LOCATION/SITE NUMBER. SEAD-17.

a. Unit Name. Bldg 367 - Present Deactivation Furnace.

b. Unit Characteristics.

(1) Unit Type. Munitions deactivation furnace.

(2) Design Features. Rotating kiln incinerator with a cyclone and a baghouse for air pollution control.

(3) Approximate Dates of Usage. 1962 to present. Dust collection system added in 1978.

(4) Operating Practices. Unpacked ammunition is placed on an endless conveyor for transfer to the deactivation furnace at prescribed intervals. The ammunition is burned and exploded by the heat in the furnace. The residue from the furnace is transferred by endless conveyor to metal containers and allowed to cool. When cooled, the scrap metal is placed in wooden boxes for transfer to the DRMO.

(5) Present Condition and Status. The process control system was recently upgraded, but the furnace is presently down awaiting a trial burn to be conducted by Fall of 1988. The site is included in the Part B permit application.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Obsolete and unserviceable small arms munitions (20 mm or less in size), fuzes, boosters, firing devices.

(2) Physical and Chemical Characteristics. Explosives and heavy metals (primarily lead).

(3) Migration and Dispersal Characteristics. The explosives should be completely destroyed in the furnace. Heavy metals probably exit in the ash and in the dust.

d. Migration Pathways. Air, soil, ground water.

e. Evidence of Release. Permitted air emissions for particulates (0.05 grains per square foot), carbon monoxide (183 lb/hr), and carbon monoxide (730 lb/hr). During an inspection by the EPA in July 1985, SEAD was cited for a violation of opacity limitation (exceeded 20 percent). The SEAD revised the feed rate and altered mix proportions to alleviate the problem. Prior to the upgrade, a small pit below the molten metal exit used to hold rainwater and drained into the ground probably via a pipe. It is possible that heavy metals could have leached from the dust into the water.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. Soil samples. Samples from the stack and the dust collection system will be collected during the trial burn study.

h. References. 9, 10, 12, 16, 20, 22.

Interim Final Rpt, Ground-Water Contamination Surv No. 38-26-0868-88, 27-31 Jul 87

18. MAP LOCATION/SITE NUMBER. SEAD-18 and SEAD-19.

a. Unit Name. Classified Document Incinerators - Bldg 709 and Bldg 801.

b. Unit Characteristics.

(1) Unit Type. Incinerator.

(2) Design Features. Both incinerators are the single chamber, propane-fired Washburn and Granger model S-200. They are rated at 96 lb/hr with normal chargings of 30-40 lb/day of classified documents. Neither of the incinerators are equipped with air pollution control devices.

(3) Approximate Dates of Usage. 1956 to present.

(4) Operating Practices. Classified documents are incinerated as required. The ash is disposed offpost in a sanitary landfill. Before SEAD had a solid waste disposal contract, the ash was buried in the ash landfill.

(5) Present Condition and Status. Operational.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Classified documents and occasional infectious wastes (not within the recent past).

(2) Physical and Chemical Characteristics. Primarily paper with some plastic and possibly glass.

(3) Migration and Dispersal Characteristics. Ash from the paper may disperse through the stack.

d. Migration Pathways. Air.

e. Evidence of Release. Permitted emissions.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. Sample the ash for EP Toxic metals.

h. References. 10, 16, 22.

19. MAP LOCATION/SITE NUMBER. SEAD-20.

a. Unit Name. STP No. 4.

b. Unit Characteristics.

(1) Unit Type. Sewage treatment plant.

(2) Design Features. STP No. 4 was designed for a maximum flow of 250,000 gallons per day. The plant equipment includes a bar screen, a wet well, a dual-chambered Imhoff tank, a covered fast-rate trickling filter with plastic media, a secondary clarifier, and two sludge drying beds (35 feet by 35 feet each). The wetlands are used for tertiary treatment.

(3) Approximate Dates of Usage. 1942 to present.

(4) Operating Practices. Flow is received from the administration area and from the warehouse area and processed through the plant. Sludges are periodically removed and stored in the sewage sludge waste pile.

(5) Present Condition and Status. Operational. A new Imhoff tank and a sludge storage facility are to be constructed in the future, and the sludge bed tiles are to be repaired.

c. Specific Wastes Disposed. Domestic sewage waste from the administration and warehouse areas. Very small industrial discharges enter the system from boiler plant blowdown.

d. Migration Pathways. Surface water, ground water.

e. Evidence of Release. National Pollutant Discharge Elimination System (NPDES) permit violations for suspended and settleable solids. Leaking Imhoff tank.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. None.

h. References. 6, 7, 8, 9, 10, 11, 13, 17, 18, 22.

20. MAP LOCATION/SITE NUMBER. SEAD-21.

a. Unit Name. STP No. 715.

b. Unit Characteristics.

(1) Unit Type. Sewage treatment plant.

(2) Design Features. The design capacity is 300,000 gallons per day. The plant equipment consists of a grinder pump and comminuter, a primary settling chamber, two rotating biological contactors (RBC's), a secondary clarifier, sand filters, sludge holding tank, sludge digestion tank (old Imhoff tank), and two concrete-lined sludge drying beds with gravel and sand floors (40 feet by 15 feet each).

(3) Approximate Dates of Usage. 1956 to present.

(4) Operating Practices. Flow is received from the troop area. Sludges are periodically removed and stored in the sewage sludge waste pile.

(5) Present Condition and Status. Operational. The sludge beds are scheduled to be enlarged to 3,400 square feet.

c. Specific Wastes Disposed. Domestic wastewater from the troop area at the north end of the depot.

d. Migration Pathways. Surface water, ground water.

e. Evidence of Release: The NPDES permit violations for biochemical oxygen demand and suspended solids in 1986 (due to high flow rate due to rain and sloughing of microbial solids from the RBC's).

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. None.

h. References. 6, 7, 8, 9, 10, 11, 15, 19, 22.

21. MAP LOCATION/SITE NUMBER. SEAD-22.

a. Unit Name. STP No. 314.

b. Unit Characteristics.

(1) Unit Type. Abandoned sewage treatment plant.

(2) Design Features. Old plant included a bar screen, an Imhoff tank, a 30-foot diameter trickling filter, a secondary clarifier, a chlorination chamber, and a sludge drying bed. The plant was converted to a lift station for STP No. 4 in 1978. The design flow capacity was 100,000 gallons per day.

(3) Approximate Dates of Usage. 1941 to October 1978 when converted to a lift station.

(4) Operating Practices. Received flow from the warehouse area and discharged to Kendaia Creek.

(5) Present Condition and Status. Presently a lift station for STP No. 4. All parts of the original operation have been removed or filled and covered with shale and soil. The area is grassy, but several parts of the foundation can be seen.

c. Specific Wastes Disposed. Domestic wastewater from the warehouse area.

d. Migration Pathways. Surface water, ground water.

e. Evidence of Release. None.

f. Exposure Potential. Low.

g. Recommendations for Sampling. None.

h. References. 6, 7, 8, 9, 10.

22. MAP LOCATION/SITE NUMBER. SEAD-23.

a. Unit Name. Demolition Ground.

b. Unit Characteristics.

(1) Unit Type. Open burning (OB)/open detonation (OD) grounds.

(2) Design Features. The OB/OD grounds consist of a detonation hill and nine burning pads (A through J) on a 90-acre site. The pads are constructed of broken shale, and the hill is glacial material which is moved around for the detonation activities. Figure C-3 shows the area.

(3) Approximate Dates of Usage. The detonation area has been in use from 1941 to the present, and the burning pads have been used since the late 1950's.

(4) Operating Practices.

(a) Detonation Hill. Material to be detonated is placed in a bulldozed hole with demolition material to destroy the ammunition or components. Primer cord is attached to the demolition material, blasting caps are attached to the primer cord, and the primer cord is attached to the circuit wire. The hole is backfilled and a minimum of 8 feet of soil is placed over the material to be detonated. The operator detonates the material after returning to the dugout and taking the proper safety precautions.

(b) Burning Pads. Combustible beds of pallets and wooden boxes are prepared on the pads, and the ammunition or components to be destroyed are placed on the beds. A trail of propellant approximately 5-feet long, 6-inches wide, and 3-inches deep is placed on the ground leading to the combustible bed. Electric squib is placed in the propellant trail and connected to firing wires. The operator fires the circuits from the office after taking the proper safety precautions. All metal parts are recovered for recycling through the DRMO.

(5) Present Condition and Status. The detonation ground is active, but the burning ground pads are scheduled to be closed and replaced with burning in troughs. The site is included in the revised RCRA Part B permit application.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Large obsolete and unserviceable ammunition and components are destroyed by detonation. Explosives-contaminated trash, fuzes containing lead compounds, and projectiles containing TNT, Comp B, and Amatol are burned on the pads.

(2) Physical and Chemical Characteristics. Heavy metals, nitrates, and explosives compounds are the constituents of concerns.

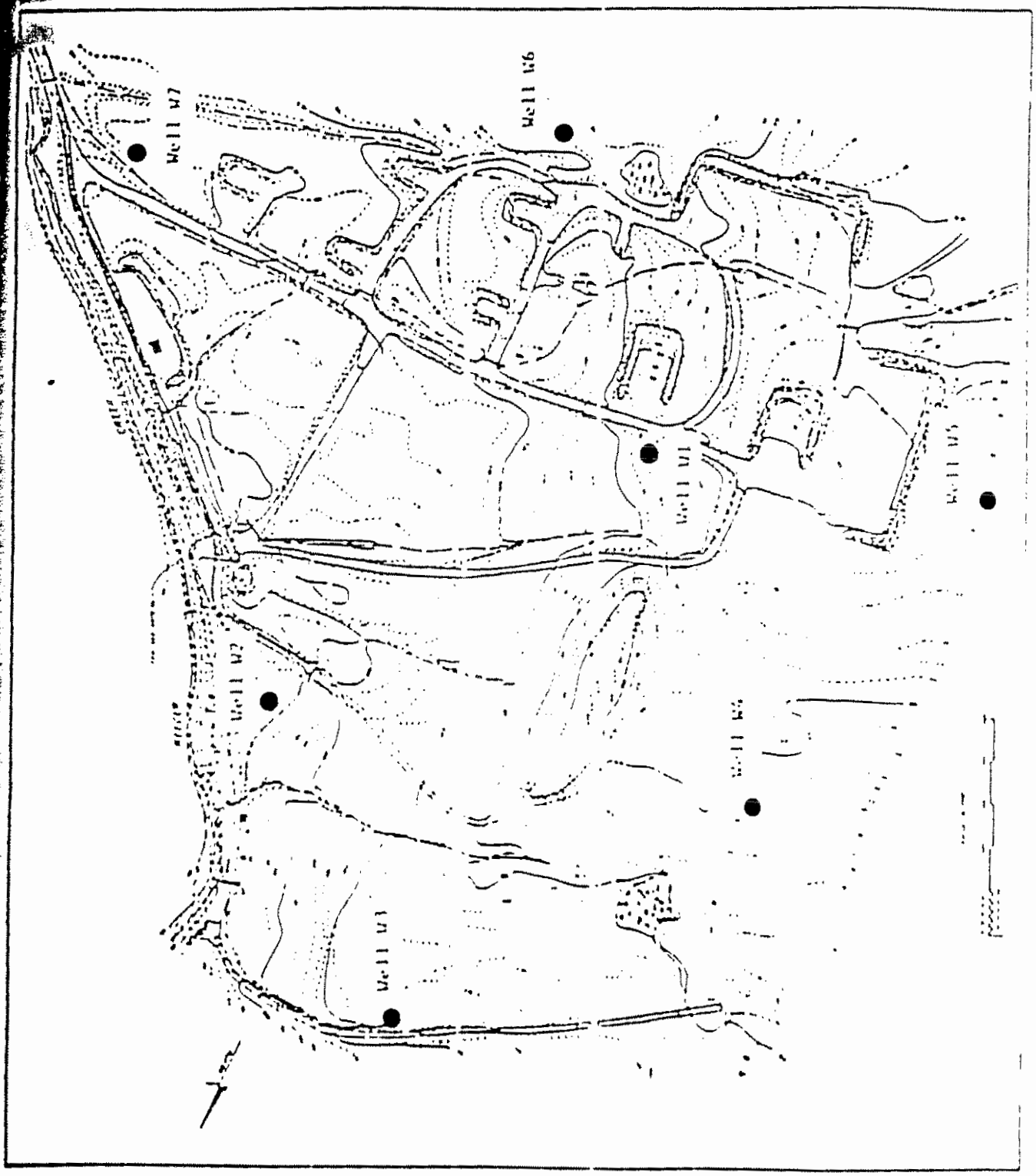

FIGURE C-3. Map of the Demolition Ground at Seneca Army Depot.

(3) Migration and Dispersal Characteristics. The metals, nitrates, and explosives can migrate in the ground water, but can also be adsorbed onto the soil (particularly the clay particles).

(4) Toxicological Characteristics. Army-suggested drinking water limits are available for 2,4,6-TNT and for RDX. The explosive compound 2,4-DNT is a suspected carcinogen. Drinking water limits are available for many of the heavy metals.

d. Migration Pathways. Air, soil, ground water, surface water.

e. Evidence of Release. Table C-2 lists the ground-water level and quality data available for the demolition grounds. Ground-water contamination by metals and explosive compounds may be present in the active section of the burning pad area, but the perimeter ground-water monitoring wells remain clean.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. No additional sampling is recommended. Continue to monitor the perimeter wells.

h. References. 6, 9, 10, 12, 16, 18, 21, 22.

TABLE C-2.

SAMPLING SITES RESULTS

TABLE C-2. Sampling Sites Results

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS						
				B W5	W4	W6	W1	W3	W2	W7
WATER										
LEVELS (A)	04 JAN 82		FT	118.5	109.7	110.8	111.3	105.3	95.4	98.4
LEVELS (A)	13 APR 82		FT	118.2	109.4	110.9	111.6	105.4	94.7	103.3
LEVELS (A)	28 JUN 82		FT	116.3	108.2	108.7	108.2	102.6	93.4	99.9
LEVELS (A)	27 SEP 82		FT	112.9	107.2	105.2	108.6	99.7	92.6	
LEVELS (A)	07 FEB 83		FT	118.2	109.8	110.5	110.9	105.2	94.6	103.0
LEVELS (A)	08 AUG 83		FT	112.9	106.1	105.0		99.9	92.3	
LEVELS (A)	14 FEB 84		FT	118.3	108.9	109.7	109.3	105.5	94.9	103.1
LEVELS (A)	26 JUN 84		FT	109.4		109.6	109.3	104.6	94.8	99.3
LEVELS (A)	27 JUN 84		FT		109.0					
LEVELS (A)	17 SEP 84		FT	115.8	107.9	108.6	109.3	103.6	93.7	100.7
LEVELS (A)	19 MAR 85		FT	D	110.2	110.3	110.5	105.3	93.7	103.6
LEVELS (A)	12 SEP 85		FT	113.1		104.3	106.3	99.4	92.3	
LEVELS (A)	17 MAR 86		FT	118.5	110.8	110.0	112.9	105.5	95.7	104.0
LEVELS (A)	16 SEP 86		FT	115.7	108.3	107.7	107.5	102.5	93.1	99.8
LEVELS (A)	16 MAR 87		FT	118.5	109.8	111.0	110.5	104.9	94.1	102.8

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B W5	W4	W6	W1	W3	W2	W7
ARSENIC	05 JAN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
ARSENIC	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
ARSENIC	29 JUN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
ARSENIC	28 SEP 82	.010	MGL	ND		ND	ND	ND	ND	
BARIUM	05 JAN 82	.10	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	13 APR 82	.10	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	29 JUN 82	.10	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	28 SEP 82	.10	MGL	ND		ND	ND	ND	ND	
CADMIUM	05 JAN 82	5.000	UGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	13 APR 82	5.000	UGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	29 JUN 82	5.000	UGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	28 SEP 82	5.000	UGL	ND		ND	ND	ND	ND	
CHROMIUM	05 JAN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	29 JUN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	28 SEP 82	.010	MGL	ND		ND	ND	ND	ND	
FLUORIDE	05 JAN 82	.1	MGL	.3	.2	.3	.1	.2	.1	.3
FLUORIDE	13 APR 82	.1	MGL	.3	.2	.2	.2	.2	.1	.2
FLUORIDE	29 JUN 82	1	MGL	.4	.2	.2	.2	.2	.2	.3
FLUORIDE	28 SEP 82	.1	MGL	.3	.2	.2	.2	.2	.2	
LEAD	05 JAN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
LEAD	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
LEAD	29 JUN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
LEAD	28 SEP 82	.010	MGL	ND		ND	ND	ND	ND	
MERCURY	05 JAN 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	13 APR 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	29 JUN 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	28 SEP 82	.2	UGL	ND	ND	ND	ND	ND	ND	
NO2+NO3 AS N	05 JAN 82	.05	MGL	6.70	.71	1.20	1.60	.08	ND	.22
NO2+NO3 AS N	13 APR 82	.05	MGL	5.00	.49	1.00	1.00	.13	ND	.38
NO2+NO3 AS N	29 JUN 82	.05	MGL	6.00	.52	2.00	2.00	.06	ND	.30
NO2+NO3 AS N	28 SEP 82	05	MGL	10.00	.12	3.00	2.00	.08	ND	
SELENIUM	05 JAN 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SELENIUM	13 APR 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SELENIUM	29 JUN 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SELENIUM	28 SEP 82	.005	MGL	ND		ND	ND	ND	ND	
SILVER	05 JAN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	29 JUN 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	28 SEP 82	.010	MGL	ND		ND	ND	ND	ND	
ENDRIN	05 JAN 82	.04	UGL	ND	ND	ND	ND	ND	ND	ND

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B	W5	W4	W6	W1	W3	W2	W7
ENDRIN	13 APR 82	40.00	UGL		ND	ND	ND	ND	ND	ND	ND
ENDRIN	29 JUN 82	.04	UGL		ND	ND	ND	ND	ND	ND	ND
ENDRIN	28 SEP 82	.04	UGL		ND		ND	ND	ND	ND	
LINDANE	05 JAN 82	.08	UGL		ND	ND	ND	ND	ND	ND	ND
LINDANE	13 APR 82	.08	UGL		ND	ND	ND	ND	ND	ND	ND
LINDANE	29 JUN 82	.08	UGL		ND	ND	ND	ND	ND	ND	ND
LINDANE	28 SEP 82	.08	UGL		ND		ND	ND	ND	ND	
TOXAPHENE	05 JAN 82	1.6	UGL		ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	13 APR 82	1.6	UGL		ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	29 JUN 82	1.6	UGL		ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	28 SEP 82	1.6	UGL		ND		ND	ND	ND	ND	
METHOXYCHLOR	05 JAN 82	1.6	UGL		ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	13 APR 82	1.6	UGL		ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	29 JUN 82	1.6	UGL		ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	28 SEP 82	1.6	UGL		ND		ND	ND	ND	ND	
2,4-D	05 JAN 82	3.8	UGL		ND	ND	ND	ND	ND	ND	ND
2,4-D	13 APR 82	3.8	UGL		ND	ND	ND	ND	ND	ND	ND
2,4-D	29 JUN 82	3.8	UGL		ND	ND	ND	ND	ND	ND	ND
2,4-D	28 SEP 82	3.8	UGL		ND		ND	ND	ND	ND	
SILVEX	05 JAN 82	.5	UGL		ND	ND	ND	ND	ND	ND	ND
SILVEX	13 APR 82	.5	UGL		ND	ND	ND	ND	ND	ND	ND
SILVEX	29 JUN 82	.5	UGL		ND	ND	ND	ND	ND	ND	ND
SILVEX	28 SEP 82	.5	UGL		ND		ND	ND	ND	ND	
GROSS ALPHA	05 JAN 82	4.61	PCL		ND	ND	ND	ND	ND	4.14	ND
GROSS ALPHA	13 APR 82	3.37	PCL		3.33	ND	2.63	2.30	3.64	3.39	ND
GROSS ALPHA	29 JUN 82	6.49	PCL		4.81	4.26	5.99	ND	12.60	9.04	3.87
GROSS ALPHA	28 SEP 82	5.20	PCL		ND		ND	ND	ND		
RADIUM-226	28 JUN 82	.24	PCL				ND	.27	ND	ND	
RADIUM-226	28 SEP 82	.18	PCL		ND						
GROSS BETA	05 JAN 82	1.52	PCL		2.02	3.01	2.06	2.31	2.91	2.12	ND
GROSS BETA	13 APR 82	1.64	PCL		ND	1.60	ND	2.05	2.08	ND	ND
GROSS BETA	29 JUN 82	1.86	PCL		1.59	3.34	ND	1.62	1.96	1.99	ND
GROSS BETA	28 SEP 82	1.76	PCL		ND		1.22	1.85	3.14		
CHLORIDE	05 JAN 82	1.0	MGL		4.6	10.0	17.6	7.9	28.5	5.8	3.5
CHLORIDE	13 APR 82	1.0	MGL		4.0	9.0	3.0	4.0	46.0	4.9	2.0
CHLORIDE	29 JUN 82	1.0	MGL		9.0	9.0	11.0	12.0	51.0	10.0	7.0
CHLORIDE	28 SEP 82	1.0	MGL		1.0	ND	ND	3.0	11.2	6.0	
CHLORIDE	08 FEB 83	1.0	MGL		2.0	6.0	7.0	6.0	9.0	3.0	2.0
CHLORIDE	09 AUG 83	1.0	MGL		3.0	5.0	3.0		15.0	4.0	
CHLORIDE	14 FEB 84	2.0	MGL		ND	8.7	20.0	2.3	4.0	ND	ND
CHLORIDE	20 MAR 85	1.0	MGL			5.0	12.0	2.0	15.0	4.0	3.0

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B						
				W5	W4	W6	W1	W3	W2	W7
CHLORIDE	18 MAR 86	1.0	MG/L	3.0	5.0	4.0	5.0	6.0	1.0	2.0
CHLORIDE	17 MAR 87	1.0	MG/L	2.0	4.0	4.0	6.0	5.0	3.0	1.0
IRON	05 JAN 82	.02	MG/L	.13	.15	.27	.15	.19	.10	.14
IRON	13 APR 82	.03	MG/L	ND	.08	.09	.10	.10	.02	.10
IRON	29 JUN 82	.03	MG/L	ND	.24	.26	.44*	.06	.09	.70*
IRON	28 SEP 82	.02	MG/L	.12		.24	.19	.23	.09	
IRON	09 FEB 83	.02	MG/L	.13	.10	.15	.09	.07	.06	.08
IRON	09 AUG 83	.02	MG/L	.09	.16	.25		.07	.12	
IRON	14 FEB 84	.10	MG/L	.15	.11	ND	ND	ND	ND	1.02*
IRON	20 MAR 85	.10	MG/L		ND	ND	ND	ND	ND	ND
IRON	18 MAR 86	.03	MG/L	ND	ND	.03	ND	ND	ND	ND
IRON	17 MAR 87	.10	MG/L	ND	ND	ND	ND	ND	ND	ND
MANGANESE	05 JAN 82	.010	MG/L	.270*	.040	.300*	ND	ND	.070*	.090*
MANGANESE	13 APR 82	.010	MG/L	.100*	.060*	.040	.020	ND	.050	.030
MANGANESE	29 JUN 82	.001	MG/L	.210*	.050	.020	.020	.030	.130*	.010
MANGANESE	28 SEP 82	.010	MG/L	ND		ND	ND	.040	.160*	
MANGANESE	08 FEB 83	.010	MG/L	.020	.120*	.020	ND	ND	.010	.010
MANGANESE	09 AUG 83	.001	MG/L	.120*	.320*	.030		.020	.210*	
MANGANESE	14 FEB 84	.030	MG/L	ND	ND	.035	ND	ND	ND	ND
MANGANESE	20 MAR 85	.030	MG/L		.085*	.045	ND	ND	.038	ND
MANGANESE	18 MAR 86	.010	MG/L	ND	.120*	ND	ND	ND	ND	ND
MANGANESE	17 MAR 87	.030	MG/L	.078*	.235*	ND	ND	ND	ND	ND
PHENOL	05 JAN 82	.01	MG/L	ND	ND	ND	ND	ND	ND	ND
PHENOL	13 APR 82	.01	MG/L	ND	ND	ND	ND	ND	ND	ND
PHENOL	29 JUN 82	.01	MG/L	ND	ND	ND	.018	ND	ND	ND
PHENOL	28 SEP 82	.01	MG/L	.018	.018	ND	.028	ND	.018	
PHENOL	09 FEB 83	.01	MG/L	ND	ND	ND	ND	ND	ND	ND
PHENOL	09 AUG 83	.01	MG/L	ND	ND	ND		ND	ND	
PHENOL	14 FEB 84	.01	MG/L	ND	ND	ND	ND	ND	ND	ND
PHENOL	20 MAR 85	.01	MG/L		ND	ND	ND	ND	ND	ND
PHENOL	18 MAR 86	.01	MG/L	ND	ND	ND	ND	ND	ND	ND
PHENOL	17 MAR 87	.01	MG/L	ND	ND	ND	ND	ND	ND	ND
SODIUM	05 JAN 82	1	MG/L	15	28	20	15	14	22.	12.
SODIUM	13 APR 82	1	MG/L	10	17	9	11	15	21.	10.
SODIUM	29 JUN 82	1	MG/L	12	11	9	15	20	24	8
SODIUM	28 SEP 82	1	MG/L	12		9	8	10	16	
SODIUM	08 FEB 83	1	MG/L	21	17	11	12	8	15	7
SODIUM	09 AUG 83	1	MG/L	16	16	11		9	15	
SODIUM	14 FEB 84	1	MG/L			16	6	4	14	3
SODIUM	20 MAR 85	1	MG/L		21	24	9	7	9	2
SODIUM	18 MAR 86	1	MG/L	9	20	10	7	6	6	4

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B W5	W4	W6	W1	W3	W2	W7
SODIUM	17 MAR 87	1.	MGL	8.	30.	14.	11.	6.	9.	4.
SULFATE	05 JAN 82	2.0	MGL	57.5	327.08	38.8	233.0	147.0	225.0	77.0
SULFATE	13 APR 82	2.0	MGL	110.0	330.08	100.0	220.0	210.0	263.08	84.0
SULFATE	29 JUN 82	2.0	MGL	110.0	150.0	100.0	200.08	220.0	293.08	70.0
SULFATE	28 SEP 82	2.0	MGL	130.0	81.0	88.0	180.0	194.0	280.08	
SULFATE	08 FEB 83	2.0	MGL	93.0	600.08	110.0	210.0	180.0	200.0	74.0
SULFATE	09 AUG 83	2.0	MGL	129.0	333.08	106.0		215.0	203.0	
SULFATE	14 FEB 84	2.0	MGL	51.0	117.0	130.0	119.0	148.0	108.0	7.3
SULFATE	20 MAR 85	2.0	MGL		306.08	231.0	231.0	194.0	180.0	47.0
SULFATE	18 MAR 86	2.0	MGL	77.0	283.08	63.0	248.0	148.0	117.0	57.0
SULFATE	17 MAR 87	2.0	MGL	24.0	255.08	67.0	160.0	56.0	6.0	27.0
COND(FIELD)	20 MAR 85	1	UMC		680.	440.	540.	550.	490.	270.
COND(FIELD)	18 MAR 86	1	UMC	415.	650.	315.	460.	440.	340.	240.
COND(FIELD)	18 MAR 86	1.	UMC	415.	645.	320.	460.	440.	335.	240.
COND(FIELD)	18 MAR 86	1	UMC	415.	650.	315.	460.	450.	335.	240.
COND(FIELD)	18 MAR 86	1	UMC	415.	645.	310.	460.	445.	335.	235.
COND(FIELD)	17 MAR 87	1	UMC	380.	700.	400	500.	445.	450.	310.
COND(FIELD)	17 MAR 87	1	UMC	375.	705.	400.	495.	440.	445.	315.
COND(FIELD)	17 MAR 87	1	UMC	370.	700.	405.	500.	445.	450.	315.
COND(FIELD)	17 MAR 87	1	UMC	375	695.	405.	500.	440.	440.	315.
PH(FIELD)	05 JAN 82		PH	7.3	7.2	7.5	7.2	7.4	7.3	7.1
PH(FIELD)	05 JAN 82		PH	7.3	7.2	7.5	7.2	7.4	7.3	7.1
PH(FIELD)	05 JAN 82		PH	7.3	7.2	7.5	7.2	7.4	7.3	7.1
PH(FIELD)	05 JAN 82		PH	7.3	7.2	7.5	7.2	7.4	7.3	7.1
PH(FIELD)	13 APR 82		PH	7.6	7.2	7.6	7.6	7.4	7.4	7.4
PH(FIELD)	13 APR 82		PH	7.6	7.2	7.6	7.6	7.4	7.4	7.4
PH(FIELD)	13 APR 82		PH	7.6	7.2	7.6	7.6	7.4	7.4	7.4
PH(FIELD)	13 APR 82		PH	7.6	7.2	7.6	7.6	7.4	7.4	7.4
PH(FIELD)	29 JUN 82		PH	7.8	7.8	7.8	8.1	7.7	7.8	7.8
PH(FIELD)	29 JUN 82		PH	7.8	7.8	7.8	8.1	7.7	7.8	7.8
PH(FIELD)	29 JUN 82		PH	7.8	7.8	7.8	8.1	7.7	7.8	7.8
PH(FIELD)	29 JUN 82		PH	7.8	7.8	7.8	8.1	7.7	7.8	7.8
PH(FIELD)	27 SEP 82		PH	7.6	7.9	7.7	7.5	7.5	7.6	
PH(FIELD)	27 SEP 82		PH	7.6	7.9	7.7	7.5	7.5	7.6	
PH(FIELD)	27 SEP 82		PH	7.6	7.9	7.7	7.5	7.5	7.6	
PH(FIELD)	27 SEP 82		PH	7.6	7.9	7.7	7.5	7.5	7.6	
PH(FIELD)	08 FEB 83		PH	7.8	7.3	7.8	7.5	7.5	7.7	7.6
PH(FIELD)	08 FEB 83		PH	7.8	7.3	7.8	7.5	7.5	7.7	7.6
PH(FIELD)	08 FEB 83		PH	7.8	7.3	7.8	7.5	7.5	7.7	7.6
PH(FIELD)	08 FEB 83		PH	7.8	7.3	7.8	7.5	7.5	7.7	7.6
PH(FIELD)	09 AUG 83		PH	7.1	6.9	6.9		7.0	7.1	

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B W5	W4	W6	W1	W3	W2	F7
PH(FIELD)	09 AUG 83		PH	7.1	6.9	6.9		7.0	7.1	
PH(FIELD)	09 AUG 83		PH	7.1	6.9	6.9		7.0	7.1	
PH(FIELD)	09 AUG 83		PH	7.1	6.9	6.9		7.0	7.1	
PH(FIELD)	14 FEB 84		PH	7.1	6.8	7.2	7.3	7.4	7.4	7.5
PH(FIELD)	14 FEB 84		PH	7.1	6.9	7.2	7.3	7.4	7.5	7.5
PH(FIELD)	14 FEB 84		PH	7.4	6.8	7.3	7.3	7.4	7.4	7.6
PH(FIELD)	14 FEB 84		PH	7.3	6.9	7.3	7.3	7.5	7.4	7.6
PH(FIELD)	27 JUN 84		PH	7.0	6.8	7.1	7.1	7.0	7.1	7.1
PH(FIELD)	18 SEP 84		PH	8.4	7.5	7.6	7.6	7.5	7.1	7.6
PH(FIELD)	18 SEP 84		PH	8.3	7.6	7.5	7.7	7.4	7.1	7.5
PH(FIELD)	18 SEP 84		PH	8.4	7.6	7.5	7.7	7.4	7.1	7.5
PH(FIELD)	19 SEP 84		PH	8.3	7.5	7.6	7.6	7.4	7.2	7.5
PH(FIELD)	20 MAR 85		PH		6.8	6.9	6.7	6.8	7.0	7.0
PH(FIELD)	13 SEP 85		PH	7.1		7.1	7.1	7.1	7.0	
PH(FIELD)	19 MAR 86		PH	7.1	6.8	7.4	7.2	7.0	7.2	7.3
PH(FIELD)	18 MAR 86		PH	7.1	6.9	7.4	7.3	7.1	7.3	7.3
PH(FIELD)	18 MAR 86		PH	7.1	6.8	7.4	7.2	7.0	7.3	7.3
PH(FIELD)	18 MAR 86		PH	7.1	6.8	7.1	7.1	7.0	7.2	7.3
PH(FIELD)	16 SEP 86		PH	7.1	7.0	7.4	6.9	7.0	7.0	7.2
PH(FIELD)	17 MAR 87		PH	6.9	7.3	7.4	6.9	7.2	7.1	6.9
PH(FIELD)	17 MAR 87		PH	7.0	7.2	7.4	6.8	7.1	7.0	7.0
PH(FIELD)	17 MAR 87		PH	6.8	7.1	7.5	6.9	7.1	6.9	6.8
PH(FIELD)	17 MAR 87		PH	6.9	7.2	7.4	6.9	7.1	6.9	6.9
PH(LAB)	14 FEB 84		PH	7.9	7.7	7.8	7.7	7.8	7.9	7.5
SPEC COND	05 JAN 82	1	UMH	730	1130	720	850.	860	930.	640.
SPEC COND	05 JAN 82	1	UMH	730	1120	722	850.	860	920.	640.
SPEC COND	05 JAN 82	1	UMH	730	1130	720	850	850	930.	640.
SPEC COND	05 JAN 82	1	UMH	730	1130	720	850	850	920.	640.
SPEC COND	13 APR 82	1	UMH	719	1303	699	810	1000	975.	639.
SPEC COND	13 APR 82	1	UMH	718	1302	699	810.	1000	972.	639.
SPEC COND	13 APR 82	1	UMH	719	1301	699	810	1000	974	640.
SPEC COND	13 APR 82	1	UMH	720	1300	699	810	1000	973	638.
SPEC COND	29 JUN 82	1	UMH	620	590	580	750	1040	890.	490.
SPEC COND	29 JUN 82	1	UMH	620	590	580	760	1030	890.	490.
SPEC COND	29 JUN 82	1	UMH	620	600	585	760	1030	890	490.
SPEC COND	29 JUN 82	1	UMH	620	600	580	750	1030	890	490.
SPEC COND	28 SEP 82	1	UMH	700		665	700	925	980	
SPEC COND	28 SEP 82	1	UMH	700		665	700	920	980	
SPEC COND	28 SEP 82	1	UMH	700		665	700	920	980	
SPEC COND	28 SEP 82	1	UMH	700		665	700	920	980	
SPEC COND	29 FEB 84	1	UMH	780	1100	685	760	980	925	605

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B						
				W5	W4	W6	W1	W3	W2	W7
SPEC COND	08 FEB 83	1	UMHO	580.	1160.	690.	755.	680.	755.	605.
SPEC COND	08 FEB 83	1	UMHO	585	1160.	680.	755.	680.	760.	600.
SPEC COND	08 FEB 83	1	UMHO	580.	1160.	685.	760.	685.	760.	600.
SPEC COND	09 AUG 83	1	UMHO	900.	1190.	1020.		1050.	930.	
SPEC COND	09 AUG 83	1	UMHO	890.	1200.	1020.		1050.	940.	
SPEC COND	09 AUG 83	1	UMHO	890	1190.	1020.		1040.	940.	
SPEC COND	09 AUG 83	1	UMHO	900	1200.	1020.		1040.	940.	
SPEC COND	14 FEB 84	1	UMHO	360.	430.	620.	400.	500.	570.	88.
SPEC COND	14 FEB 84	1	UMHO	360.	420.	620.	410.	510.	580.	87.
SPEC COND	14 FEB 84	1	UMHO	360.	430.	620.	400.	510.	580.	88.
SPEC COND	14 FEB 84	1	UMHO	360.	430.	630.	400.	510.	570.	88.
SPEC COND	18 SEP 84	1	UMHO	710.	1000.	620.	670.	760.	860.	500.
SPEC COND	18 SEP 84	1	UMHO	720.	990.	620.	680.	760.	860.	500.
SPEC COND	18 SEP 84	1	UMHO	720	1000.	620.	680.	760.	860.	490.
SPEC COND	18 SEP 84	1	UMHO	720.	1000.	620.	680.	760.	860.	510.
SPEC COND	20 MAR 85	1	UMHO		990.	700.	750.	760.	750.	390.
SPEC COND	20 MAR 85	1	UMHO		1000.	700.	750.	760.	740.	400.
SPEC COND	20 MAR 85	1	UMHO		1000.	700	750.	760.	740.	390.
SPEC COND	20 MAR 85	1	UMHO		990.	700.	760.	760.	740.	390.
SPEC COND	13 SEP 85	1	UMHO	720		610.	880.	830.	840.	
SPEC COND	13 SEP 85	1	UMHO	720		600.	880.	840.	840.	
SPEC COND	13 SEP 85	1	UMHO	730.		600.	870.	840.	840.	
SPEC COND	13 SEP 85	1	UMHO	730		600.	880.	830.	830.	
SPEC COND	18 MAR 86	1	UMHO	590.	960.	490.	670.	620.	520.	3600.
SPEC COND	18 MAR 86	1	UMHO	590.	960.	500.	660.	620.	520.	3600.
SPEC COND	18 MAR 86	1	UMHO	590	950.	500.	670.	620.	520.	3600.
SPEC COND	18 MAR 86	1	UMHO	590	950.	490.	660.	610.	520.	3600.
SPEC COND	16 SEP 86	1	UMHO	710	1160.	690.	870.	950.	820.	600.
SPEC COND	16 SEP 86	1	UMHO	720	1150.	690.	880.	950.	810.	600.
SPEC COND	16 SEP 86	1	UMHO	710	1150	690.	880.	950.	820.	600.
SPEC COND	16 SEP 86	1	UMHO	720	1160	690.	880.	960.	820.	610.
SPEC COND	17 MAR 87	1	UMHO	640	990	670.	820.	710.	730.	530.
SPEC COND	17 MAR 87	1	UMHO	630	1000	680.	810.	710.	730.	530.
SPEC COND	17 MAR 87	1	UMHO	630	1000	680	820.	720.	730.	530.
SPEC COND	17 MAR 87	1	UMHO	640	1000.	690.	820.	710.	740.	520.
TOC	05 JAN 82	1	MG/L	1.0	1.0	1.0	1.0	4.0	1.0	1.0
TOC	05 JAN 82	1	MG/L	1.0	1.0	1.0	1.0	4.0	1.0	1.0
TOC	05 JAN 82	1	MG/L	1.0	1.0	1.0	1.0	4.0	1.0	1.0
TOC	05 JAN 82	1	MG/L	1.0	1.0	1.0	1.0	4.0	1.0	1.0
TOC	13 APR 82	1	MG/L	39.0	54.0	40.0	37.0	48.0	44.0	40.0
TOC	13 APR 82	1	MG/L	39.0	54.0	40.0	37.0	47.0	44.0	40.0

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B W5	W4	W6	W1	W3	W2	W7
TOC	13 APR 82	.1	MGL	40.0	54.0	42.0	37.0	47.0	44.0	40.0
TOC	13 APR 82	.1	MGL	39.0	55.0	43.0	37.0	48.0	44.0	40.0
TOC	29 JUN 82	.1	MGL	43.0	30.0	43.0	42.0	53.0	42.0	38.0
TOC	29 JUN 82	.1	MGL	42.0	30.0	41.0	40.0	53.0	42.0	39.0
TOC	29 JUN 82	.1	MGL	42.0	30.0	43.0	40.0	54.0	41.0	40.0
TOC	29 JUN 82	.1	MGL	42.0	30.0	43.0	42.0	54.0	43.0	38.0
TOC	28 SEP 82	.1	MGL	37.0	28.0	39.0	21.0	44.0	4.0	
TOC	28 SEP 82	.1	MGL	38.0	29.0	39.0	23.0	43.0	4.0	
TOC	28 SEP 82	.1	MGL	37.0	27.0	39.0	22.0	43.0	4.0	
TOC	28 SEP 82	.1	MGL	38.0	28.0	39.0	22.0	43.0	4.0	
TOC	08 FEB 83	.1	MGL	23.0	32.0	26.0	22.0	27.0	25.0	26.0
TOC	08 FEB 83	.1	MGL	23.0	33.0	27.0	22.0	26.0	25.0	26.0
TOC	08 FEB 83	.1	MGL	24.0	32.0	27.0	22.0	27.0	25.0	26.0
TOC	08 FEB 83	.1	MGL	23.0	33.0	27.0	22.0	27.0	25.0	26.0
TOC	09 AUG 83	.1	MGL	53.0	47.0	46.0		74.0	23.0	
TOC	09 AUG 83	.1	MGL	53.0	47.0	47.0		74.0	22.0	
TOC	09 AUG 83	.1	MGL	54.0	46.0	45.0		74.0	21.0	
TOC	09 AUG 83	.1	MGL	53.0	46.0	46.0		74.0	22.0	
TOC	14 FEB 84	.1	MGL	24.0	35.0	32.0	24.0	29.0	29.0	12.0
TOC	14 FEB 84	.1	MGL	23.0	36.0	33.0	24.0	29.0	29.0	11.0
TOC	14 FEB 84	.1	MGL	23.0	36.0	33.0	24.0	29.0	30.0	11.0
TOC	14 FEB 84	.1	MGL	24.0	35.0	32.0	24.0	29.0	29.0	11.0
TOC	18 SEP 84	.1	MGL	3.0	3.0	3.0	3.0	4.0	3.0	3.0
TOC	18 SEP 84	.1	MGL	3.0	4.0	3.0	3.0	4.0	3.0	4.0
TOC	18 SEP 84	.1	MGL	3.0	4.0	3.0	3.0	4.0	3.0	2.0
TOC	18 SEP 84	.1	MGL	3.0	4.0	3.0	3.0	5.0	4.0	3.0
TOC	20 MAR 85	.1	MGL		5.9	8.8	5.9	6.0	4.1	9.5
TOC	20 MAR 85	.1	MGL		5.7	8.8	6.1	6.0	4.0	9.6
TOC	20 MAR 85	.1	MGL		5.8	8.7	5.8	6.0	4.1	9.4
TOC	20 MAR 85	.1	MGL		5.7	8.8	5.9	6.0	4.1	9.5
TOC	13 SEP 85	.1	MGL	3.4		3.0	2.7	3.3	3.1	
TOC	13 SEP 85	.1	MGL	3.4		2.7	2.5	3.2	3.3	
TOC	13 SEP 85	.1	MGL	3.4		2.8	2.6	3.3	3.1	
TOC	13 SEP 85	.1	MGL	3.4		2.9	2.5	3.3	3.5	
TOC	18 MAR 86	.1	MGL	3.4	3.6	6.3	5.0	5.4	3.5	4.2
TOC	18 MAR 86	.1	MGL	3.4	3.5	6.3	5.0	5.1	3.5	4.2
TOC	18 MAR 86	.1	MGL	3.4	3.5	6.4	5.0	5.1	3.4	4.2
TOC	18 MAR 86	.1	MGL	3.4	3.5	6.2	5.2	5.2	3.6	4.2
TOC	16 SEP 86	.1	MGL	5.1	4.7	5.3	5.2	6.2	4.7	5.2
TOC	16 SEP 86	.1	MGL	5.0	4.7	5.4	5.4	6.2	4.9	5.1
TOC	16 SEP 86	.1	MGL	5.0	4.8	5.4	5.4	6.3	4.7	5.1

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B	W5	W4	W6	W1	W3	W2	W7
TOC	16 SEP 86	.1	MGL	4.9	4.8	5.5	5.4	6.2	4.8	5.2	
TOC	17 MAR 87	.1	MGL	5.0	3.8	3.7	2.3	5.6	4.0	3.6	
TOC	17 MAR 87	.1	MGL	5.0	3.7	3.8	2.2	5.5	4.0	3.6	
TOC	17 MAR 87	.1	MGL	4.9	3.6	3.7	2.2	5.5	3.9	3.5	
TOC	17 MAR 87	.1	MGL	5.0	3.7	3.8	2.1	5.6	4.0	3.5	
TOX	05 JAN 82	.010	MGL	ND	.060	.033	.016	.063	.048	.021	
TOX	05 JAN 82	.010	MGL	ND	.050	.025	ND	.038	.059	.039	
TOX	05 JAN 82	.010	MGL	ND	.050	.014	.019	.048	.015	.034	
TOX	05 JAN 82	.010	MGL	.016	.052	.013	.016	.046	.056	.020	
TOX	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	.014	
TOX	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND	
TOX	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND	
TOX	13 APR 82	.010	MGL	ND	ND	.012	ND	.011	ND	.010	
TOX	29 JUN 82	.010	MGL	ND	ND	ND	.017	.063	.068	.026	
TOX	29 JUN 82	.010	MGL	.064	ND	ND	.076	ND	.039	.028	
TOX	29 JUN 82	.010	MGL	.098	ND	.015	.070	.051	.026	.031	
TOX	29 JUN 82	.010	MGL	.045	ND	ND	.066	ND	.082	.020	
TOX	28 SEP 82	.010	MGL	.041		.130	.067	.096			
TOX	28 SEP 82	.010	MGL	ND		.080	ND	.069			
TOX	28 SEP 82	.010	MGL	ND		.095	.077	ND			
TOX	28 SEP 82	.010	MGL	ND		.095	.040	.062			
TOX	08 FEB 83	.010	MGL	.043	.030	.040	.039	.046	.017	.030	
TOX	08 FEB 83	.010	MGL	.042	.047	.047	.028	.046	.033	.038	
TOX	08 FEB 83	.010	MGL	.042	.041	.040	.044	.031	.039	.047	
TOX	08 FEB 83	.010	MGL	.036	.041	.043	.041	.056	.038	.036	
TOX	09 AUG 83	.010	MGL	.041	.040	.041		ND	ND		
TOX	09 AUG 83	.010	MGL	.036	.041	.036		ND	ND		
TOX	09 AUG 83	.010	MGL	.042	.038	.039		ND	ND		
TOX	09 AUG 83	.010	MGL	.040	.040	.036		ND	ND		
TOX	14 FEB 84	.010	MGL	.070	.064	ND	.037	.055	.064	ND	
TOX	14 FEB 84	.010	MGL	.060	.074	ND	.035	.055	.030	.014	
TOX	14 FEB 84	.010	MGL	.077	.041	ND	.036	.049	.044	.014	
TOX	14 FEB 84	.010	MGL	.032	.062	ND	.039	.064	.041	.012	
TOX	18 SEP 84	.010	MGL	.022	.016	ND	.015	.013	ND	.027	
TOX	18 SEP 84	.010	MGL	.022	.018	.011	.025	.012	ND	.034	
TOX	18 SEP 84	.010	MGL	.020	.016	ND	.013	ND	ND	.045	
TOX	18 SEP 84	.010	MGL	.021	.026	.012	.013		ND	.045	
TOX	20 MAR 85	.010	MGL		ND	ND	ND	ND	ND	.012	
TOX	20 MAR 85	.010	MGL		ND	ND	ND	ND	ND	.013	
TOX	20 MAR 85	.010	MGL		ND	ND	ND	ND	ND	.014	
TOX	20 MAR 85	.010	MGL		ND	ND	ND	ND	ND	.014	

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INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS						
				B W5	W4	W6	W1	W3	W2	W7
TOX	13 SEP 85	.010	MGL	ND		ND	ND	ND	ND	
TOX	13 SEP 85	.010	MGL	ND		ND	ND	ND	ND	
TOX	13 SEP 85	.010	MGL	ND		ND	ND	ND	ND	
TOX	13 SEP 85	.010	MGL	ND		ND	ND	ND	ND	
TOX	18 MAR 86	.010	MGL	ND	ND	.010	ND	ND	ND	ND
TOX	18 MAR 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	18 MAR 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	18 MAR 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOS	29 JUN 82	1	MGL	465.	431.	406.	672.*	704.*	698.*	382.
2,4,6 TRI	27 JUN 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4,6 TRI	19 SEP 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4,6 TRI	20 MAR 85	.001	MGL		ND	ND	ND	ND	ND	ND
2,4,6 TRI	13 SEP 85	.001	MGL	ND		ND	ND	ND	ND	
2,4,6 TRI	18 MAR 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4,6 TRI	16 SEP 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4,6 TRI	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4 DNT	27 JUN 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4 DNT	19 SEP 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4 DNT	20 MAR 85	.001	MGL		ND	ND	ND	ND	ND	ND
2,4 DNT	13 SEP 85	.001	MGL	ND		ND	ND	ND	ND	
2,4 DNT	18 MAR 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4 DNT	16 SEP 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4 DNT	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6 DNT	27 JUN 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6 DNT	19 SEP 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6 DNT	20 MAR 85	.001	MGL		ND	ND	ND	ND	ND	ND
2,6 DNT	13 SEP 85	.001	MGL	ND		ND	ND	ND	ND	
2,6 DNT	18 MAR 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6 DNT	16 SEP 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6 DNT	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	27 JUN 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	19 SEP 84	.001	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	17 MAR 87	.001	MGL		ND	ND	ND	ND	ND	ND

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B						
				W5	W4	W6	W1	W3	W2	W7
RDX	13 SEP 85	.030	MGL	ND		ND	ND	ND	ND	
RDX	18 MAR 86	.030	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	16 SEP 86	.030	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	17 MAR 87	.030	MGL	ND	ND	ND	ND	ND	ND	ND
HMX	27 JUN 84	.100	MGL	ND	ND	ND	ND	ND	ND	ND
HMX	18 SEP 84	.100	MGL	ND	ND	ND	ND	ND	ND	ND
HMX	20 MAR 85	.100	MGL		ND	ND	ND	ND	ND	ND
HMX	13 SEP 85	100	MGL	ND		ND	ND	ND	ND	
HMX	18 MAR 86	100	MGL	ND	ND	ND	ND	ND	ND	ND
HMX	16 SEP 86	100	MGL	ND.	ND	ND	ND	ND	ND	ND
HMX	17 MAR 87	100	MGL	ND	ND	ND	ND	ND	ND	ND
TETRYL	27 JUN 84	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TETRYL	18 SEP 84	010	MGL	ND	ND	ND	ND	ND	NC	ND
TETRYL	20 MAR 85	.010	MGL		ND	ND	ND	ND	ND	ND
TETRYL	13 SEP 85	010	MGL	ND		ND	ND	ND	ND	
TETRYL	18 MAR 86	005	MGL	ND	ND	ND	ND	ND	ND	ND
TETRYL	16 SEP 86	010	MGL	ND	ND	ND	ND	ND	ND	ND
TETRYL	17 MAR 87	010	MGL	ND	ND	ND	ND	ND	ND	ND

RUN DATE: 19 AUG 87

INSTALLATION: SENECA AD, NY SITE: DEMOLITION GROUNDS

LEGEND
NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.
B UPGRADIENT SITE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA
& VALUE EXCEEDS A STATE WATER QUALITY STANDARD OR CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TON - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

Interim Final Rpt, Ground-Water Contamination Surv No. 38-26-0868-88, 27-31 Jul 87

23. MAP LOCATION/SITE NUMBER. SEAD-24.

a. Unit Name. Abandoned Powder Burning Pit.

b. Unit Characteristics.

(1) Unit Type. Powder burning area.

(2) General Dimensions. U-shaped 4-foot high berm approximately 150-feet across and 325-feet long. An adjacent shale covered area which supports an aspen stand may also have been used.

(3) Approximate Dates of Usage. 1940's to 1950's.

(4) Operating Practices. Unknown.

(5) Present Condition and Status. Abandoned. Grasses growing in area inside berm.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Black powder, M10 and M6 solid propellants, probably explosives-contaminated trash.

(2) Physical and Chemical Characteristics. Explosives compounds are the primary constituents of concern.

(3) Migration and Dispersal Characteristics. Explosives compounds may migrate in the ground water.

(4) Toxicological Characteristics. Army-suggested drinking water limits are available for 2,4,6-TNT and RDX.

d. Migration Pathways. Soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. Soils samples and ground-water monitoring wells.

h. References. 6, 9.

24. MAP LOCATION/SITE NUMBER. SEAD-25.

a. Unit Name. Fire Training and Demonstration Pad.

b. Unit Characteristics.

(1) Unit Type. Fire training pad.

(2) General Dimensions. 20 feet in diameter.

(3) Approximate Dates of Usage. Since late 1960's.

(4) Operating Practices. At one time, the pad was used for fire training, but it is now used once or twice a year for fire fighting demonstrations.

(5) Present Condition and Status. Grass-covered.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Water-contaminated fuels and occasionally used oil.

(2) Physical and Chemical Characteristics. Breakdown products of petroleum products include benzene, xylene, and toluene. Lead may also be a constituent of concern if leaded fuels were used (very likely).

(3) Migration and Dispersal Characteristics. The petroleum breakdown products and heavy metals may migrate in the ground water.

(4) Toxicological Characteristics. Drinking water standards and recommended maximum contaminant levels are available for the constituents of concern.

d. Migration Pathways. Air, soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Low.

g. Recommendations for Sampling. Soil samples.

h. References. 9, 11.

25. MAP LOCATION/SITE NUMBER. SEAD-26.

a. Unit Name. Fire Training Pit.

b. Unit Characteristics.

(1) Unit Type. Fire training pit.

(2) Design Features. The pit is approximately 40 feet in diameter, and is lined with bentonite.

(3) Approximate Dates of Usage. 1977 to present. The bentonite liner was installed in 1982 or 1983.

(4) Operating Practices. Various flammable materials are floated on water, ignited, and extinguished.

(5) Present Condition and Status. Active.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Water-contaminated fuels and occasionally used oil.

(2) Physical and Chemical Characteristics. Breakdown products of petroleum products include benzene, xylene, and toluene. Lead may also be a constituent of concern if leaded fuels were used (very likely).

(3) Migration and Dispersal Characteristics. The petroleum breakdown products and heavy metals may migrate in the ground water.

(4) Toxicological Characteristics. Drinking water standards and recommended maximum contaminant levels are available for the constituents of concern.

d. Migration Pathways. Air, soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Low.

g. Recommendations for Sampling. Soil samples.

h. References. 9, 11.

26. MAP LOCATION/SITE NUMBER. SEAD-27.

a. Unit Name. Bldg 360 - Steam Cleaning Waste Tank.

b. Unit Characteristics.

(1) Unit Type. Open top in-building tank.

(2) Design Features. Open top concrete tank with a grate over the top. The dimensions are 35-feet long by 12-feet wide, and the deepest part is 4 feet. The capacity is 4,500 gallons when filled to near the top or 1,100 gallons to the 2-foot freeboard mark.

(3) Approximate Dates of Usage. 1976 to present.

(4) Operating Practices. When a piece of industrial plant equipment positioned over the grate is steam cleaned, the wastewater drains into the open tank. The waste is pumped out and disposed by a hazardous waste disposal contractor.

(5) Present Condition and Status. At the time of the visit, the tank was nearly filled. The tank is scheduled to be closed in July 1988. A machine-cleaning facility with hand-sprayed solvent units followed by bulk storage and reuse will replace the present operation. The used solvent will be periodically replaced with fresh solvent and recycled by an offpost contractor.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Wastewater from steam cleaning industrial plant equipment.

(2) Physical and Chemical Characteristics. The wastewater has been tested, and is high in lead.

(3) Migration and Dispersal Characteristics. Dissolved lead can migrate in the ground water.

(4) Toxicological Characteristics. The National Primary Drinking Water Regulations standard for lead is 0.05 mg/L.

d. Migration Pathways. If a leak developed in the tank, the soil and ground water would be affected.

e. Evidence of Release. None observed.

f. Exposure Potential. Very low, assuming that the tank is intact.

g. Recommendations for Sampling. None.

27. MAP LOCATION/SITE NUMBER. SEAD-28, SEAD-29, SEAD-30, SEAD-31, SEAD-32, SEAD-33, SEAD-34.

a. Unit Name. Waste Oil Tanks - Bldg 360, Bldg 732, Bldg 118, Bldg 117, Bldg 718, Bldg 121, Bldg 319.

b. Unit Characteristics.

(1) Unit Type. Underground waste oil storage tanks.

(2) Design Features.

TABLE C-3. Design Features of Underground Waste Oil Storage Tanks

SITE NUMBER	BLDG NUMBER	TANK ID	YEAR INSTALLED	CAPACITY (gallons)	TANK MATERIAL
SEAD-28	T-355	A	1981	2,130	fiberglass
		B	1981	2,130	fiberglass
SEAD-29	732		1981	550	fiberglass
SEAD-30	118		1981	550	fiberglass
SEAD-31	117		1981	2,130	fiberglass
SEAD-32	718	A	1956	40,000	steel
		B	1978	20,000	steel
SEAD-33	121		1943	30,000	steel
SEAD-34	319	A	1951	30,000	steel
		B	1951	20,000	steel

(3) Present Condition and Status. In use.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Waste oil.

(2) Migration and Dispersal Characteristics. Leakage of any tank would result in the waste oil floating on top of the ground-water table

d. Migration Pathways. Soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. Test older steel tanks for leakage.

28. MAP LOCATION/SITE NUMBER. SEAD-35, SEAD-36, SEAD-37.

a. Unit Name. Waste Oil-Burning Boilers - Bldg 718, Bldg 121, Bldg 319.

b. Unit Characteristics.

(1) Unit Type. Waste oil-burning boilers.

(2) Design Features.

TABLE C-4. Design Features of Waste Oil-burning Boilers

SITE NUMBER	BLDG NUMBER	BOILER NUMBER	CAPACITY RATING (MBtu/hr)	DATE INSTALLED	COMBUSTION RATE (gal/hr)
SEAD-35	718	A	10.0	1955	15.5
		B	10.0	1955	15.5
		C	10.0	1955	15.5
SEAD-36	121	A	6.6	1969	10.6
		B	6.6	1969	10.6
SEAD-37	319	A	12.0	1970	32.9
		B	16.1	1979	32 9

(3) Present Condition and Status. All boilers are functional except one at Bldg 121.

c. Waste Characteristics.

(1) Specific Wastes Disposed. Waste oil is burned as fuel for providing space heating and hot water production.

(2) Physical and Chemical Characteristics. The waste oil is sometimes high in lead content.

d. Migration Pathways. Air.

e. Evidence of Release. Permitted air emissions. No air pollution devices.

f. Exposure Potential. Moderate.

g. Recommendations for Sampling. None.

h. References. 10, 16, 22.

29. MAP LOCATION/SITE NUMBER. SEAD-38, SEAD-39, SEAD-40, SEAD-41.

a. Unit Name. Boiler Plant Blowdown Leach Pits - Bldg 2079, Bldg 121, Bldg 319, Bldg 718.

b. Unit Characteristics.

(1) Unit Type. Leach pits.

(2) Design Features. Unknown.

(3) Approximate Dates of Usage. From the time the boilers were used until the time when the blowdown points were linked to the sanitary sewer system (1979 or 1980).

(4) Operating Practices. The boilers discharged 400 to 800 gallons per day at the rate of three times every 24 hours. The flow drained partly in the ground and partly to nearby drainage ditches.

(5) Present Condition and Status. All blowdown points are currently connected to the sanitary sewer system. The old leaching areas were not visible.

c. Waste Characteristics.

(1) Specific Wastes Disposed. The boiler blowdown water probably contained tannins, caustic soda (sodium hydroxide), and sodium phosphate.

(2) Physical and Chemical Characteristics. Tannins are plant-derived phenolic compounds.

(3) Migration and Dispersal Characteristics. Any of the three constituents may migrate in the ground water.

(4) Toxicological Characteristics. Some tannins are carcinogenic by ingestion.

d. Migration Pathways. Soil, ground water.

e. Evidence of Release. None observed.

f. Exposure Potential. Low.

g. Recommendations for Sampling. None.

h. References. 6, 7, 11, 22.

APPENDIX D

REFERENCES

1. Public Law 94-580, 21 October 1976, Resource Conservation and Recovery Act, as amended by Public Law 98-616, 8 November 1984, Hazardous and Solid Waste Amendments (HSWA) of 1984.

2. Title 40, Code of Federal Regulations (CFR), 1987 rev, Section 264.101, Corrective Action for Solid Waste Management Units.

3. Proposed Rule, Contents of Part B: General Requirements, 52 Federal Register (FR) 45799, 1 December 1987.

4. Army Regulation 200-1, 15 June 1982, Environmental Protection and Enhancement.

5. Letter, U.S. Army Environmental Health Laboratory, MEDEI-E, 16 August 1960, subject: Disposal of IRFNA by Soil Absorption, Seneca Ordnance Depot (transmittal letter for Report of Sanitary Engineering Study No. 3642E4-60).

6. Letter, USAEHA, USAEHA-ES, 23 August 1971, subject: Water Quality Engineering Survey No. 24-023-71, Seneca Army Depot, Romulus, New York, 26-30 April 1971.

7. Letter, USAEHA, USAEHA-EW, 22 February 1974, subject: Water Quality Monitoring Consultation No. 24-024-74, Seneca Army Depot, Romulus, New York, 11-14 November 1973.

8. Letter, USAEHA, HSE-ES, 8 December 1975, subject: Solid Waste Survey No. 26-006-76, Seneca Army Depot, Romulus, New York, 29 September - 1 October 1975.

9. Installation Assessment of Seneca Army Depot, Report No 157, U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), January 1980.

10. Installation Environmental Assessment for Seneca Army Depot, prepared by Seneca Army Depot, 1 May 1980.

11. Letter, USAEHA, HSE-EW-S/WP, 14 October 1980, subject: Potable/ Recreational Water Quality Survey No. 31-24-0225-81 and Wastewater Engineering Survey No. 32-24-0226-81, Seneca Army Depot, Romulus, NY, 28 April - 2 May 1980.

12. Letter, Seneca Army Depot, SDSSE-AD, 13 November 1980, subject: Submittal of EPA Forms 3510-1 and 3510-3 for Interim status to treat, store, or dispose of hazardous wastes.

13. Letter, USAEHA, HSE-EW-A/WP, 14 July 1981, subject: Army Pollution Abatement Program Study No. D1671-W, Water Quality Engineering Special Study, Innovative Wetlands Wastewater Treatment Project, Seneca Army Depot, Romulus, NY, 21 July -1 August 1980 (USAEHA Control No. 81-24-8823-81).

14. Letter, USAEHA, HSE-ES/WP, 13 August 1981, subject: Final Report, Army Pollution Abatement Program Study No. D-1031-W, Landfill Leachate Study, Seneca Army Depot, Romulus, New York, 23 July - 3 August 1979 (USAEHA Control No. 81-26-8020-81).

15. Letter, USAEHA, HSE-EW/WP, 12 February 1982, subject: Phase 1, Water Quality Engineering Special Study No. 32-24-8832-82, APAP Compliance Test for MCA Project No. 60, Upgrade of Sewage Treatment Plant No. 715, Seneca Army Depot, Romulus, NY, 26-28 October 1981.

16. Letter, USAEHA, HSHB-MN-E, 5 November 1982, subject: Air Pollution Status and Evaluation Survey No. 44-61-0104-83, Seneca Army Depot, Romulus, New York, 23-26 August 1982.

17. Letter, USAEHA, HSHB-EW-A/WP, 3 December 1982, subject: Water Quality Engineering Special Study No. 32-24-8861-83, Innovative Wetlands Wastewater Treatment Project, Two-Year Evaluation, Seneca Army Depot, Romulus, NY, 19-30 July 1982.

18. Letter, USATHAMA, DRXTH-AS, 3 March 1983, subject: Installation Assessment of Seneca Army Depot, NY, Report No. 157.

19. Letter, USAEHA, HSHB-EW-M/WP, 12 July 1983, subject: Final Phase, Water Quality Engineering Special Study No. 32-24-8832-83, Compliance Test for MCA Project No. 60, Upgrade of Sewage Treatment Plant No. 715, Seneca Army Depot, Romulus, New York, 8-17 March 1983.

20. Draft Resource Conservation and Recovery Act Part B Permit Application, U.S. Army Seneca Army Depot, Romulus, New York, prepared for US Army Engineers Division, Huntsville by Fred C. Hart Associates, Inc., May 1984.

21. Letter, USAEHA, HSHB-ES-G, 28 October 1985, subject: Ground-Water Monitoring Study No. 38-26-0457-86, AMC Open Burning/Open Detonation Facilities, February 1984 - March 1985.

22. Audit Report, Seneca Army Depot (SEAD), Romulus, New York, Document No. HNDSP 86-166-ED-PM, prepared by PRC Engineering for U.S. Army Corps of Engineers, Huntsville Division, February 1987.

23. Memorandum, USAEHA, HSHB-ME-SE, 25 April 1988, subject: Geohydrologic Study No. 38-26-0313-88, Seneca Army Depot, Romulus, New York, 13-21 October 1987.

APPENDIX E

APPENDIX E

Drinking Water Regulations and Health Advisories,
April 1990

DRINKING WATER REGULATIONS

AND HEALTH ADVISORIES

by

Office of Water
U.S. Environmental Protection Agency
Washington, D.C.
202-260-7571

SAFE DRINKING WATER HOTLINE
1-800-426-4791
Monday thru Friday, 8:30 AM to 5:00 PM EST

May 1993

LEGEND

Abbreviations column descriptions are:

MCLG - Maximum Contaminant Level Goal. A non-enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.

MCL - Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

RfD - Reference Dose. An estimate of a daily exposure to the human population that is likely to be without appreciable risk of deleterious effects over a lifetime.

DWEL - Drinking Water Equivalent Level. A lifetime exposure concentration protective of adverse, non-cancer health effects, that assumes all of the exposure to a contaminant is from a drinking water source.

(*) The codes for the Status Reg and Status HA columns are as follows:

F - final
D - draft
L - listed for regulation
P - proposed
T - tentative

Other codes found in the table include the following:

NA - not applicable
PS - performance standard 0.5 NTU - 1.0 NTU
TT - treatment technique

** - No more than 5% of the samples per month may be positive. For systems collecting fewer than 40 samples/month, no more than 1 sample per month may be positive.

*** - guidance

- Large discrepancies between Lifetime and Longer-term HA values may occur because of the Agency's conservative policies, especially with regard to carcinogenicity, relative source contribution, and less than lifetime exposures in chronic toxicity testing. These factors can result in a cumulative UF (uncertainty factor) of 10 to 1000 when calculating a Lifetime HA.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
ORGANICS													
Acenaphthene	-	-	-	-	-	-	-	-	0.06	-	-		D
Acifluorfen	*T*	***zero***	-	F	2	2	0.1	0.4	0.013	0.4	-	0.1	B2
Acrylamide	F	zero	TT	F	1.5	0.3	0.02	0.07	0.0002	0.007	-	0.001	B2
Acrylonitrile	*T*	***zero***	-	D	-	-	-	-	-	-	-	0.006	B1*
Adipates (diethylhexyl)	P	0.5	0.5	-	-	-	-	-	0.7	20	0.5		C
Alachlor	F	zero	0.002	F	0.1	0.1	-	-	0.01	0.4	-	0.04	B2
Aldicarb	F	0.001	0.003	F	-	-	-	-	***0.001***	***0.035***	***0.007***		D
Aldicarb sulfone	F	0.001	0.002	F	-	-	-	-	***0.001***	***0.035***	***0.007***		D
Aldicarb sulfoxide	F	0.001	0.004	F	-	-	-	-	***0.001***	***0.035***	***0.007***		D
Aldrin	-	-	-	D	0.0003	0.0003	0.0003	0.0003	0.00003	0.001	-	0.0002	B2
Ametryn	-	-	-	F	9	9	0.9	3	0.009	0.3	0.06	-	D
Ammonium sulfamate	-	-	-	F	20	20	20	80	0.28	8	2	-	D
Anthracene (PAH)	-	-	-	-	-	-	-	-	0.3	-	-		D
Atrazine	F	0.003	0.003	F	0.1	0.1	0.05	0.2	***0.035***	0.2*	0.003*	-	C
Baygon	-	-	-	F	0.04	0.04	0.04	0.1	0.004	0.1	0.003	-	C
Bentazon	*T*	***0.02***	-	F	0.3	0.3	0.3	0.9	0.0025	0.09	0.02	-	D
Benz(a)anthracene (PAH)	P	zero	0.0001	-	-	-	-	-	-	-	-		B2
Benzene	F	zero	0.005	F	0.2	0.2	-	-	-	-	-	0.1	A
Benzo(a)pyrene (PAH)	F	zero	0.0002	-	-	-	-	-	-	-	-		B2*
Benzo(b)fluoranthene (PAH)	P	zero	0.0002	-	-	-	-	-	-	-	-		B2
Benzo(g,h,i)perylene (PAH)	-	-	-	-	-	-	-	-	-	-	-		D
Benzo(k)fluoranthene (PAH)	P	zero	0.0002	-	-	-	-	-	-	-	-		B2
bis-2-Chloroisopropyl ether	-	-	-	F	4	4	4	13	0.04	1	0.3		D
Bromacil	L	-	-	F	5	5	3	9	0.13	5	0.09	-	C
Bromobenzene	L	-	-	D	-	-	-	-	-				

* Under review.

NOTE: Anthracene and Benzo(g,h,i)perylene — not proposed in Phase V.

NOTE: Changes from the last version are noted in Italic and Bold Face print.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Bromochloroacetonitrile	L	-	-	D	-	-	-	-	-	-	-	-	-
Bromochloromethane	-	-	-	F	50	1	1	5	0.013	0.5	0.09	-	
Bromodichloromethane (THM)	*T*	*zero*	0.1*	D	7	7	4	13	0.02	0.7	-	0.06	B2
Bromoform (THM)	*T*	*zero*	0.1*	D	6	2	2	6	0.02	0.7	-	0.4	B2
Bromomethane	*T*	-	-	F	0.1	0.1	0.1	0.5	0.001	*0.04*	0.01	-	D
Butyl benzyl phthalate (PAE)	P	zero	0.1	-	-	-	-	-	0.2	6	-	-	C
Butylate	-	-	-	F	2	2	1	4	0.05	2	0.35	-	D
Butylbenzene n-	-	-	-	D	-	-	-	-	-	-	-	-	-
Butylbenzene sec-	-	-	-	D	-	-	-	-	-	-	-	-	
Butylbenzene tert-	-	-	-	D	-	-	-	-	-	-	-	-	-
Carbaryl	-	-	-	F	1	1	1	1	0.1	4	0.7	-	D
Carbofuran	F	0.04	0.04	F	0.05	0.05	0.05	0.2	0.005	0.2	0.04	-	E
Carbon tetrachloride	F	zero	0.005	F	4	0.2	0.07	0.3	0.0007	0.03	-	0.03	B2
Carboxin	-	-	-	F	1	1	1	4	0.1	4	0.7	-	D
Chloral hydrate	*T*	*0.06*	-	D	7	1.4	0.2	0.6	0.0002	0.07	0.06	-	C
Chloramben	-	-	-	F	3	3	0.2	0.5	0.015	0.5	0.1	-	D
Chlordane	F	zero	0.002	F	0.06	0.06	-	-	0.00006	0.002	-	0.003	B2
Chlorodibromomethane (THM)	*T*	*zero*	0.1*	D	7	7	2	8	0.02	0.7	0.06	-	C
Chloroethane	L	-	-	D	-	-	-	-	-	-	-	-	
Chloroform (THM)	*T*	*zero*	0.1*	D	4	4	0.1	0.4	0.01	0.4	-	0.6	B2
Chloromethane	L	-	-	F	9	0.4	0.4	1	0.004	0.1	0.003	-	C
Chlorophenol (2-)	-	-	-	D	0.05	0.05	0.05	0.2	0.005	0.2	0.04	-	D
p-Chlorophenyl methyl sulfide/sulfone/sulfoxide	-	-	-	**	-	-	-	-	-	-	-	-	D
Chloropicrin	L	-	-	-	-	-	-	-	-	-	-	-	-
Chlorothalonil	-	-	-	F	0.2	0.2	0.2	0.5	0.015	0.5		0.15	B2
Chlorotoluene o-	L	-	-	F	2	2	2	7	0.02	0.7	0.1	-	D
Chlorotoluene p-	L	-	-	F	2	2	2	7	0.02	0.7	0.1		D
Chlorpyrifos	-	-	-	D	0.03	0.03	0.03	0.1	0.003	0.1	0.02	-	D
Chrysene (PAH)	P	zero	0.0002	-	-	-	-	-					B2
Cyanazine	*T*	*0.001*	-	F	0.1	0.*	0.02	0.07	0.002	0.07	0.001		

* *Current M* NOTE: Chrysene was proposed in second option.

** A HA will not be developed due to insufficient data; a "Database Deficiency Report has been published.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Cyanogen chloride	L	-	-	-	-	-	-	-	-	-	-	-	-
Cymene p-	-	-	-	D	-	-	-	-	-	-	-	-	-
2,4-D	F	0.07	0.07	F	1	0.3	0.1	0.4	0.01	0.4	0.07	-	D
DCPA (Dacthal)	L	-	-	F	80	80	5	20	0.5	20	4	-	D
Dalapon	F	0.2	0.2	F	3	3	0.3	0.9	0.026	0.9	0.2	-	D
Di[2-ethylhexyl]adipate	F	0.4	0.4	-	20	20	20	60	0.6	20	0.4	3	C
Diazinon	-	-	-	F	0.02	0.02	0.005	0.02	0.00009	0.003	0.0006	-	E
Dibenz(a,h)anthracene (PAH)	P	zero	0.0003	-	-	-	-	-	-	-	-	-	B2
Dibromoacetonitrile	L	-	-	D	2	2	2	8	0.02	0.8	0.02	-	C
Dibromochloropropane (DBCP)	F	zero	0.0002	F	0.2	0.05	-	-	-	-	-	0.003	B2
Dibromomethane	L	-	-	-	-	-	-	-	-	-	-	-	D
Dibutyl phthalate (PAE)	-	-	-	-	-	-	-	-	0.1	4	-	-	D
Dicamba	L	-	-	F	0.3	0.3	0.3	1	0.03	1	0.2	-	D
Dichloroacetaldehyde	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloroacetic acid	T	zero	-	D	-	50	5	20	0.008	0.3	-	-	B2
Dichloroacetonitrile	L	-	-	D	1	1	0.8	3	0.008	0.3	0.006	-	C
Dichlorobenzene o-	F	0.6	0.6	F	9	9	9	30	0.09	3	0.6	-	D
Dichlorobenzene m- *	F	0.6	0.6	F	9	9	9	30	0.09	3	0.6	-	D
Dichlorobenzene p-	F	0.075	0.075	F	10	10	10	40	0.1	4	0.075	-	C
Dichlorodifluoromethane	L	-	-	F	40	40	9	30	0.2	5	1	-	D
Dichloroethane (1,1-)	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloroethane (1,2-)	F	zero	0.005	F	0.7	0.7	0.7	2.6	-	-	-	0.04	B2
Dichloroethylene (1,1-)	F	0.007	0.007	F	2	1	1	4	0.009	0.4	0.007	-	C
Dichloroethylene (cis-1,2-)	F	0.07	0.07	F	4	3	3	11	0.01	0.4	0.07	-	D
Dichloroethylene (trans-1,2-)	F	0.1	0.1	F	20	2	2	6	0.02	0.6	0.1	-	D
Dichloromethane	F	zero	0.005	F	10	2	-	-	0.06	2	-	0.5	B2
Dichlorophenol (2,4-)	-	-	-	D	0.03	0.03	0.03	0.1	0.003	0.1	0.02	-	D
Dichloropropane (1,1-)	-	-	-	D	-	-	-	-	-	-	-	-	-
Dichloropropane (1,2-)	F	zero	0.005	F	-	0.09	-	-	-	-	-	0.05	B2
Dichloropropane (1,3-)	L	-	-	D	-	-	-	-	-	-	-	-	-

* The values for m-dichlorobenzene are based on data for o-dichlorobenzene.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Dichloropropane (2,2-)	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloropropene (1,1-)	L	-	-	D	-	-	-	-	-	-	-	-	-
Dichloropropene (1,3-)	*T*	*zero*	-	F	0.03	0.03	0.03	0.1	0.0003	0.01	-	0.02	B2
Dieldrin	-	-	-	F	0.0005	0.0005	0.0005	0.002	0.00005	0.002	-	0.0002	B2
Diethyl phthalate (PAE)	-	-	-	D	-	-	-	-	0.8	30	5	-	D
Diethylene glycol dinitrate	-	-	-	**	-	-	-	-	-	-	-	-	-
Diethylhexyl phthalate (PAE)	F	zero	0.006	D	-	-	-	-	0.02	0.7	-	0.3	B2*
Diisopropyl methylphosphonate	-	-	-	F	8	8	8	30	0.08	3	0.6	-	D
Dimethrin	-	-	-	F	10	10	10	40	0.3	10	2	-	D
Dimethyl methylphosphonate	-	-	-	F	2	2	2	6	0.2	7	0.1	0.7	C
Dimethyl phthalate (PAE)	-	-	-	-	-	-	-	-	-	-	-	-	D
1,3-Dinitrobenzene	-	-	-	F	0.04	0.04	0.04	0.14	0.0001	0.005	0.001	-	D
Dinitrotoluene (2,4-)	L	-	-	F	0.50	0.50	0.30	1	0.002	0.1	-	-	-
Dinitrotoluene (2,6-)	L	-	-	F	0.40	0.40	0.40	1	0.001	0.04	-	-	-
tg 2,6 & 2,4 dinitrotoluene ***	-	-	-	-	-	-	-	-	-	-	-	*0.005*	*B2*
Dinoseb	F	0.007	0.007	F	0.3	0.3	0.01	0.04	0.001	0.04	0.007	-	D
Dioxane p-	-	-	-	F	4	0.4	-	-	-	-	-	0.7	B2
Diphenamid	-	-	-	F	0.3	0.3	0.3	1	0.03	1	0.2	-	D
Diphenylamine	-	-	-	F	1	1	0.3	1	0.03	1	0.2		D
Diquat	F	0.02	0.02	-	-	-	-	-	0.0022	0.08	0.02	-	D
Disulfoton	-	-	-	F	0.01	0.01	0.003	0.009	0.00004	0.001	0.0003	-	E
Dithiane (1,4-)	-	-	-	F	0.4	0.4	0.4	1	0.01	0.4	0.08	-	D
Diuron	-	-	-	F	1	1	0.3	0.9	0.002	0.07	0.01	-	D
Endothall	F	0.1	0.1	F	0.8	0.8	0.2	0.2	0.02	0.7	0.1	-	D
Endrin	F	0.002	0.002	F	0.02	0.02	0.003	0.01	0.0003	0.01	0.002	-	D
Epichlorohydrin	F	zero	TT	F	0.1	0.1	0.07	0.07	0.002	0.07	-	0.4	B2
Ethylbenzene	F	0.7	0.7	F	30	3	1	3	0.1	3	0.7	-	D
Ethylene dibromide (EDB)	F	zero	0.00005	F	0.008	0.008	-	-	-	-	-	0.00004	B2
Ethylene glycol				F	20	6	6	20	2	40	7		D
ETU	L	-	-	F	0.3		0.1	0.4	0.00008	0.003		0.03	32
Fenamiphos	-	-	-	F	0.009	0.009	0.005	0.02	0.00025	0.009	0.002		D

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Fluometron	-	-	-	F	2	2	2	5	0.013	0.4	0.09		D
Fluorene (PAH)	-	-	-	-	-	-	-	-	0.04	-	-		D
Fluorotrichloromethane	L	-	-	F	7	7	3	10	0.3	10	2		D
Fog Oil	-	-	-	D	-	-	-	-	-	-	-		-
Fonofos	-	-	-	F	0.02	0.02	0.02	0.07	0.002	0.07	0.01	-	D
Formaldehyde	-	-	-	D	10	5	5	20	0.15	5	1	-	B1
Gasoline, unleaded (benzene)	-	-	-	D	-	-	-	-	-	-	0.005	-	-
Glyphosate	F	0.7	0.7	F	20	20	1	1	0.1	4	0.7	-	D
Heptachlor	F	zero	0.0004	F	0.01	0.01	0.005	0.005	0.0005	0.02	-	0.0008	B2
Heptachlor epoxide	F	zero	0.0002	F	0.01	-	0.0001	0.0001	1.3E-0.5	0.0004	-	0.0004	B2
Hexachlorobenzene	F	zero	0.001	F	0.05	0.05	0.05	0.2	0.0008	0.03	-	0.002	B2
Hexachlorobutadiene	*T*	*0.001*	-	F	0.3	0.3	0.1	0.4	0.002	0.07	0.001	-	C
Hexachlorocyclopentadiene	F	0.05	0.06	-	-	-	-	-	0.007	0.2	-	-	D
Hexachloroethane	L	-	-	F	5	5	0.1	0.5	0.001	0.04	0.001	-	C
Hexane (n-)	-	-	-	F	10	4	4	10	-	-	-	-	D
Hexazinone	-	-	-	F	3	3	3	9	0.033	1	0.2	-	D
HMX	-	-	-	F	5	5	5	20	0.05	2	0.4	-	D
Indeno(1,2,3,-c,d)pyrene (PAH)	P	zero	0.0004	D	-	-	-	-	-	-	-	-	B2
Isophorone	L	-	-	F	15	15	15	15	0.2	7	0.1	4	C
Isopropyl methylphosphonate	-	-	-	D	30	30	30	100	0.1	4.0	0.7	-	D
Isopropylbenzene	-	-	-	D	-	-	-	-	-	-	-	-	-
Lindane	F	0.0002	0.0002	F	1	1	0.03	0.1	0.0003	0.01	0.0002	-	C
Malathion	-	-	-	D	0.2	0.2	0.2	0.8	0.02	0.8	0.2	-	D
Maleic hydrazide	-	-	-	F	10	10	5	20	0.5	20	4	-	D
MCPA	-	-	-	F	0.1	0.1	0.1	0.4	0.0015	0.05	0.01	-	E
Methomyl	L	-	-	F	0.3	0.3	0.3	0.3	0.025	0.9	0.2	-	D
Methoxychlor	F	0.04	0.04	F	0.05	0.05	0.05	0.2	0.005	0.2	0.04		D
Methyl ethyl ketone	-	-	-	-									*
Methyl parathion	-	-	-	F	0.3	0.3	0.03	0.1	0.00025	0.009	0.002	-	D

* Under review.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Methyl tert butyl ether	L	-	-	D	3	3	0.5	2	0.005	0.2	0.04	-	D
Metolachlor	L	-	-	F	2	2	2	5	0.15	5	0.1	-	C
Metribuzin	L	-	-	F	5	5	0.3	0.9	0.025	0.9	0.2		D
Monochloroacetic acid	L	-	-	D	-	-	-	-	-	-	-	-	
Monochlorobenzene	F	0.1	0.1	F	2	2	2	7	0.02	0.7	0.1		D
Naphthalene	-	-	-	F	0.5	0.5	0.4	1	0.004	0.1	0.02	-	D
Nitrocellulose (non-toxic)	-	-	-	F	-	-	-	-	-	-	-	-	
Nitroguanidine	-	-	-	F	10	10	10	40	0.1	4	0.7	-	D
Nitrophenols p-	-	-	-	D	0.8	0.8	0.8	3	0.008	0.3	0.06		D
Oxamyl (Vydate)	F	0.2	0.2	F	0.2	0.2	0.2	0.9	0.025	0.9	0.2	-	E
Paraquat	-	-	-	F	0.1	0.1	0.05	0.2	0.0045	0.2	0.03	-	E
Pentachloroethane	-	-	-	D	-	-	-	-	-	-	-	-	
Pentachlorophenol	F	zero	0.001	F	1	0.3	0.3	1	0.03	1	-	0.03	B2
Phenanthrene (PAH)	-	-	-	-	-	-	-	-	-	-	-	-	
Phenol	-	-	-	D	6	6	6	20	0.6	20	4	-	D
Picloram	F	0.5	0.5	F	20	20	0.7	2	0.07	2	0.5	-	D
Polychlorinated biphenyls (PCBs)	F	zero	0.0005	P	-	-	-	-	-	-	-	0.0005	B2
Prometon	L	-	-	F	0.2	0.2	0.2	0.5	0.015*	0.5*	0.1*	-	D
Pronamide	-	-	-	F	0.8	0.8	0.8	3	0.075	3	0.05	-	C
Propachlor	-	-	-	F	0.5	0.5	0.1	0.5	0.013	0.5	0.09	-	D
Propazine	-	-	-	F	1	1	0.5	2	0.02	0.7	0.01	-	C
Propham	-	-	-	F	5	5	5	20	0.02	0.6	0.1	-	D
Propylbenzene n-	-	-	-	D	-	-	-	-	-	-		-	
Pyrene (PAH)	-	-	-	-	-	-	-	-	0.03	-		-	D
RDX	-	-	-	F	0.1	0.1	0.1	0.4	0.003	0.1	0.002	0.03	C
Simazine	F	0.004	0.004	F	0.07	0.07	0.07	0.07	0.005	0.2	0.004	-	C
Styrene	F	0.1	0.1	F	20	2	2	7	0.2	7	0.1	-	C
2,4,5-T	L	-	-	F	0.8	0.8	0.8	1	0.01	0.35	0.07	-	D
2,3,7,8-TCDD (Dioxin)	F	zero	3E-08	F	1E-06	1E-07	1E-08	4E-08	1E-09	4E-08		2E-08	B2

* Under review. NOTE: Phenanthrene — not proposed.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Tebuthiuron	-	-	-	F	3	3	0.7	2	0.07	2	0.5	-	D
Terbacil	-	-	-	F	0.3	0.3	0.3	0.9	0.013	0.4	0.09	-	E
Terbufos	-	-	-	F	0.005	0.005	0.001	0.005	0.00013	0.005	0.0009	-	D
Tetrachloroethane (1,1,1,2-)	L	-	-	F	2	2	0.9	3	0.03	1	0.07	0.1	C
Tetrachloroethane (1,1,2,2-)	L	-	-	D	-	-	-	-	-	-	-	-	
Tetrachloroethylene	F	zero	0.005	F	2	2	1	5	0.01	0.6	-	0.07	
Tetranitromethane	-	-	-	**	-	-	-	-	-	-	-	-	
Toluene	F	1	1	F	20	2	2	7	0.2	7	1	-	D
Toxaphene	F	zero	0.003	F	0.5	0.04	-	-	0.1	0.0035	-	0.003	B2
2,4,5-TP	F	0.05	0.05	F	0.2	0.2	0.07	0.3	0.0075	0.3	0.05	-	D
1,1,2-Trichloro 1,2,2-trifluoroethane	-	-	-	-	-	-	-	-	-	-	-	-	
Trichloroacetic acid	*T*	*0.1*	-	D	-	2	4	13	0.04	1.3	1	-	C
Trichloroacetonitrile	L	-	-	D	0.05	0.05	-	-	-	-	-	-	
Trichlorobenzene (1,2,4-)	F	0.07	0.07	F	0.1	0.1	0.1	0.5	0.01	0.4	0.07	-	D
Trichlorobenzene (1,3,5-)	-	-	-	F	0.6	0.6	0.6	2	0.006	0.2	0.04	-	D
Trichloroethane (1,1,1-)	F	0.2	0.2	F	100	40	40	100	0.035	1	0.2	-	D
Trichloroethane (1,1,2-)	F	0.003	0.005	F	0.6	0.4	0.4	1	0.004	0.1	0.003	-	C
Trichloroethanol (2,2,2-)	L	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	F	zero	0.005	F	-	-	-	-	-	0.3	-	0.3	B2
Trichlorophenol (2,4,6-)	L	-	-	D	-	-	-	-	-	-	-	0.3	B2
Trichloropropane (1,1,1-)	-	-	-	D	-	-	-	-	-	-	-		
Trichloropropane (1,2,3-)	L	-	-	F	0.6	0.6	0.6	2	0.006	0.2	0.04		B2
Trifluralin	L	-	-	F	0.08	0.08	0.08	0.3	0.0075	0.3	0.005	-	C
Trimethylbenzene (1,2,4-)	-	-	-	D	-	-	-	-	-	-	-	-	-
Trimethylbenzene (1,3,5-)	-	-	-	D	-	-	-	-	-	-	-	-	
Trinitroglycerol	-	-	-	F	0.005	0.005	0.005	0.005	-	-	0.005	-	
Trinitrotoluene				F	0.02	0.02	0.02	0.02	0.0005	0.02	0.002	0.1	C
Vinyl chloride	F	zero	0.002	F	3	3	0.01	0.05	-	-	-	0.0015	A
Xylenes	F	10	10	F	40	40	40	100	2	60	10	-	D

** A HA will not be developed due to insufficient data; a "Database Deficiency Report" has been published.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
INORGANICS													
Aluminum	L	-	-	D	-	-	-	-	-	-	-	-	
Ammonia	-	-	-	D	-	-	-	-	-	-	30	-	D
Antimony	F	0.006	0.006	F	0.015	0.015	0.015	0.015	0.0004	0.015	0.003		D
Arsenic	*	-	0.05	D	-	-	-	-	-	-	-	0.002	A
Asbestos (fibers/l >10μm length)	F	7 MFL	7 MFL	-	-	-	-	-	-	-	-	700 MFL	A
Barium	F	2	2	F	-	-	-	-	0.07	2	2		D
Beryllium	F	0.004	0.004	D	30	30	4	20	0.005	0.2	-	0.0008	B2
Boron	L	-	-	D	4	0.9	0.9	3	0.09	3	0.6	*	*D*
Cadmium	F	0.005	0.005	F	0.04	0.04	0.005	0.02	0.0005	0.02	0.005		D
Chloramine	*T*	*4*	-	D	1	1	1	1	0.1	3.3	2.6	-	
Chlorate	L	-	-	D	-	-	-	-	-	-	-		
Chlorine	*T*	*4*	-	D	-	-	-	-	-	-	-	-	*D*
Chlorine dioxide	*T*	*0.08*	-	D	-	-	-	-	*0.003*	*0.1*	*0.08*	-	*D*
Chlorite	L	-	-	D	-	-	-	-	-	-	-	-	*D*
Chromium (total)	F	0.1	0.1	F	1	1	0.2	0.8	0.005	0.2	0.1	-	D
Copper	F	1.3	TT**	-	-	-	-	-	-	-	-	-	D
Cyanide	P	0.2	0.2	F	0.2	0.2	0.2	0.8	0.022	0.8	0.2	-	D
Fluoride*	F	4	4	-	-	-	-	-	0.12	-	-	-	-
Hypochlorite	*T*	*4*	-	-	-	-	-	-	-	-	-	-	
Hypochlorous acid	*T*	*4*	-	-	-	-	-	-	-	-	-	-	
Lead (at tap)	F	zero	TT**	-	-	-	-	-	-	-	-	-	B2
Manganese	L	0.2	-	D	-	-	-	-	0.14/0.005	-	-	-	
Mercury (inorganic)	F	0.002	0.002	F	-	-	-	0.002	0.0003	0.01	0.002		D
Molybdenum	L	-	-	F	-	0.08	0.01	0.05	0.005	0.2	0.04	-	D
Nickel	F	0.1	0.1	F	1	1	0.5	1.7	0.02	0.6	0.1		D
Nitrate (as N)	F	10	10	F	-	10*	-		1.6				-

* Under revi...

** Copper ...ion level 1.3 mg/L

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA	Health Advisories								Cancer Group
					10-kg Child			70-kg Adult					
	Status Reg.	MCLG (mg/l)	MCL (mg/l)		One-day (mg/l)	Ten-day (mg/l)	Longer-term (mg/l)	Longer-term (mg/l)	RfD (mg/kg/day)	DWEL (mg/l)	Lifetime (mg/l)	mg/l at 10^{-4} Cancer Risk	
Nitrite (as N)	F	1	1	F	-	1*	-	-	0.16*	-	-	-	*
Nitrate + Nitrite (both as N)	F	10	10	F	-	-	-	-	-	-	-	-	*
Selenium	F	0.05	0.05	-	-	-	-	-	0.005	-	-	-	
Silver	-	-	-	D	0.2	0.2	0.2	0.2	0.005	0.2	0.1	-	D
Sodium	-	-	-	D	-	-	-	-	-	20***			
Strontium	L	-	-	D	25	25	25	90	*0.6*	90	17	-	D
Sulfate	P	**	**	-	-	-	-	-	-	-			
Thallium	F	0.0005	0.002	F	0.007	0.007	0.007	0.02	0.00007	0.002	0.0004		
Vanadium	L	-	-	D	-	-	-	-	-	-	-		D
White phosphorous	-	-	-	F	-	-	-	-	0.00002	0.0005	0.0001		D
Zinc	L	-	-	F	6	6	3	12	0.3	11	2	-	D
Zinc chloride (measured as Zinc)	L	-	-	F	6	6	3	12	0.3	11	2	-	D
RADIONUCLIDES													
Beta particle and photon activity (formerly man-made radionuclides)	*P*	zero	4 mrem	-	-	-	-	-	-	-	-	4 mrem/y	A
Gross alpha particle activity	*P*	zero	15 pCi/L	-	-	-	-	-	-	-	-	*15 pCi/L*	A
Radium 226	P	zero	20 pCi/L	-	-	-	-	-	-	-	-	*20 pCi/L*	A
Radium 228	P	zero	20 pCi/L	-	-	-	-	-	-	-	-	*20 pCi/L*	A
Radon	P	zero	300 pCi/L	-	-	-	-	-	-	-	-	*150 pCi/L*	A
Uranium	P	*30 µg/L*	20 µg/L	-	-	-	-	-	-	-	-	*70 µg/L*	A

* Under review.

** Deferred.

*** Guidance.

Secondary Maximum Contaminant Levels

Chemicals	Status	SMCLs (mg/L)
Aluminum	F	0.05 to 0.2
Chloride	F	250
Color	F	15 color units
Copper	F	1.0
Corrosivity	F	non-corrosive
Fluoride*	F	2.0
Foaming agents	F	0.5
Iron	F	0.3
Manganese	F	0.05
Odor	F	3 threshold odor numbers
pH	F	6.5 – 8.5
Silver	F	0.1
Sulfate	F	250
Total dissolved solids (TDS)	F	500
Zinc	F	5

Status Codes: P – proposed, F – final

* Under review.

Microbiology

	Status	MCLG	MCL
Cryptosporidium	L	-	-
Giardia lamblia	F	zero	TT
Legionella	F[β]	zero	TT
Standard Plate Count	F[β]	NA	TT
Total Coliforms (after 12/31/90)	F	zero	**
Turbidity (after 12/31/90)	F	NA	PS
Viruses	F[β]	zero	TT

Key: PS, TT, F, defined as previously stated.

β Final for systems using surface water; also being considered for regulation under groundwater disinfection rule.

APPENDIX F

APPENDIX F

AEHA Guidance for Interpreting Explosive Compounds in Groundwater Samples, October 12, 1990

APPENDIX F

AEHA GUIDANCE FOR INTERPRETING EXPLOSIVE COMPOUNDS IN GROUNDWATER SAMPLES, OCTOBER 12, 1990

HSHB-ME-SG (40)

MEMORANDUM FOR RECORD 12 Oct 90

SUBJECT: Guidance to Program 38 Project Officers on Interpretation of Explosive Compounds in Ground-water Samples

1. I encourage Program 38 personnel to use the following guidance to interpret explosive compounds in ground-water (non-drinking water) samples. All concentrations are in ug/L.

Parameter	Detection Limit	Lifetime Chronic Toxicity Threshhold	Carcinogenic Status	10^{-5} Carcinogenic Risk
RDX	1	2*	Class C (possible carcinogen)	3*
TNT	1	2*	Class C	10*
2,4 DNT	1	-	Recom.Class C by USAMBRDL	1.1**
2,6 DNT	0.05	-	Recom.Class C by USAMBRDL	0.0683***
HMX	100	400*	Class D (non-carcinogen)	-

* Based on EPA Health Advisories.
** Based on 1980 Water Quality Criteria Document.
*** Based on USAMBRDL guidance.

2. If aquatic organisms are threatened, look for USAMBRDL guidance (e.g., 103 ug/L for RDX). Note that 2,4 DNT is the only compound which may eventually get an MCL.

JOHN W. BAUER
Chief, Ground Water and Solid Waste Branch
Waste Disposal Engineering Division

AMSDS-CO

DEPARTMENT OF THE ARMY
OFFICE OF THE SURGEON GENERAL
5109 LEESBURG PIKE
FALLS CHURCH, VA 22041-3258

REPLY TO ATTENTION OF

JAN 7 1992

SGPS-PSP-E (40-5)

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Drinking Water Health Advisories for Army Chemicals

1. Reference Memorandum of Understanding Between the Department of the Army and the Environmental Protection Agency on Development of Drinking Water Health Advisories for Army Environmental Contaminants, 3 March 1991.

2. The referenced Memorandum of Understanding between the Army and the Environmental Protection Agency (EPA) has facilitated the development of EPA Drinking Water Health Advisories (HA) for selected Army munition contaminants. Each Advisory contains health effects guidelines, describes analytical methods, and recommends treatment techniques for a specific Army munition chemical contaminant. Each HA identifies levels of the contaminant in drinking water over specified exposure durations at which adverse effects are not expected to occur. Each advisory also defines an EPA verified oral reference dose (RfD). The RfD is an estimate of daily exposure by all ingestion sources (i.e. water and food) that is likely to be without appreciable risk of deleterious health effects, even in sensitive populations, over a lifetime.

3. To date HA's have been prepared by EPA for 10 chemicals (list is at enclosure one). Summary Profiles of these HA's are in enclosures 2-11. The complete HA's are available from the National Technical Information Service (see enclosure 12). Limited quantities of the health Advisories may be obtained by calling the EPA "Safe Drinking Water Hotline" at 1-800-426-4791. Complete sets may be may be obtained from the National Technical Information Service (see enclosure 12).

4. This office has received the ten Health Advisories issued to date and endorse them for your guidance and use as appropriate.

5. The points of contact for the Office of the Surgeon General are COL Fitz or MAJ Bratt, DSN 289-0125. Specific technical inquiries may be referred to MAJ Welford C. Roberts, EPA Office of Water, commercial (202) 260-7589 or Dr. Howard Bausam, U.S. Army Biomedical Research and Development Laboratory, DSN 343-2014, commercial (301) 663-2014.

SGPS-PSP-E (40-5)
SUBJECT: Drinking Water Health Advisories for Army Chemicals

FOR THE SURGEON GENERAL:

Frederick Robinson Col MC

12 Encls

for RONALD R. BLANCK
Brigadier General, Medical Corps
Director, Professional Services

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CMDT, AHS, ATTN: HSHA-IPM
DIR, WRAIR, ATTN: SGRD-UWK
USUHS, ATTN: DEPT of PVNT MED

MUNI NS DRINKING WATER HEALTH ADVISORIES

Title	NTIS Accession Number
p-Chlorophenyl methyl sulfide, -sulfoxide, -sulfone (PCPMS, PCPMSO, PCPMSO2)*	PB93-116986
Diethylene glycol dinitrate (DEGDN)*	PB93-117000
Diisopropyl Methylphosphonate (DIMP)	PB90-273517
Dimethyl Methylphosphonate (DMMP)	PB93-117018
1,3-Dinitrobenzene (DNB)	PB91-159640
2,4- and 2,6-Dinitrotoluene (2,4-/2,6-DNT)	PB92-189315
Diphenylamine (DPA)	PB93-116978
1,4-Dithiane	PB93-117026
Hexachloroethane (HCE)	PB91-159657
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	PB90-273533
Isopropyl Methylphosphonic acid (IMPA)	PB92-232149
Nitrocellulose (NC)	PB90-273541
Nitroguanidine (NQ)	PB90-273509
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	PB90-273525
Tetranitromethane (TNM)*	PB93-116994
Trinitroglycerol (TNG)	PB90-273558
Trinitrotoluene (TNT)	PB90-273566
White Phosphorous (WP)	PB91-161026
Zinc Chloride	PB93-136620

* Data Deficiency Report

United States
Environmental Protection Agency
Washington, DC 20460

United States
Environmental Protection
Agency

December 1992

Office of Water | Office of Science and Technology

EPA

Drinking Water Health Advisories for Munitions And Other Military Chemicals

HEALTH ADVISORIES

Health Advisories are U.S. Environmental Protection Agency (EPA) documents that provide advice on levels of contaminants in drinking water at which adverse health effects would not be anticipated. These contaminant levels include a margin of safety intended to protect even the most sensitive members of a population at risk such as infants or the elderly. Health Advisories provide health effects information, analytical methods for estimation of contaminants in water, and recommended treatment techniques to eliminate or minimize the contamination. Health Advisory levels are provided for one-day, ten-day, longer-term (up to 7 years) and lifetime exposure periods.

Health Advisories do not condone the presence of a contaminant in drinking water. They are not official regulations, and they may or may not lead ultimately to the issuance of national standards. EPA's evaluations and advisories may change as additional information becomes available.

THE ARMY AND EPA

The Department of the Army is a manufacturer of munitions chemicals, a user of toxic materials, and a supplier of drinking water. Since 1985, EPA and the Army have worked together to develop Health Advisories on munitions and other military chemicals that may be found as contaminants in drinking water.

INFORMATION IN HEALTH ADVISORIES

Each munitions Health Advisory summarizes pertinent data and presents an analysis of the health and toxicological studies used to formulate the recommended Advisory levels. The information includes:

- An Introduction
- General Information and Properties
- Sources of Exposure
- Environmental Fate
- Pharmacokinetics/Toxicokinetics
- Health Effects
- Health Advisory Development
- Other Criteria, Guidance, & Standards
- Analytical Methods
- Treatment Technologies
- Conclusions
- References
- Data Deficiencies

DATA DEFICIENCY REPORTS

When the available data for a munitions/military chemicals are not sufficient to develop a drinking water Health Advisory, a Data Deficiency report for that chemical is prepared. The report identifies the areas in which data are lacking and recommends research that will enhance and optimize the data base. When the recommended research has been conducted, it is expected that the data will allow the development of a Health Advisory.

ORDERING COPIES OF HEALTH ADVISORIES

Health Advisories are available from:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650

A list of munitions/military chemicals for which Health Advisories are available is included in this brochure. NTIS Accession Numbers are provided.

EMERGENCY PROFILES

The Department of the Army and the U.S. Environmental Protection Agency have developed "Profiles of Drinking Water Contaminants for Emergency Response." These profiles, based on drinking water Health Advisories, were created to provide quick information on the chemical properties and health effects of munitions/military chemicals that may occur as contaminants in drinking water.

FOR FURTHER INFORMATION

Contact the EPA Safe Drinking Water Hotline at 1-800-426-4791.

DIISOPROPYL METHYLPHOSPHONATE (DIMP)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Diisopropyl methylphosphonate (DIMP) is a stable by-product or contaminant in the effluent from the manufacture of the military nerve gas isopropyl methylphosphonofluoridate (GB). DIMP constitutes about 2-3% of crude GB.

In the United States, active production of GB-containing DIMP occurred between 1953 and 1957 at the Rocky Mountain Arsenal in Colorado where it was subsequently stored. Remaining stockpiles of GB are mandated for destruction by 1994.

DIMP that was disposed of in surface ponds at the Arsenal has contaminated ground water and is known to accumulate in plants. In water, DIMP is stable for over 2 years and is not affected by photolysis, biodegradation, or volatilization. In soil, it readily migrates with water. Biotransformation in soil is slow. DIMP is not likely to enter the atmosphere due to its low volatility.

PHARMACOKINETICS

DIMP is readily absorbed following oral administration to mice, rats, and dogs and is widely distributed throughout the body. Greater than 90% of the radiolabeled compound is excreted in urine. One major metabolite, isopropyl methyl phosphonic acid, accounts for 95% of the excreted compound.

HEALTH EFFECTS

Humans

No data are available on the potential systemic human health effects of exposure to DIMP. A skin sensitization test performed on 215 volunteers showed no allergic dermatitis.

HEALTH EFFECTS

Experimental Animals

Acute toxicity studies in a variety of species indicate that DIMP acts on the central nervous system to produce ataxia, copious salivation, lethargy, and coma. Cattle showed additional signs of cerebral edema and encephalitis.

DIMP is a significant eye irritant in rabbits, but upon dermal application, it produces only minimal skin irritation. In guinea pigs, DIMP was not found to be a skin sensitizer following dermal application.

Studies in mink and dogs fed DIMP for 21 days or less showed no DIMP toxicity.

Blood, intestinal, and ophthalmological changes seen in rats, mice, or dogs fed DIMP for 90 days were not clearly related to DIMP toxicity.

In a three-generation drinking water study with rats, decreases in the viability ratio and lactation viability of pups were observed. No other reproductive or developmental effects were found.

Lifetime toxicity and carcinogenicity data are not available.

No mutagenic effects were seen in *in vitro* bacterial assays.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

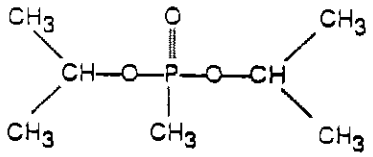
In 1984, the U.S. Army Medical Bioengineering Research and Development Laboratory recommended an interim limit for DIMP of 26.3 mg/L in drinking water.

Methods for the analysis of DIMP include gas chromatography with a flame photometric phosphorus detector, infrared and Raman spectroscopy, thin layer and paper chromatography, nuclear magnetic resonance spectroscopy, and field ionization mass spectrometry. Gas chromatography using a flame photometric phosphorus detector is considered the method of choice.

No data on treatment technologies were found although adsorption by activated carbon and several synthetic sorbents appear feasible.

Physical and Chemical Properties

Empirical Formula	$C_7H_{17}O_3P$
Synonyms	DIMP, Diisopropyl methylphosphonate, Diisopropyl methanephosphonate, Phosphonic acid, Methyl-, bis-(1-methyl-ethyl) ester, Phosphonic acid, Methyl diisopropyl ester
CAS Number	1445-75-6
Physical State	Colorless liquid
Molecular Weight	180.18
Boiling Point	174°C
Liquid Density	0.976 g/cm3 at 25°C
Vapor Pressure	77 mm Hg at 10°C; 122 mm Hg at 100°C
Solubility (at 25°C)	In water: 1-2 g/L at 25°C and >11 g/L at >80°C.



Health Effects Data and Advisory Values

Genotoxicity	DIMP did not induce genetic effects in *Salmonella* and *Saccharomyces cerevisiae* assays with or without activation.	
Reproductive and Developmental Effects	A significant decrease in the viability ratio of F_{3a} rat pups and in the lactation viability of F_{3b} pups were observed in a three-generation drinking water study with Sprague-Dawley rats. No other reproductive or developmental effects were found. The results of a mink study were considered inconclusive.	
Cancer Classification	EPA Group D, not classifiable as to human carcinogenicity.	
Reference Dose (RfD)	0.08 mg/kg/day	
Drinking Water Equivalent Level (DWEL)	3 mg/L	
Health Advisory Values	One-Day	8 mg/L
	Ten-Day	8 mg/L
	Longer-Term (child)	8 mg/L
	Longer-Term (adult)	30 mg/L
	Lifetime	0.6 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

Office of Science and Technology
Office of Water
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

June 17, 1991

DIMETHYL METHYLPHOSPHONATE (DMMP)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Dimethyl methylphosphonate (DMMP) is a water soluble, colorless liquid with high volatility.

Commercially, DMMP is used in the formulation of resins, latex, coatings, and flame retardants. The military uses DMMP to simulate nerve agents for testing chemical agent detection equipment and techniques.

Near Denver, Colorado, DMMP has been detected in groundwater at concentrations ranging from 6.5 µg/L to 1,300 µg/L.

Although the major fate of DMMP in soil and water is volatilization, DMMP is subject to hydrolysis, ultraviolet photolysis, and biodegradation. DMMP is resistant to oxidation.

PHARMACOKINETICS

No information is available on the absorption, distribution, metabolism, or excretion of DMMP.

However, oral toxicity studies indicate that DMMP is absorbed from the gastrointestinal tract.

HEALTH EFFECTS

Humans

A skin sensitization test performed on 50 subjects showed DMMP in an aqueous solution to be a moderate irritant at a 20% concentration and a mild irritant at a 10% level. DMMP was classified as a non-skin sensitizer.

HEALTH EFFECTS

Experimental Animals

DMMP is a mild skin and ocular irritant but was not found to be a skin sensitizer.

Acute and subacute toxicity studies in rats and mice indicate that DMMP exhibits little toxicity when administered orally. Rats and mice exhibited a lack of coordination, tremors, unsteady gait, muscular hypertonia and hypotonia, prostration, and reductions in spontaneous motility. Plasma cholinesterase levels were depressed in rats during a 3-day oral exposure to DMMP. DMMP was slightly toxic by the intravenous route of exposure.

Cellular lesions were observed in the stomachs of male mice receiving DMMP at ≥1250 mg/kg/day by oral intubation and in females receiving ≥5,000 mg/kg/day for 15 days. Although no stomach lesions occurred in similarly treated rats, death occurred in some rats (both male and female) dosed at ≥5,000 mg/kg/day and in mice at ≥10,000 mg/kg/day.

When DMMP was administered to mice for 13 weeks, no stomach lesions were observed.

In subchronic oral studies of DMMP, rats exhibited increased relative liver weights and death at high doses.

Decreased sperm motility, sperm counts, and male fertility index in male rats treated orally with DMMP were associated with decreased numbers of live fetuses and increased fetal resorptions in females. No developmental effects were observed in mice and rats.

In a 103-week oral study, survival and body weights decreased in rats of both sexes treated with DMMP at ≥ 1,000 mg/kg/day.

In another oral 103-week study, kidney cancer occurred in rats but the effect was complicated by an association with alpha-2-microglobulin, and only high-dose rats showed an increased incidence of mononuclear cell leukemia. Female rats did not develop cancer.

DMMP exhibited mutagenicity in mouse lymphoma cells and in Chinese hamster ovary cells. In other studies, DMMP induced sex-linked recessive lethal mutations in *Drosophila*. DMMP was nonmutagenic in bacterial mutagenicity tests in several strains of *Salmonella*, BABL/c 3T3 cells, and *Drosophila*. DMMP was positive in dominant-lethal assays in mice and rats.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

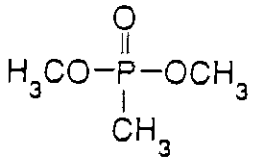
No Threshold Limit Value, Short Term-Exposure Limit, or Permissible-Exposure-Limit for IMPA has been designated.

Analytical methods for DMMP include gas chromatography/mass spectrometry, nuclear magnetic resonance, and plasma chromatography.

There were no specific treatment technologies for removing DMMP from drinking water reported in the literature. DMMP in the vapor phase may be destroyed in laboratory settings by photodestruction, decomposition in an alternating electrical current, and catalytic conversion. Even though DMMP strongly adsorbs to activated carbon, the use of granulated activated carbon (GAC) — a common technology for the removal of organics from water — was not found in the literature.

Physical and Chemical Properties

Empirical Formula	$CH_3P(O)(OCH_3)_2$
Synonyms	Dimethyl methanephosphonate; DMMP; Fyrol DMMP; Methanephosphonic acid dimethyl ester; Phosphonic acid methyl-, dimethyl ester
CAS Number	756-79-6
Physical State	Colorless liquid
Molecular Weight	124.08
Boiling Point	181°C
Liquid Density	1.145
Vapor Pressure	1 torr at 30°C
Solubility (in water)	Soluble



Health Effects Data and Advisory Values

Genotoxicity	Results were negative in *in vitro Salmonella typhimurium* tests. DMMP produced positive mutagenic effects in mouse lymphoma cells and Chinese hamster ovary cells with and without metabolic activation. In *in vivo* tests, DMMP induced sex-linked recessive lethal mutations in *Drosophila* and positive results in dominant-lethal assays in mice and rats.	
Reproductive and Developmental Effects	DMMP was shown to be toxic to the male reproductive system, producing decreased numbers of live fetuses and increased resorptions in females. DMMP was not found to be teratogenic.	
Cancer Classification	Group C: Possible Human Carcinogen	
Reference Dose (RfD)	0.2 mg/kg/day	
Drinking Water Equivalent Level (DWEL)	7 mg/L	
Health Advisory Values	One-Day	2 mg/L
	Ten-Day	2 mg/L
	Longer-Term (child)	2 mg/L
	Longer-Term (adult)	6 mg/L
	Lifetime	0.1 mg/L

This summary was developed using information from the Drinking Water Health Advisory.
A copy of the Health Advisory is available from the National Technical Information Service at (703) 487-4650.
The order number for the DMMP Health Advisory is PB93-117018.
For further information contact EPA's Office of Science and Technology at (202) 260-7571.

Office of Science and Technology
Office of Water
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

January 18, 1992

1,3-DINITROBENZENE (DNB)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

1,3-Dinitrobenzene (DNB) is a by-product in the manufacture of trinitrotoluene (TNT) explosives and nitrobenzene. It is used primarily in the production of m-phenylenediamine, a dye intermediate.

Production in the United States takes place mainly at one commercial plant in New Jersey where the 1983 production was reported to be 70,000 to 72,000 pounds. DNB occurs in the waste stream from TNT production and in wastewaters from dinitrobenzene manufacturing. It is also released to the atmosphere.

The environmental fate of DNB is not known, but in general, aromatic nitro compounds are resistant to hydrolysis and probably do not volatilize in water. DNB is not expected to bioaccumulate in aquatic organisms. Preliminary indications are that photolytic degradation may be an important fate while volatilization is not. Microbial degradation occurs in waste streams.

PHARMACOKINETICS

Inhalation and dermal absorption have been inferred from occupational exposures. Absorption of oral doses of DNB by rats and rabbits is 63-93%. DNB is distributed mainly to liver, fat, kidney, and nerve tissues and excreted primarily in the urine. Metabolism to the nitroanilines is the major metabolic pathway.

HEALTH EFFECTS

Humans

After occupational exposure to DNB dust (concentration unknown), six workers developed cyanosis, anemia, dizziness, and fatigue. Cyanosis and hemolytic jaundice were seen in another worker that was thought to have received dermal exposure of DNB. Formation of methemoglobin and urinary excretion of 2,4-dinitrophenol were observed in the worker.

HEALTH EFFECTS

Experimental Animals

Acute toxicity in rats is associated with respiratory failure, central nervous system disturbances including ataxia, motor dysfunction, and coma, and testicular damage and infertility.

No studies of potential dermal sensitization are available.

Drinking water studies in rats for 8 and 16 weeks showed decreased splenic and testicular weights and decreased spermatogenesis.

Effects reported from a 12-week oral study with rats were reduced spermatogenesis, atrophy of seminiferous tubules, reduced litter size, and ultimately infertility as well as increases in hemosiderin deposition in the spleen.

Although DNB is a potent testicular toxicant, no information on potential reproductive toxicity in females is available, and no multi-generation reproductive or developmental toxicity studies were located.

No lifetime or carcinogenicity studies were found.

DNB is mutagenic in some *Salmonella* strains.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

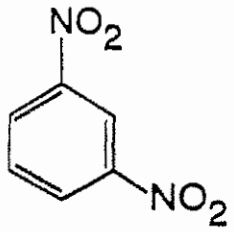
The American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour time-weighted average Threshold Limit Value for exposure to DNB and the Occupational Safety and Health Administration (OSHA) standard for exposure to all dinitrobenzenes are 1 mg/m^3.

Methods available for the analysis of DNB include gas chromatography, electron capture, tandem mass spectrometry, and spectrophotometric determination.

Treatment technologies for the removal of DNB in wastewater include aerobic or anaerobic microbial degradation, photolysis, and slaking with lime.

Physical and Chemical Properties

Empirical Formula	$C_6H_4N_2O_4$
Synonyms	DNB, 1,3-DNB, m-Dinitrobenzene, m-DNB
CAS Number	99-65-0
Physical State	Colorless to yellow crystalline solid at room temperature
Molecular Weight	168.11
Boiling Point	300-302°C at 770 mm Hg
Melting Point	89.8°C
Specific Gravity	1.571 at 0-4°C
Vapor Pressure	0.0039 mm Hg at 20°C
Solubility	In water: 369 mg/L at 20°C and 500 mg/L at 25°C.



Health Effects Data and Advisory Values

Genotoxicity

Mixed results (positive and negative) in *Salmonella typhimurium* strains with and without activation. No effect on *Saccharomyces cerevisiae* or *Escherichia coli*. No increase in unscheduled DNA synthesis in cultivated rat hepatocytes.

Reproductive and Developmental Effects

Nine studies of male reproductive function using single, short-term, or longer-term oral doses show testicular damage and infertility. However, no reproductive or developmental studies evaluating potential reproductive effects in females are available.

Cancer Classification

EPA Group D, not classifiable as to human carcinogenicity.

Reference Dose (RfD)

0.0001 mg/kg/day

Drinking Water Equivalent Level (DWEL)

0.005 mg/L

Health Advisory Values

One-Day	0.04 mg/L
Ten-Day	0.04 mg/L
Longer-Term (child)	0.04 mg/L
Longer-Term (adult)	0.14 mg/L
Lifetime	0.001 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

Office of Science and Technology
Office of Water
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

June 17, 1991

DIPHENYLAMINE (DPA)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Diphenylamine (DPA) is a crystalline solid at room temperature and practically insoluble in water. It is used to stabilize nitrocellulose explosives and celluloid in various gun propellant compositions. It is also used extensively as a dip spray and impregnate of paper wraps to prevent scald on apples and other fruits, and as an insecticide. Therapeutically, DPA derivatives are used to treat parasitic infections. DPA is used in the manufacturing of dyes, polymers, greases, and oils; in producing industrial antioxidants for rubber; and as an analytical reagent.

DPA has been detected in the effluent from manufacturing plants in California, in Rhine River water, and in Norwegian rainwater.

Limited data are available on the fate of DPA in the environment. However, based on its solubility and calculated vapor pressure, DPA is predicted to ilize slowly. DPA is subject to microbial degradation.

PHARMACOKINETICS

No specific animal or human data on the absorption and distribution of DPA following ingestion are available. However, metabolic studies of DPA suggest that absorption does occur. DPA is rapidly excreted in the urine and is found in the bile of male rats that have been injected with DPA.

HEALTH EFFECTS

Humans

Except for some dermal studies in occupational workers, no epidemiological, clinical case histories, or experimental studies of potential human health effects from DPA are available. In patch tests on occupational workers, DPA was not found to be irritating to the skin.

HEALTH EFFECTS

Experimental Animals

DPA was not found to be irritating when applied trength to the skin of rabbits.

Rats, hamsters, and gerbils exhibited DPA-related mortality and kidney damage in acute oral studies. In other acute oral studies, DPA induced central nervous system toxicity and cyanosis in both rats and mice.

In a 28-day study where DPA was administered to rats daily by gavage, decreased body weight and liver weight and changes in the blood, kidney, spleen, bone marrow, and stomach were observed.

In an 8-month feeding study with female rats, dietary levels at or above 0.5% DPA (or 550 mg/kg/day) caused dose-related decreases in body weight gain and liver and kidney changes. Results in a lifetime feeding study with rats showed anemia and kidney changes, as well as depressed body weight gains.

In a 2-year feeding study with a small number of beagle dogs, DPA decreased body weight gain and produced mild anemia, liver, kidney, and blood effects.

Although DPA appeared to decrease average litter size and induce kidney disease in newborns in some rat strains, the data are inadequate to draw conclusions regarding reproductive and development potential.

Lifetime feeding studies in rats and mice and a chronic feeding study in dogs did not reveal DPA-related carcinogenic effects; however, design deficiencies or a lack of data limit any conclusions regarding potential carcinogenic effects.

DPA was not mutagenic in the Ames reverse mutation assay. DPA was also nonmutagenic in mouse lymphoma cells and in cultured rat hepatocytes.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

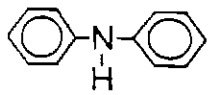
The Threshold Limit Value-Time-Weighted Average Concentration for DPA is 10 mg/m^3.

Gas chromatography is effective in analyzing DPA content in apples. Gas-liquid chromatography is used for detecting DPA in nitrocellulose-based propellants.

No specific treatment technologies are available for removing DPA from water, although the U.S. EPA has developed a carbon isotherm of 120 mg/g for the adsorption of DPA on activated carbon.

Physical and Chemical Properties

Empirical Formula	$C_{12}H_{11}N$
Synonyms	N,N-Diphenylamine; N-Phenylaniline; N-Phenylphenate; Phenylbenzeneamine; Anilinobenzene; Big Dipper; Scaldip; No Scald
CAS Number	122-39-4
Physical State	Colorless to grayish solid
Molecular Weight	169.23
Melting Point	52.8-55°C
Specific gravity	1.159 at 25°C
Vapor Pressure	1 mmHg at 108.3°C
Solubility	30-35.7 mg/L in water at 25°C



Health Effects Data and Advisory Values

Genotoxicity

DPA was not mutagenic in the Ames reverse mutation assay with *Salmonella typhimurium* strains, in *Escherichia coli* with and without metabolic activation, in cultured mouse lymphoma cells, and in cultured hepatocytes.

Reproductive and Developmental Effects

Published studies are inadequate to determine the potential reproductive and developmental effects of DPA.

Cancer Classification

EPA Group D: Not classifiable as to human carcinogenicity.

Reference Dose (RfD)

0.03 mg/kg/day

Drinking Water Equivalent Level (DWEL)

1.0 mg/L

Health Advisory Values

One-Day	1.0 mg/L
Ten-Day	1.0 mg/L
Longer-Term (child)	0.3 mg/L
Longer-Term (adult)	1.0 mg/L
Lifetime	0.2 mg/L

This summary was developed using information from the Drinking Water Health Advisory.
A copy of the Health Advisory is available from the National Technical Information Service at (703) 487-4650.
The order number for the DPA Health Advisory is PB93-116978.
For further information contact EPA's Office of Science and Technology at (202) 260-7571.

Office of Science and Technology
Office of Water
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

January 18, 1993

1,4-DITHIANE

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

1,4-Dithiane (diethylene disulfide) exists as a volatile, white, monoclinic, crystalline solid at room temperature. Although there is no known mechanism for 1,4-dithiane formation, mustard gas is thought to undergo polymerization and dealkylation reactions during storage to produce 1,4-dithiane.

1,4-Dithiane has been found in groundwater near Denver, Colorado, at concentrations of 3,600 to 9,678 µg/L, and in Maryland at concentrations of 1,000 µg/L (1 ppm).

There are few data on the environmental fate of 1,4-dithiane. However, it easily photo-oxides to sulfoxides and sulfones and readily forms metal halide-addition compounds. No studies of the fate of 1,4-dithiane in aqueous media are available.

PHARMACOKINETICS

No quantitative data on the absorption of 1,4-dithiane from oral, inhalation, or dermal exposure have been found in the available literature. One study, however, provided evidence that 1,4-dithiane is systemically absorbed following oral gavage.

HEALTH EFFECTS

Humans

No studies on the health effects of 1,4-dithiane to humans were found in the literature.

HEALTH EFFECTS

Experimental Animals

Rats given an acute oral dose of 1,4-dithiane developed central nervous system problems, tearing and crusty eyes, lethargy, and crusty noses, as well as gastrointestinal disturbances.

In a 90-day oral study with rats, the most significant finding was the presence of anisotropic crystals of an undetermined composition in the nasal olfactory mucosa of both sexes. Morphologic lesions also occurred in female liver and male kidney, and these changes were associated with increased absolute weights of these organs.

No lifetime, reproductive, developmental, or carcinogenicity studies were available.

It has been determined that 1,4-dithiane is nonmutagenic in *Salmonella typhimurium* with and without metabolic activation. No other mutagenicity studies are available.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

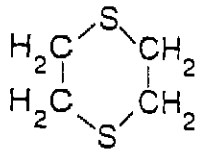
No Threshold Limit Value, Short-Term-Exposure Limit, or Permissible-Exposure-Limit for 1,4-dithiane has been designated.

Gas chromatography and mass spectrometry are the most widely applied methods for analyzing 1,4-dithiane. Nuclear magnetic resonance spectroscopy has been used to analyze the chemical structure of 1,4-dithiane.

No specific information on the treatment of 1,4-dithiane in water is available.

Physical and Chemical Properties

Empirical Formula	$C_4H_8S_2$
Synonyms	Diethylene disulfide; Diethylene sulfide; *p*-Dithiane; 1,4-Dithiacyclohexane; Tetrahydro-1,4-Dithiin; Triethylene trisulfide (early 1920s misnomer); Tetramethylene 1,4-disulfide (German equivalent)
CAS Number	505-29-3
Physical State	White, monoclinic crystals at 25°C; moderately clear, prism shaped crystals
Molecular Weight	120.23
Melting Point	111-112°C (ranging from 108-113°C)
Boiling Point	119-200°C (1 atm, 769 mm Hg)
Vapor Pressure	0.8 mm Hg at 25°C (estimated); 51.4 mm Hg at 111°C, over liquid (estimated);
Solubility	11.88 g/L in water at 25°C.



Health Effects Data and Advisory Values

Genotoxicity	1,4-Dithiane was not mutagenic in the Ames Salmonella/Mamalian Microsome Mutagenicity Assay.	
Reproductive and Developmental Effects	No studies were available for evaluating potential reproductive and developmental effects.	
Cancer Classification	EPA Group D: Not classifiable as to human carcinogenicity.	
Reference Dose (RfD)	0.01 mg/kg/day	
Drinking Water Equivalent Level (DWEL)	0.4 mg/L	
Health Advisory Values	One-Day	0.4 mg/L
	Ten-Day	0.4 mg/L
	Longer-Term (child)	0.4 mg/L
	Longer-Term (adult)	1.0 mg/L
	Lifetime	0.08 mg/L

This summary was developed using information from the Drinking Water Health Advisory.
A copy of the Health Advisory is available from the National Technical Information Service at (703) 487-4650.
The order number for the 1,4-Dithiane Health Advisory is PB93-117026.
For further information contact EPA's Office of Science and Technology at (202) 260-7571.

Office of Science and Technology
Office of Water
U.S. Environmental Protection Agency
401 M Street, SW
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January 18, 1993

HEXACHLOROETHANE

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Hexachloroethane is used by the military in the production of pyrotechnic devices and screening smokes. It is commercially used as a pressure lubricant, in fluorocarbon production, and in rubber, insecticide, paint, and fire extinguishing formulations.

Most hexachloroethane used in the United States is imported with an annual import of about 1.6 million pounds between 1973-1979. U.S. production is generally limited to its formulation as a co-product in the manufacture of other chlorinated ethanes. Average annual (1966-1977) use of hexachloroethane for military smoke devices was 193,000 pounds. Hexachloroethane wastes occur in effluents from chemical plants and have been found in ground water, soil, and air.

The environmental fate of hexachloroethane is not well established, but experimental data indicate that it volatilizes to the atmosphere from water and soil. In the atmosphere, it is generally stable. It can be biotransformed, will adsorb to sediments, and bioaccumulates.

PHARMACOKINETICS

Hexachloroethane is absorbed following ingestion, inhalation, or dermal contact in rats, mice, rabbits, and sheep. It preferentially accumulates in body fat. It is excreted primarily in expired air and urinary excretion plays a minor role. Following oral intake, it is metabolized mainly to tetrachloroethylene in sheep, and to trichloroethanol and trichloracetic acid in rats and mice. Reduction and dechlorination is proposed as the main mode of metabolism of hexachloroethane.

HEALTH EFFECTS

Humans

Ingestion of hexachloroethane by two persons over a 3-4 day period reduced their skin sensitivity.

Data from occupational health surveys indicate that hexachloroethane adversely effects the central nervous system (typically, workers cannot close their eyes). Direct exposure to hexachloroethane fumes causes eye irritation, inflammation, tearing, and photophobia.

HEALTH EFFECTS

Experimental Animals

Acute oral toxicity in rats and guinea pigs is associated with tremor, ataxia, gasping, and red exudate around the eyes. Single oral doses in sheep produced liver toxicity.

Hexachloroethane is a mild skin irritant in rabbits and causes eye swelling and discharge, corneal opacity, and iritis. No skin sensitization was observed in guinea pigs.

Decreased body weight gain, increased liver and kidney weights, and liver and kidney histopathology were seen in rabbits given oral doses for 12 days and rats similarly exposed for 16 days. Additional adverse kidney effects are observed in male rats.

In a 16-week feeding study with rats, histopathological lesions were evident in the kidneys of males as well as some liver lesions.

No reproductive studies were found. Although hexachloroethane was not shown to be teratogenic, fetotoxic effects were indicated. Mutagenic tests in bacterial assays were negative.

The toxic effects following 78 weeks of oral exposure were tumors of the testes in male rats, and liver carcinomas in mice. Toxic effects seen in a 2-year oral study with rats included cancer of the kidneys in males.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

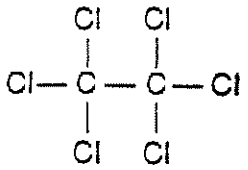
The American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour time-weighted average Threshold Limit Value for exposure to hexachloroethane is 9.7 mg/m^3. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit is 10 mg/m^3.

Methods available for the analysis of hexachloroethane involve extraction with an organic solvent followed by various modifications of the gas-liquid chromatography technique.

No information was found regarding technologies for the removal of hexachloroethane from water. However, in studies of environmental fate, hexachloroethane in water has been biotransformed under aerobic and anaerobic conditions.

Physical and Chemical Properties

Empirical Formula	C_2Cl_6
Synonyms	Carbon hexachloride, Perchloroethane, Ethanehexachloride, 1,1,1,2,2,2-Hexachloroethane, Hexachlorethylene, Avlothane, Distokal, Distopan, Distopin, Egitol, Falkitol, Fasciolin, Hexoram, Phenohep
CAS Number	67-72-1
Physical State	White crystalline solid
Molecular Weight	236.74
Boiling Point	186.8°C
Melting Point	186.8-187.4°C (sublimes)
Density	2.091 at 20°C
Vapor Pressure	0.4 mmHg at 20°C
Solubility	In water: 50 mg/L at 22°C. Very soluble in alcohol and ether. Soluble in benzene, chloroform, and oils.



Health Effects Data and Advisory Values

Genotoxicity

Hexachloroethane did not induce genetic effects in *in vitro Salmonella typhimurium* and *Saccharomyces cerevisiae* assays.

Reproductive and Developmental Effects

No reproductive studies were found. A developmental effects study in rats orally exposed to hexachloroethane indicated that it is not teratogenic, although gestation time was reduced, the number of viable fetuses was decreased, and there was an increase in fetal resorption.

Cancer Classification

EPA Group C, possible human carcinogen, based on hepatocellular carcinomas in $B6C3F_1$ mice of both sexes.

Reference Dose (RfD)

0.0013 mg/kg/day

Drinking Water Equivalent Level (DWEL)

0.035 mg/L

Health Advisory Values

One-Day	5 mg/L
Ten-Day	5 mg/L
Longer-Term (child)	0.13 mg/L
Longer-Term (adult)	0.45 mg/L
Lifetime	0.001 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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June 17, 1991

HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Hexahydro-1,3,5-trinitro-1,3,5-triazine, commonly designated RDX (British code name for Research Department Explosive or Royal Demolition Explosive), is an extensively used high-impact explosive in munition formulations. It is also used as a rat poison.

RDX is chemically stable and can be stored up to 10 months at 85°C without deteriorating.

Production in the United States is mainly at one Army ammunition plant. RDX in wastewater is not expected to be appreciable because of the low solubility of RDX in water. However, the potential for aquatic pollution may exist from RDX manufacturing, loading, transportation, and storage.

In soils, RDX persists, resists aerobic bacterial degradation, and slowly leaches into ground water. RDX is rapidly degraded by light. Volatilization is not a ificant environmental fate.

PHARMACOKINETICS

RDX is completely absorbed when ingested, the rate being faster in rats than in humans, and rapidly distributes to body tissues. Highest RDX levels are found in kidneys, liver, brain, and heart. RDX is metabolized by the liver, and its metabolites are excreted in urine. The metabolites have not been characterized.

HEALTH EFFECTS

Humans

In some case studies of RDX ingestion by military personnel, symptoms of central nervous system (CNS) dysfunction including convulsions and coma were observed.

Data gathered through an occupational health study at an Army ammunition plant indicated that inhalation of dust containing RDX at unknown levels causes nausea and CNS dysfunction including convulsions and unconsciousness. In another study, medical tests of workers exposed to 1.57 mg RDX/m³ or less revealed no adverse health effects.

ALTH EFFECTS

Experimental Animals

Single oral doses of RDX in rats and mice produce convulsions, labored breathing, and other CNS effects. Oral doses of RDX for 10 days in monkeys induced vomiting and convulsions.

Tests in rabbits indicate that RDX produces dermatitis. Slight erythema was observed in guinea pigs after the first but not subsequent applications. No conclusive results were obtained in dogs given repeated topical applications of RDX.

Toxic effects seen in 13-week feeding studies with rats and mice were increased liver weights and anemia.

Lifetime feeding studies in rats and mice showed increased mortality, weight loss, anemia, liver and kidney toxicity, testicular degeneration, and prostate inflammation.

Decreased fertility was observed in a two-generation reproductive study in rats. Decreased pup weights and embryo toxicity but no teratogenic effects were seen in the F_1 litter.

RDX has not been found to be mutagenic. It induces hepatocellular carcinomas and adenomas in mice.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

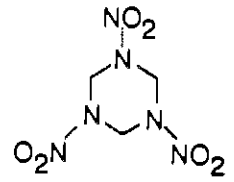
The American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour time-weighted average Threshold Limit Value (TLV) for exposure to RDX is 1.5 mg/m³. The U.S. Army Medical Bioengineering Research and Development Laboratory recommends an RDX limit of 0.03 mg/L in drinking water.

Methods are available for the analysis of RDX in bulk material and in trace quantities. Volumetric methods involving reduction, hydrolysis, or acid-base titrations are used for bulk analysis. For analyzing trace quantities (below 10 parts per million), high-performance liquid chromatography appears to be the method of choice. Other methods include thin-layer chromatography, gas-liquid chromatography, and single-sweep polarography.

Treatment technologies for the removal of RDX in wastewater include ultraviolet (UV) radiation in combination with hydrogen peroxide, strongly alkaline ion exchange resins, chemical oxidation, chemical coagulation with lime, activated carbon, and aerobic and anaerobic microbial degradation.

Physical and Chemical Properties

Empirical Formula	$C_3H_6N_6O_6$
Synonyms	RDX, Cyclonite, Hexogen, Cyclotrimethylenetrinitramine, Hexahydro-1,3,5-trinitro-1,3,5-triazine, sym-Trimethylenetrinitramine, 1,3,5-Trinitrohexahydro-s-triazine, T_4
CAS Number	121-82-4
Physical State	White crystalline solid
Molecular Weight	222.26
Melting Point	204.1°C
Specific Gravity	1.816 at 20°C
Solubility (at 25°C)	In water: 7.6 mg/L. In acetone: 8.3% w/w. In nitrobenzene: 1.5% w/w.



Health Effects Data and Advisory Values

Genotoxicity

RDX did not induce genetic effects in *Salmonella typhimurium* and *Saccharomyces cerevisiae* assays, or in a rat dominant lethal assay. No unscheduled DNA synthesis was seen in *in vitro* studies with human fibroblasts.

Reproductive and Developmental Effects

Reduced rates of mating and fertility and decreased litter size and pup survival, but no teratogenic effects, were reported in a two-generation study of Fischer 344 rats. No developmental effects were found in New Zealand rabbits below maternally toxic doses.

Cancer Classification

EPA Group C, possible human carcinogen, based on hepatocellular adenomas and carcinomas in female B6C3F1 mice.

Reference Dose (RfD)

0.003 mg/kg/day

Drinking Water Equivalent Level (DWEL)

0.1 mg/L

Health Advisory Values

One-Day	0.1 mg/L
Ten-Day	0.1 mg/L
Longer-Term (child)	0.1 mg/L
Longer-Term (adult)	0.4 mg/L
Lifetime	0.002 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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June 17, 1991

ISOPROPYL METHYLPHOSPHONIC ACID (IMPA)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Isopropyl methyl phosphonic acid (IMPA) is a degradation product of the nerve gas isopropyl methylphosphonofluoridate (GB or Sarin).

IMPA is a moderately strong acid that is virtually non-volatile and, therefore, an unlikely atmospheric contaminant. It is also soluble in water.

IMPA is known to have contaminated groundwater at a former Sarin production and storage site near Denver, Colorado, with IMPA concentrations ranging from less than 0.4 µg/L to 26,236 µg/L.

Minimal abiotic or biotic degradation of IMPA occurs in the environment.

PHARMACOKINETICS

The evidence suggests that intestinal absorption of IMPA occurs. The highest concentrations of IMPA following intravenous injection are found in the kidney, lung, and brain. IMPA binds rapidly to tissue proteins. IMPA is removed from the body primarily in urine and without metabolic alteration.

HEALTH EFFECTS

Humans

No information was found in the literature regarding adverse health effects associated with short- or long-term exposure of humans to IMPA.

HEALTH EFFECTS

Experimental Animals

Tests in rabbits show that IMPA is a very mild skin irritant and not an eye irritant.

The oral LD_{50} values for rats and mice (5,000 to 7,700 mg/kg) are indicative of low acute toxicity. Compound-related adverse effects did not develop in rats that were exposed to concentrations of up to 3,000 mg/L (up to 400 mg/kg/day) in drinking water for 90 days.

There are no data on the potential reproductive or developmental toxicity of IMPA, or on its mutagenic and carcinogenic potential.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

In 1984, the U.S. Army Medical Bioengineering Research and Development Laboratory recommended water concentrations for IMPA of 16.75 mg/L for ambient water and 16.80 mg/L for drinking water as an interim criteria for the protection of human health.

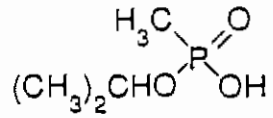
No Threshold Limit Value, Short Term-Exposure Limit, or Permissible-Exposure-Limit for IMPA has been designated.

Methods for the analysis of IMPA utilize some form of ion exchange or liquid chromatography. Chromatographic procedures are sometimes combined with mass spectrometry or some other suitable technique to facilitate the identification of the specific phosphonic acid present.

Oxidation of water containing IMPA using oxygen, hydrogen peroxide, and ultraviolet light is a potential treatment option, although careful control of reaction conditions is important. No additional information has been located in the literature on the use of specific treatment technologies for the removal of IMPA from drinking water.

Physical and Chemical Properties

Empirical Formula	$C_4H_{11}O_3P$
Synonyms	Isopropyl methylphosphonate; methyl phosphonic acid, isopropyl ester; phosphonic acid, methyl, monoisopropyl ester; phosphonic acid, methyl, mono(1-methylethyl) ester
CAS Number	1832-54-8 (acid) 6838-93-3 (sodium salt)
Physical State	Liquid (acid) Solid (sodium salt)
Molecular Weight	138.12
Boiling Point	123-125°C (0.2 torr)
Melting Point	No data
Density	1.1091 at 20°C



Health Effects Data and Advisory Values

Genotoxicity	Results in *in vitro Salmonella typhimurium* tests were negative when tested according to the Ames protocol both with and without metabolic activation.	
Reproductive and Developmental Effects	No information was found in the available literature regarding potential reproductive or developmental effects of IMPA.	
Cancer Classification	Group D: Not classifiable as to human carcinogenicity. No information was found in the available literature regarding the carcinogenic potential of IMPA.	
Reference Dose (RfD)	0.1 mg/kg/day	
Drinking Water Equivalent Level (DWEL)	4 mg/L	
Health Advisory Values	One-day	30 mg/L
	Ten-day	30 mg/L
	Longer-term (10-kg child)	30 mg/L
	Longer-term (70-kg adult)	100 mg/L
	Lifetime	0.7 mg/L

This summary was developed using information from the Drinking Water Health Advisory.
A copy of the Health Advisory is available from the National Technical Information Service at (703) 487-4650.
The order number for the IMPA Health Advisory is PB92-232149.
For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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January 18, 1992

NITROCELLULOSE

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Nitrocellulose, commonly called "guncotton", is a principal ingredient of propellants, smokeless powder, rocket fuel, mortar, and certain explosives.

Nitrocellulose is produced for the military at selected Army ammunition plants. In wastewater, the suspended solids contain typically military grade (12.9% nitrogen, 5 micron length) nitrocellulose.

Chemically-unaltered nitrocellulose is resistant to biological degradation and is persistent in the environment. It readily adsorbs to biologically-important macromolecules.

PHARMACOKINETICS

Available data show that nitrocellulose cannot be absorbed by any route of exposure, although results in dogs are inconclusive. Oral doses in rats remain in the gastrointestinal tract until excreted in feces.

HEALTH EFFECTS

Humans

Data on potential health effects in humans are not available. Death from intestinal impaction may be infered from animal studies when ingested in large quantity (10% of the diet).

HEALTH EFFECTS

Experimental Animals

Acute toxicity studies in rats and mice indicate that nitrocellulose is nontoxic.

Tests in rabbits showed nitrocellulose to be non-irritating to the skin and eyes.

No adverse health effects were observed in a week feeding study in rats, mice, and dogs, nor was nitrocellulose found to be carcinogenic. Early deaths due to intestinal blockage was found in mice fed high dose (10%) in the diet.

Effects seen in rats, mice, and dogs given oral doses of nitrocellulose for 24 months included increased food consumption and decreased weight gain in rats and mice. Early deaths in high-dose mice were attributed to intestinal impaction by nitrocellulose fibers. No treatment-related adverse effects were observed in dogs.

No adverse effects were found in a three-generation reproductive study; however, the increased inert bulk of nitrocellulose in the parents' diet may have caused reduced lactation and pup weight. No teratogenic studies were reported.

Nitrocellulose is reported to be non-mutagenic in various bacterial assays and cytogenic tests.

Nitrocellulose in the diet did not significantly affect the incidence of tumors over a 24-month period in rats, mice, and dogs.

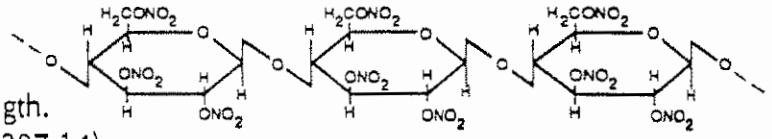
OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

Methods available for the analysis of nitrocellulose in aqueous solutions involve prefiltering of the nitrocellulose fibers from water on filters. The most effective method for analysis of low levels of nitrocellulose following pre-filtering is by colorimetry of hydrolytically liberated nitrite ion in acetone and diazotization. Other methods include ferrous titanous titration, ferrous sulfate titration, liberation of NO_2 gas, analysis of NH_3 after reduction by Devarda's alloy, transnitration of salicylate or citrate followed by ferrous titanous titration, chromous chloride-ferric ammonium sulfate micro-determination, and zinc dust reduction of the nitrate ester.

Nitrocellulose fibers are removed from wastewater by neutralizing, settling, centrifuging, and/or screening the fibers. The Army has also developed a chemical-microbiological process for nitrocellulose degradation in wastewater. The waste is filtered and subjected to alkali and acid treatments, followed by anaerobic fermentation and aerobic activated sludge treatment.

Physical and Chemical Properties

Empirical Formula	$[C_6H_7O_2(ONO_2)_3]_n$
Synonyms	Cellulose trinitrate, Nitrocellulose, Guncotton
CAS Number	9004-70-0
Physical State	White, fibrous, cotton-like solid
Molecular Weight	Varies with chain length. Fully nitrated form: $(297.14)_n$
Melting Point	160-170°C
Specific Gravity	1.66
Solubility	Insoluble in water, ethanol, benzene, and most other solvents. Soluble in acetone (all proportions), methylethylketone, nitrobenzene, tetrahydrofuran, and ethyl, butyl, and amylacetate.
Flash Point	12.7°C
Autoignition	160-170°C



Health Effects Data and Advisory Values

Genotoxicity	Negative results in *in vitro Salmonella typhimurium* assays. *In vivo* cytogenic effects negative in rat kidney cells, lymphocytes, and bone marrow.
Reproductive and Developmental Effects	No adverse effects in three-generation studies of rats, although inert bulk (10% fiber) of nitrocellulose may reduce lactation index and pup weight. No data were available in the literature concerning potential developmental effects.
Cancer Classification	Not classified by EPA.
Reference Dose (RfD)	Not available.
Drinking Water Equivalent Level (DWEL)	Not available.
Health Advisory Values	Advisories appear to be unnecessary because of the lack of toxicological indicators and apparent non-absorption and non-digestion of nitrocellulose fibers.

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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June 17, 1991

NITROGUANIDINE

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Nitroguanidine is a widely used military explosive because it provides thrust and stability while reducing the burning temperature and flash intensity of propellent formulations.

Production in the United States is mainly at one Army ammunition plant. Nitroguanidine in wastewater presents the potential for aquatic pollution.

The environmental fate of nitroguanidine is dominated by photolysis and biotransformation processes. The addition of organic nutrients are required for biotransformations. The end product of nitroguanidine utilization by microbes appears to be cyanamide. Adsorption of nitroguanidine to soils and sediments is not a significant fate.

PHARMACOKINETICS

Nitroguanidine is rapidly absorbed following ingestion and is rapidly excreted unchanged in the urine. Data indicate that it is not extensively metabolized. Limited information is available regarding its distribution following oral ingestion, but evidence suggests that it is widely distributed.

HEALTH EFFECTS

Humans

No data are available regarding the health effects of nitroguanidine in humans.

HEALTH EFFECTS

Experimental Animals

Exposures of rats and mice to single oral doses produced toxic effects on the respiratory, gastrointestinal, and central nervous systems, including lack of coordination, tremors, and convulsions.

Tests in rabbits indicate that nitroguanidine is not a skin irritant. When applied directly to rabbit eyes, slight conjunctival inflammation was observed, probably caused by undissolved nitroguanidine. In guinea pig tests, nitroguanidine did not sensitize the skin.

Results of a 14-day feeding study with rats showed nitroguanidine to be an osmotic diuretic.

Toxic effects of a 90-day feeding study with rats included decreased body weights and serum electrolytes, increased water consumption, and decreased heart weights (females). In a similar study of mice, males had reduced heart weights.

Results of a chronic study of nitroguanidine toxicity were inconclusive. No carcinogenicity studies are available.

Although no gonadotoxic or mutagenic effects were found, the reproductive study results were inconclusive. Developmental effects reported in rats and rabbits include increased fetal resorptions, decreased pup size and weight, and increased incidence of skeletal variations.

In vitro and *in vivo* genetic nitroguanidine toxicology assays were uniformly negative.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

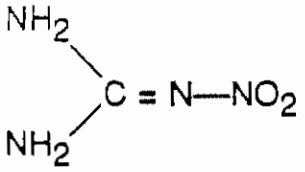
The American Conference of Governmental Industrial Hygienists (ACGIH) have not determined an 8-hour time-weighted average Threshold Limit Value for exposure to nitroguanidine. The Occupational Safety and Health Administration (OSHA) has not established a Permissible Exposure Limit (PEL) for nitroguanidine. The U.S. Army Environmental Hygiene Agency proposed an interim 8-hour workplace PEL for nitroguanidine of 4.0 mg/m^3 total dust.

The preferred method for the analysis of nitroguanidine, its organic constituents, and related compounds (nitrosoguanidine, cyanoguanidine, melamine, and ammeline) in wastewater is reversed-phase, high-performance liquid chromatography.

Treatment technologies available for the removal of nitroguanidine in wastewater include microbial degradation with lime pretreatment, strong ultraviolet light, adsorption on activated carbon, and ion exchange resins.

Physical and Chemical Properties

Empirical Formula	$CH_4N_4O_2$
Synonyms	NQ, NG, NGu, alpha-Nitroguanidine, beta-Nitroguanidine, Guanidine-1-nitro, Guanidine-nitro, Nitroguanidine, N''-nitroguanidine, N(1)-nitroguanidine, Picrite
CAS Number	556-88-7
Physical State	Colorless, crystalline solid. Exists in two forms: alpha (needles) and beta (plates)
Molecular Weight	104.07
Melting Point	232-245°C (decomposes)
Specific Gravity	1.81
Density	1.72 g/cm³
Solubility	In water: 4.4 g/L at 25°C and 82.5 g/L at 100°C. In potassium hydroxide: 12 g/L at 25°C. In 40% H_2SO_4: 80 g/L at 25°C.



Health Effects Data and Advisory Values

Genotoxicity	No genetic effects seen in *Salmonella typhimurium* strains, no mitotic recombination in *Saccharomyces cerevisiae*, and no DNA damage/ repair in *Escherichia coli* strains. Possible sex-linked recessive lethal mutation in *Drosophila melanogaster.* Negative in several *in vitro* and *in vivo* assays.
Reproductive and Developmental Effects	No reproductive effects. Increased fetal resorptions, decreased pup size and weight, and increased incidence of skeletal variations in rat and rabbit developmental studies.
Cancer Classification	EPA Group D, not classifiable as to human carcinogenicity.
Reference Dose (RfD)	0.105 mg/kg/day
Drinking Water Equivalent Level (DWEL)	4 mg/L

Health Advisory Values

One-Day	11 mg/L
Ten-Day	11 mg/L
Longer-Term (child)	11 mg/L
Longer-Term (adult)	37 mg/L
Lifetime	0.74 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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June 17, 1991

OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine, commonly designated HMX (High Melting Explosive), is used as a component in plastic-bonded explosives, in solid fuel rocket propellants, and in military munitions. It is also used to implode fissionable material in nuclear devices.

HMX is manufactured in the United States at one Army ammunition plant. Because of its low solubility in water, HMX is not expected to appear in appreciable quantities in wastewater. However, a potential for aquatic pollution may exist from HMX manufacturing, loading, transportation, and storage.

The dominant fate of HMX in aquatic environments is degradation by photolysis. In wastewater, rapid aerobic biotransformation of HMX occurs. HMX migrates slowly through soils with greatest migration rates in coarse loamy soils.

PHARMACOKINETICS

HMX is poorly absorbed when ingested (of an original dose, 70% in mice and 85% in rats was recovered unmetabolized in feces). Intravenous doses do not accumulate in body tissues and are excreted (61% of original dose) in urine. Metabolism is minimal, and the nature of metabolites is not known.

HEALTH EFFECTS

Humans

Data gathered through an occupational health study of 93 workers at an Army ammunition plant indicated that atmospheric exposure to HMX at unknown levels causes no hematologic, hepatic, or renal system abnormalities or autoimmune disease. Seventy-four percent of these workers were also indirectly exposed to hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in which HMX is a contaminant.

Patch tests with solid HMX produced skin irritation in occupational workers from an Army ammunition plant.

HEALTH EFFECTS

Experimental Animals

Single oral doses or acute dermal doses of HMX in rabbits induced central nervous system toxicity.

Tests in rabbits indicate that HMX is a mild skin irritant but not an eye irritant. In a guinea pig skin test, HMX had no effect.

Studies in rats and mice fed HMX for periods up to 14 days showed hunched posture, subdued appearance, piloerection, and convulsions. Histopathological examination revealed hepatocellular hyperplasia and increased cytoplasmic eosinophilia of the liver with lymphocyte depletion in thymus and spleen.

Effects seen in a 13-week feeding study with rats were decreased weight gain, adverse hematology and clinical chemistry, liver changes in males, and kidney changes in females. In a 13-week feeding study in mice, excessive mortality occurred at high doses. Otherwise no signs of toxicity and no remarkable pathologic changes were observed.

No lifetime, reproductive, developmental, or carcinogenicity studies were available.

Based on studies limited to microbial systems, no conclusions can be drawn from the literature regarding the potential, if any, of adverse genotoxic HMX effects.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

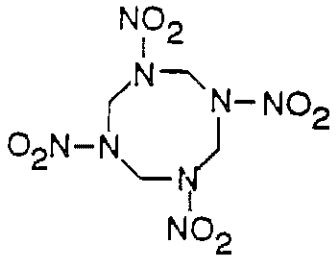
No threshold limit value nor short-term exposure limit for HMX has been designated.

Methods for the analysis of HMX are available for bulk material and for trace quantities. Volumetric methods involving reduction , hydrolysis, or acid-base titrations are used for bulk analysis. For analyzing trace quantities (below 10 parts per million), high-performance liquid chromatography appears to be the method of choice. Other methods include thin-layer chromatography, single-sweep polarography, and gas chromatography.

Treatment technologies for the removal of HMX in wastewater include ultraviolet (UV) radiation in combination with hydrogen peroxide, photolysis with UV light, alkaline hydrolysis (of concentrated HMX solutions), and activated carbon. Pilot studies with biotechnology are promising.

Physical and Chemical Properties

Empirical Formula	$C_4H_8N_8O_8$
Synonyms	HMX, Cyclotetramethylenetetranitramine, Octahydro-1,3,5,7-tetranitroazocine, Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine octogen, RRI 1,3,5,7-tetranitro-1,3,5,7-tetraazocyclooctane
CAS Number	2691-41-0
Physical State	Colorless, crystalline solid; four polymorphic forms
Molecular Weight	296.16
Melting Point	276 to 280°C
Specific gravity	1.87 (beta form)
Vapor Pressure	3×10^{-9} mm Hg at 100°C
Solubility	In water at 20°C: 6.63 mg/L. In acetone at 30°C: 2,200 mg/L. In dimethyl sulfoxide: 57 g/100 g.



Health Effects Data and Advisory Values

Genotoxicity	Although HMX has not been shown to be mutagenic, the results are inconclusive because the concentrations tested were low and the reported data inadequate.
Reproductive and Developmental Effects	No studies were available for evaluating potential reproductive and developmental effects.
Cancer Classification	EPA Group D, not classifiable as to human carcinogenicity.
Reference Dose (RfD)	0.05 mg/kg/day
Drinking Water Equivalent Level (DWEL)	2 mg/L

Health Advisory Values

One-Day	5 mg/L
Ten-Day	5 mg/L
Longer-Term (child)	5 mg/L
Longer-Term (adult)	20 mg/L
Lifetime	0.4 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

Office of Science and Technology
Office of Water
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401 M Street, SW
Washington, DC 20460

June 17, 1991

TRINITROGLYCEROL (TNG)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Trinitroglycerol, or glyceryl trinitrate, has been widely used in commercial blasting and military explosives. It is also used extensively as a therapeutic vasodilator in the treatment of cardiovascular disease.

TNG is a chemically stable solid at temperatures below 13.5°C and may be stored below 50°C for many years. At 50-60°C it rapidly volatilizes and decomposes.

TNG is produced for the military at selected Army ammunition plants.

Information on the environmental fate of TNG is not available. However, TNG dissolves in wastewater, is incompletely transformed by bacteria, and has been shown to be toxic to microflora in activated sludge.

PHARMACOKINETICS

TNG is rapidly and completely absorbed following ingestion by rats, mice, and dogs and is distributed mainly to liver, skeletal muscles, and kidneys in these species. Excretion of radiolabeled TNG and its metabolites is primarily in urine. TNG is almost completely transformed in the body, but the role of the liver or other organs in its biotransformation is not established.

HEALTH EFFECTS

Humans

Data gathered from clinical and occupational studies indicate that sublingual, dermal, or inhalation exposures cause severe headaches, flushing, postural hypotension, psychic disturbances, convulsions, difficulty in breathing, and cyanosis (a bluish discoloration of the skin). Death is often due to respiratory failure. With repeated exposures, tolerance may develop to some adverse effects.

Occupational health surveys of workers at an Army ammunition plant indicated that atmospheric TNG levels of 0 to 12.5 mg/m^3 cause ischemic heart disease, chest pain, headaches, rash, and death. Other occupational studies found reduced blood pressure, peripheral circulatory disorders, Raynauds phenomena, peripheral neuropathy, and severe coronary sclerosis.

Although TNG has been used extensively as a therapeutic vasodilator, there are no reports of carcinogenicity in humans.

HEALTH EFFECTS

Experimental Animals

Tests in rabbits show that TNG is a very mild skin irritant but not an eye irritant. In guinea pigs, TNG is a moderate skin irritant.

The only adverse effects observed in 4-week oral studies of TNG toxicity in rats, mice, and dogs were decreased food consumption and weight gain.

After 13 weeks of oral exposure to TNG, the only significant effect observed in rats, mice, and dogs was elevated SGOT levels in high-dose rats.

The toxic effects of 12-24 month dietary exposures to TNG in rats, mice, and dogs included decreased weight gain and food consumption in rats and mice and pathologic changes in blood in all three species and in liver and testes of rats.

Reproductive effects in rats were attributed to TNG induced testicular tumors and malnutrition.

TNG is weakly mutagenic in some strains of *Salmonella*. It is not mutagenic in yeast and mammalian assays.

In a 24-month study, rats exposed to TNG in their diets exhibited liver carcinomas and tumors of the testes.

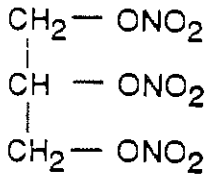
OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

Methods for the analysis of TNG below 10 parts per million in aqueous solutions include high pressure liquid chromatography followed by ultraviolet detection of nitrate esters and gas-liquid chromatography using electron capture. Other methods are available for analysis of high concentrations of TNG in water.

Treatment technologies for the removal of TNG in wastewater include activated sludge with lime pretreatment and hydrolysis using ethanol or $Ca(OH)_2$. Biotransformation studies show that bacteria incompletely degrade TNG.

Physical and Chemical Properties

Empirical Formula	$C_3H_5(NO_3)_3$
Synonyms	TNG, 1,2,3-Propanetriol trinitrate, Glyceryl trinitrate, Trinitroglycerol, Nitroglycerin, Trinitrin
CAS Number	55-63-0
Physical State	Pale yellow, viscous liquid
Molecular Weight	227.09
Boiling Point	145°C
Melting Point	13.5°C
Specific Gravity	1.592 at 20°C
Vapor Pressure	2.6×10^{-4} mm Hg at 20°C
Solubility	In water: 0.18% w/v. In ethanol: 25% w/w.
Flash Point	256°C
Autoignition	250-260°C



Health Effects Data and Advisory Values

Genotoxicity	Results in *in vitro Salmonella typhimurium* tests were negative to weakly genotoxic. Negative in *in vitro* Chinese hamster ovary assays. Negative in *in vivo* bone marrow and kidney cells (rat), dominant lethal (rat), and kidney cells and lymphocytes (dog and rat).	
Reproductive and Developmental Effects	Severe infertility observed in a three-generation reproduction study in rats was attributed to TNG-induced testicular tumors and malnutrition. Results of teratological studies were inconclusive.	
Cancer Classification	Not classified by EPA.	
Reference Dose (RfD)	Not determined	
Drinking Water Equivalent Level (DWEL)	Not determined	
Health Advisory Values	One-Day	0.005 mg/L
	Ten-Day	0.005 mg/L
	Longer-Term	0.005 mg/L
	Lifetime	0.005 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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401 M Street, SW
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June 17, 1991

TRINITROTOLUENE (TNT)

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Trinitrotoluene or, more specifically, *alpha*-TNT, is the common designation for 2,4,6-dinitrotoluene, the most widely used military high-explosive.

TNT is chemically stable and is known to withstand storage for 20 years. Its stability is unaffected by moisture.

Production of TNT from 1969-1971 was reported at 45 million pounds per month. TNT wastes are classified as "red water" and "pink water". Spent washings from the sellite purification process used in TNT production—with a high TNT solids content—are called red water. Pink water comes from filter effluents, scrubber discharges, spent acid recovery wastes, washout operations, and the evaporation of condensate from the concentration of red water.

The environmental fate of TNT in wastewater is most notably influenced by its degradation by photolysis and biotransformation. Photolysis of TNT waste is the primary process for the loss of TNT from the environment. In soil, adsorption and molecular diffusion affect its migration.

HARMACOKINETICS

TNT is absorbed by inhalation, ingestion, or skin contact, rapidly biotransformed in the liver, and excreted mainly in the urine. Less than 1% is distributed to other tissues. Rapid clearance precludes extensive bioaccumulation. TNT is well absorbed (more than 50% of administered dose) in a variety of test species. Several urinary metabolites have been identified.

HEALTH EFFECTS

Humans

Exposure data gathered through occupational health surveys conducted at Army Ammunition Plants indicated that atmospheric exposure to TNT at levels ranging from 0.02 to 3.0 mg/m³ for periods up to 6 months caused abnormalities in the blood (increased white blood cell count and a reduction in hematocrit, hemoglobin, and red blood cells).

Exposure can cause a yellow discoloration of the skin, nails, and hair; a bluish discoloration of the mucosa; epigastric pain, tenderness, or spasm; enlarged and palpable liver, and changes in electrocardiogram and electroencephalogram. An amber to deep red color to the urine is also characteristic of exposure.

Initial exposure to TNT in the atmosphere may result mild irritation of the respiratory passages and skin, and gastrointestinal distress. Absorption of sufficient amounts of TNT through the skin or lungs can produce signs of cyanosis, aplastic anemia, cataract formation, menstrual disorders, neurological manifestations, and nephrotoxicity. Toxic hepatitis and aplastic anemia are reported to be the principal causes of death following TNT intoxication.

HEALTH EFFECTS

Experimental Animals

Tests in rabbits indicated that TNT is a mild skin irritant but not an eye irritant. In guinea pigs it was shown to be a moderate skin sensitizing agent.

Studies in rats, mice, and dogs fed TNT for periods up to four weeks showed early but not persistent decreases in body weight and food intake, red pigmented urine, splenic hemosiderosis, some anemia, and testicular atrophy.

Effects seen in studies conducted in rats, mice, dogs, and monkeys for periods of 13 weeks to 2 years included dose-related reductions in body weight and food intake, anemia, and red pigmented urine. Liver, spleen, and testes were also affected.

The toxic effects of lifetime exposure to TNT in rats and mice included anemia, increase in platelets, lymphocytes and white blood count, focal to multifocal myelofibrosis of the bone marrow, and splenic, renal, and liver injury.

Hyperplasia, papilloma, and carcinomas of the urinary bladder occurred in rats in a 24 month study.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

The American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour time-weighted average Threshold Limit Value for exposure to TNT is 0.5 mg/m³. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit remains at 1.5 mg/m³. The U.S. Navy Bureau of Medicine and Surgery established a target interim Maximum Contaminant Level of 0.05 mg/L of TNT in drinking water.

Methods for the analysis of TNT in wastewater include colorimetry, spectrophotometry, gas chromatography, liquid chromatography, and HPLC.

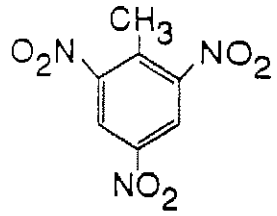
Treatment technologies for the removal of TNT in wastewater include, for red water, molten salt bath reduction process, carbonate process, pyrolysis reduction process, and sulfite recovery process. For the treatment of pink water, absorption by activated carbon has been widely practiced.

Incineration is also used to destroy red water concentrate and the spent carbon from pink water treatment.

Development of photolysis-based treatment methods is underway.

Physical and Chemical Properties

Empirical Formula	$C_7H_5N_3O_6$
Synonyms	TNT, alpha-Trinitrotoluol, 1-Methyl-2,4,6-trinitrobenzene, Trotyl, Tolite, Triton, Tritol, Trilite, *alpha*-TNT
CAS Number	118-96-7
Physical State	Yellow to white crystals
Molecular Weight	227.13
Boiling Point	210°C (10mm Hg) to 212°C (12mm Hg)
Melting Point	80.1-81.6°C
Liquid Density	1.465 g/cm^3
Solubility (at 20°C)	In water: 0.013 g/100 g. In carbon tetrachloride: 0.65 g/100 g. In toluene: 55 g/100 g. In acetone: 109 g/100g.
Flash Point	240°C (explodes)



Health Effects Data and Advisory Values

Genotoxicity	Conflicting results *in vitro* in *Salmonella typhimurium*. Frame shift reverse mutations and base pair substitutions in two studies, no effect in another. Negative in *in vitro* studies using *Saccharomyces cerevisiae*, negative for unscheduled DNA synthesis in rat hepatocytes and human diploid fibroblasts, and negative in mouse bone marrow micronucleus assay. *In vivo*, no genetic damage was induced by TNT.
Reproductive and Developmental Effects	Testicular atrophy and hyperplasia were seen in short- and longer-term studies. No other data were available in the literature concerning the reproductive or developmental effects of TNT.
Cancer Classification	EPA Group C, possible human carcinogen based on urinary bladder papilloma and carcinoma in female Fischer 344 rats.
Reference Dose (RfD)	0.0005 mg/kg/day
Drinking Water Equivalent Level (DWEL)	0.02 mg/L
Health Advisory Values	One-Day 0.02 mg/L Ten-Day 0.02 mg/L Longer-Term 0.02 mg/L Lifetime 0.002 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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401 M Street, SW
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June 17, 1991

WHITE PHOSPHORUS

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

White phosphorus (WP) is one of three forms (white, red, black) of elemental phosphorus. It is used by the military as a screening smoke and incendiary device. It is no longer used in matches, fireworks, and rat poison.

Because WP ignites spontaneously in air at 30°C producing a dense white smoke, it must be stored and transported under water.

WP is purchased by the military from commercial sources. Wastewater from WP manufacturing, processing, and transport is the single most important source of environmental contamination.

In the environment, WP readily volatilizes to air from water and soil. Oxidation is the main process for its removal from air. WP is not transformed by photolysis. It is resistant to anaerobic aquatic organisms. Polyphosphates are hydrolyzed by water and soil microorganisms. WP bioaccumulates in fish.

PHARMACOKINETICS

WP is absorbed by inhalation, ingestion, or skin contact, is distributed mainly to the liver, blood, and skeletal muscles, and is excreted primarily in the urine. One of the two metabolic products appears to be inorganic phosphate, the other compound has not been characterized.

HEALTH EFFECTS

Humans

Toxic effects associated with WP, primarily from rat poisons, include death at low doses, nausea, vomiting, garlic-like odor of the breath and excrement, lethargy, convulsions, coma, fatty infiltration of liver and other organs, enlargement of the liver with jaundice, kidney failure, and electrocardiographic changes suggestive of an acute heart attack.

Ocular burns from contact with particulate WP cause reversible eye effects with moderate congestion, while exposure to WP fumes has caused conjunctivitis, photophobia, and lacrimation.

Inhalation exposures have caused a distressed cough, shortness of breath, and hoarseness, but no permanent tissue damage.

Phossy jaw (a disease of the jawbone leading to tissue destruction and infection) is a well-known manifestation of chronic occupational phosphorous exposure.

HEALTH EFFECTS

Experimental Animals

Single oral exposures of mice and rats to WP cause degeneration of the liver, kidneys, and heart.

WP does not cause eye or skin irritation when applied as a weak solution, but higher concentrations produce burns and subsequent systemic toxicity, mainly to the liver and kidneys.

Effects seen in 1-month and 90-day oral exposure studies with rabbits and guinea pigs were marked destruction of liver cells, similar to alcoholic cirrhosis.

Oral exposures of rats for 4 to 6 months caused growth deficiencies.

Toxic effects of lifetime dietary exposures to rats included growth retardation, bone changes, edema of the lungs, and pneumonia.

The results of a two-generation oral reproductive study of rats included increased mortality among high dose parental females. No studies were available regarding potential developmental effects.

No adverse mutagenic effects were reported in *Salmonella* strains.

No potential carcinogenicity effects of WP were observed in a lifetime study in rats.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

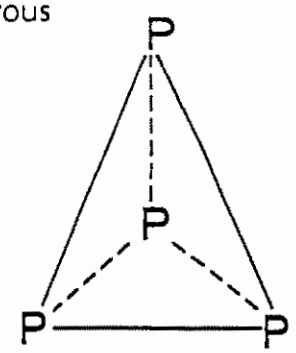
The American Conference of Governmental Industrial Hygienists (ACGIH) 8 hour, time weighted average Threshold Limit Value for WP is 0.1 mg/m^3 for acute poisoning. The National Institute for Occupational Safety and Health (NIOSH) along with the Occupational Safety and Health Administration (OSHA) reported a Permissible Exposure Limit of 0.1 mg/m^3.

Methods for the analysis of WP in water include extraction with benzene and subsequent analysis by colorimetry, gas-liquid chromatography, and neutron activation.

Due to the high reactivity of WP in water, treatment technologies are generally not required. Both suspended and dissolved phosphorous are readily oxidized to lower states of phosphorous in aerated waters. The rate of oxidation can be significantly increased by adding oxidizing agents such as ozone or sodium hypochlorite.

Physical and Chemical Properties

Empirical Formula	P_4
Synonyms	WP, Yellow phosphorous, Elemental phosphorous
CAS Number	12185-10-3 (White phosphorus) 7723-14-0 (Red and white phosphorus)
Physical State	Colorless to yellow, waxy solid
Molecular Weight	123.90
Boiling Point	280°C
Melting point	44.1°C
Specific Gravity	1.82 solid at 20°C 1.74 liquid at 44.5°C
Vapor Pressure	0.04 mm Hg at 25°C
Solubility	In water: 3 mg/L at 15°C. In alcohol: 2.5 g/L. In benzene: 28.5 g/L. In carbon disulfide: 1,250 g/L
Autoignition	30°C (in moist air; higher in dry air)



Health Effects Data and Advisory Values

Genotoxicity	Negative results in *Salmonella typhimurium* strains with and without activation.
Reproductive and Developmental Effects	In a two-litter, one generation reproduction study with rats, increased mortality of parental females was attributed to difficulties during parturition. No information was found in the available literature regarding possible developmental effects.
Cancer Classification	EPA Group D, not classifiable as to human carcinogenicity.
Reference Dose (RfD)	0.000015 mg/kg/day
Drinking Water Equivalent Level (DWEL)	0.0005 mg/L

Health Advisory Values

One-Day	Not recommended
Ten-Day	Not recommended
Longer-Term	Not recommended
Lifetime	0.0001 mg/L

This summary was developed using information from the Drinking Water Health Advisory. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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June 17, 1991

ZINC CHLORIDE

PROFILE OF DRINKING WATER CONTAMINANTS FOR EMERGENCY RESPONSE

GENERAL INFORMATION

Zinc chloride, an inorganic salt of zinc, is produced commercially by the action of hydrochloric acid on zinc, zinc oxide, or zinc sulfide ore. It is a highly deliquescent, white, granular or crystalline substance that is very soluble in water. It is odorless and corrosive in solid form and highly acidic in aqueous solution. Zinc chloride may be released to the environment from a number of industrial processes including galvanizing, wood preserving, soldering, dry-battery cell production, and organic synthesis. In addition, it may be introduced into the environment through the use of military screening smokes, ordinarily hexachoroethane/zinc oxide smokes. In the environment (air and water) zinc chloride readily hydrolyzes, and adsorption of zinc ions to sediment and soils and bioacccumlation of zinc have been reported.

PHARMACOKINETICS

Zinc, administered as zinc chloride, is absorbed moderately well following oral intake but may be saturable. Absorption through the skin is minimal while data on absorption following inhalation of particulate zinc chloride is limited. It distributes mainly to the intestines, prostate, liver and kidney with kidney levels remaining highest after intravenous administration. Zinc is an essential trace nutrient and a cofactor for as many as 200 enzymes. Metallothionein, a storage protein for zinc appears to play an important role in regulating zinc homeostasis. Excretion is mainly through the feces.

HEALTH EFFECTS

Humans

Acute oral exposures of up to 1,000 mg/kg of zinc chloride in solder caused vomiting, diarrhea, lethargy, and irritation of the mouth, throat, and stomach. Acute symptoms of zinc chloride toxicity from inhalation include watery eyes, chest constriction and chest pain, difficulty in breathing, hoarseness, cough, and expectoration. Pale grey cyanosis usually develops, pulse is elevated, fever is present and bronchopneumonia can develop. Edema is widespread. Death is usually due to respiratory insufficiency. Effects are related to the deliquescent nature of the inhaled zinc particles which combine with moisture in the lungs to form caustic substances.

Longer-term oral exposure to zinc (as zinc gluconate) for 6 to 12 weeks reduced serum erythrocyte superoxide dismutase, ceruloplasin and HDL levels.

Contamination of the eye with zinc chloride can cause severe corneal and lens damage.

HEALTH EFFECTS

Experimental Animals

Acute gavage exposures of rats up to 1,000 mg/kg zinc chloride caused lack of coordination, tremor, difficulty in breathing, mucosal damage, perforated stomach, and sometimes death. Data on the long-term effects of zinc chloride exposure are associated with a decreased weight gain in female rats gavaged at 150 mg/kg/day, but no effects on offspring. Dietary zinc chloride revealed no reproductive effects up to 250 mg/kg/day. Oral developmental studies of zinc chloride produced inconclusive results, but an intraperitoneal study suggests zinc chloride causes developmental effects.

Mutagenicity and carcinogenicity studies have yielded equivocal or negative results.

OTHER CRITERIA, ANALYSES, AND TREATMENT TECHNOLOGIES

The American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour Threshold Limit Value and the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit for zinc chloride fumes (averaged over an 8-hour work shift) are set at 1 mg/m^3.

The National Academy of Sciences (NAS) Recommended Daily Allowance for zinc is 5 mg for infants under 1 year of age; 10 mg for children under 10 years; 15 mg for adult males; 12 mg for adult females; 15 mg for pregnant women; and 16-19 mg for lactating women.

Methods for the analysis of zinc in environmental media are based on either emission or absorption spectroscopy and include atomic absorption, graphite furnace atomic absorption, inductively coupled plasma atomic emission, and inductively coupled plasma mass spectroscopy. Neutron activation is used to determine the concentration of zinc in biological samples.

Zinc chloride in water is rapidly hydrolyzed to zinc ions and chloride ions and no specific treatment of water for removal of zinc chloride is necessary. Reverse osmosis, chemical coagulation and possibly ion exchange will significantly reduce zinc levels in drinking water.

Physical and Chemical Properties

Empirical Formula	$ZnCl_2$
Synonyms	Zinc chloride, butter of zinc
CAS Number	7646-85-7
Physical State	White crystals or powder
Molecular Weight	136.29
Melting Point	290°C
Boiling Point	732°C
Specific Gravity	2.91
Solubility	In water, 432 g/100mL at 25°C.

Health Effects Data and Advisory Values

Genotoxicity

Zinc chloride was not mutagenic in a variety of bacterial and *in vitro* mammalian cell systems. Zinc chloride did not cause chromosomal aberrations in mouse bone marrow cells when administered in an *in vivo* assay.

Reproductive and Developmental Effects

Although high doses of various forms of zinc can interfere with reproductive function at doses as low as 25 mg/kg/day and are fetotoxic, the results of oral studies of zinc chloride are inconclusive.

Cancer Classification

EPA Group D, not classifiable as to human carcinogenicity.

Reference Dose (RfD)

0.3 mg/kg/day

Drinking Water Equivalent Level (DWEL)

10 mg/L

Health Advisory Values

One-Day	5 mg/L
Ten-Day	5 mg/L
Longer-Term (child)	3 mg/L
Longer-Term (adult)	12 mg/L
Lifetime	2.0 mg/L

This summary was developed using information from the Drinking Water Health Advisory. A copy of the Health Advisory is available from the National Technical Information Service at (703) 487-4650. The order number for the Zinc Chloride Health Advisory is PB93-136620. For further information contact EPA's Office of Science and Technology at (202) 260-7571.

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March 23, 1993

APPENDIX G

APPENDIX G

Health-Based Criteria for Systemic Toxicants

Source: Reference 22

APPENDIX G

Health-Based Criteria for Systemic Toxicants

Source: Reference 22

Table 8-7. Health-Based Criteria for Systemic Toxicants[1]

Constituent	CAS No.	RfD[2] (mg/kg/day)	Soil (mg/kg)	Water (µg/l)	Air (µg/m³)
Acetone	67-64-1	1E-01	8E+03	4E+03	–
Acetonitrile	75-05-8	6E-03	5E+02	2E+02	–
Acetophenone	98-86-2	1E-01	8E+03	4E+03	–
Aldicarb	116-06-3	1E-03	8E+01	4E+01	5E+00
Aldrin	309-00-2	3E-05	2E+00	1E+00	–
Allyl alcohol	107-18-6	5E-03	4E+02	2E+02	–
Aluminum phosphide	20859-73-8	4E-04	3E+01	1E+01	–
Antimony	7440-36-0	4E-04	3E+01	1E+01	–
Barium	7440-39-3	5E-02	4E+03	See MCL	–
Barium cyanide	542-62-1	7E-02	6E+03	2E+03	–
Benzidine	92-87-5	2E-03	2E+02	7E+01	–
Beryllium	7440-41-7	5E-03	4E+02	2E+02	–
Bis(2-ethylhexyl) phthalate	117-81-7	2E-02	2E+03	7E+02	–
Bromodichloromethane	75-27-4	2E-02	2E+03	7E+02	7E+01
Bromoform	75-25-2	2E-02	2E+03	7E+02	–
Bromomethane	74-83-9	4E-04	3E+01	1E+01	–
Calcium cyanide	592-01-8	4E-02	3E+03	1E+03	–
Carbon disulfide	75-15-0	1E-01	8E+03	4E+03	–
Carbon tetrachloride	56-23-5	7E-04	6E+01	See MCL	–
Chlordane	57-74-9	5E-05	4E+00	2E+00	–
Chlorine cyanide	506-77-4	5E-02	4E+03	2E+03	–
Chlorobenzene	108-90-7	3E-02	2E+03	1E+03	–
1-Chloro-2,3 epoxypropane (Epichlorohydrin)	106-89-8	2E-03	2E+02	7E+01	–
Chloroform	67-66-3	1E-02	8E+02	4E+02	–
Chromium (III)	16065-83-1	1E+00	8E+04	4E+04	–
Chromium (VI)	7440-47-3	5E-03	4E+02	See MCL	–
Copper cyanide	544-92-3	5E-03	4E+02	2E+02	–
Cresols	1319-77-3	5E-02	4E+03	2E+03	–
Crotonaldehyde	123-73-9	1E-02	8E+02	4E+02	–
Cyanide		2E-02	2E+03	7E+02	–
Cyanogen	460-19-5	4E-02	3E+03	1E+03	–
2,4-D	94-75-7	1E-02	8E+02	See MCL	–
DDT	50-29-3	5E-04	4E+01	2E+01	–
Di-n-butylphthalate	84-74-2	1E-01	8E+03	4E+0	–

Note: These criteria are subject to change and will be confirmed by the regulatory agency prior to use.

Table 8-7. (continued)[1]

Constituent	CAS No.	RfD[2] (mg/kg/day)	Soil (mg/kg)	Water (µg/l)	Air (µg/m³)
2,3,4,6-Tetrachlorophenol	58-90-2	3E-02	2E+03	1E+03	1E+02
Tetraethyllead	78-00-2	1E-07	8E-03	4E-03	4E-04
Thallic oxide	1314-32-5	4E-04	3E+01	1E+01	--
Thallium acetate	563-68-8	5E-04	4E+01	2E+01	--
Thallium carbonate	6533-73-9	4E-04	3E+01	1E+01	--
Thallium chloride	7791-12-0	4E-04	3E+01	1E+01	--
Thallium nitrate	10102-45-1	5E-04	4E+01	2E+01	--
Thallium selenite	12039-52-0	5E-04	4E+01	2E+01	--
Thallium sulfate	10031-59-1	3E-04	2E+01	1E+01	--
Thiram	137-26-8	5E-03	4E+02	2E+02	--
Toluene	108-88-3	3E-01	2E+04	1E+04	--
1,2,4-Trichlorobenzene	120-82-1	2E-02	2E+03	7E+02	--
1,1,1-Trichloroethane	71-55-6	9E-02	7E+03	See MCL	--
1,1,2-Trichloroethane	79-00-5	2E-01	2E+04	7E+03	--
Trichloromonofluoromethane	75-69-4	3E-01	2E+04	1E+04	--
2,4,5-Trichlorophenol	95-95-4	1E-01	8E+03	4E+03	4E+02
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	93-76-5	3E-03	2E+02	See MCL	--
1,1,2-Trichloropropane	598-77-6	5E-03	4E+02	2E+02	--
1,2,3-Trichloropropane	96-18-4	1E-03	8E+01	4E+01	--
Vanadium pentoxide	1314-62-1	2E-02	2E+03	7E+02	--
Warfarin	81-81-2	3E-04	2E+01	1E+01	--
Xylene (total)	1330-20-7	2E+00	2E+05	7E+04	--
Zinc cyanide	557-21-1	5E-02	4E+03	2E+03	--
Zinc phosphide	1314-84-7	3E-04	2E+01	1E+01	--

1 These criteria are subject to change and will be confirmed by the regulatory agency prior to use.

2 See Table 8-2 for the appropriate intake assumptions used to derive these criteria.

APPENDIX H

APPENDIX H

Photographic Log for Solid Waste Management Units

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
1	1	9/14/90	View of the Hazardous Waste Container Storage Facility - Building 307, facing northeast.
2	1	11/27/90	View of the monolithic concrete slab floor and 6-inch curb-Building 307, facing south.
3	1	11/27/90	Interior of the Hazardous Waste Container Storage Facility-Building 307, facing northeast.
4	1	11/27/90	Interior of the Hazardous Waste Container Storage Facility-Building 307, facing southeast.
5	2	9/13/90	View of the PCB Transformer Storage Area - Building 301, facing southeast.
6	2	9/11/90	Interior of the PCB Transformer Storage Area - Building 301, facing south.
7	3	9/10/90	View of the Incinerator Cooling Water Pond, facing north.
8	4	11/29/90	View of the Munitions Washout Facility Leach Field, facing northeast.
9	4	9/13/90	View of the Munitions Washout Facility Leach Field, facing south.
10	4	11/29/90	View of the drainage ditch at the Munitions Washout Facility Leach Field, facing northwest.
11	4	9/11/90	View of the pond which collects the drainage from the Munitions Washout Facility Leach Field, facing west.
12	4	9/11/90	View of the drainage ditch from the Munitions Washout Facility Leach Field, leading to the pond, facing northeast.
13	4	9/11/90	Close-up of the drainage ditch from the Munitions Washout Facility Leach Field, leading to the pond, facing northeast.
14	5	9/13/90	View of the Sewage Sludge Waste Piles, facing southeast.
15	5	9/13/90	View of the Sewage Sludge Waste Piles, facing south.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
16	5	9/13/90	Close-up of a Sewage Sludge Waste Pile, facing south.
17	6	9/10/90	View of the Abandoned Ash Landfill, facing east.
18	6	9/10/90	View of the Abandoned Ash Landfill, facing northeast.
19	6 and 15	9/14/90	View of the Abandoned Ash Landfill (SEAD-6) and the Abandoned Solid Waste Incinerator - Building 2207 (SEAD-15), facing northwest.
20	7	9/13/90	View of the Shale Pit, facing southwest.
21	8	9/14/90	View of the Non-Combustible Fill Area, facing southeast.
22	9	9/12/90	View of the Old Scrap Wood Site, facing northwest.
23	9	9/12/90	Close-up of the Old Scrap Wood Site, facing northwest.
24	9	9/12/90	Close-up of the Old Scrap Wood Site, facing northwest.
25	10	9/12/90	View of the west pile of the Present Scrap Wood Site, facing south.
26	10	9/12/90	Close-up of the west pile of the Present Scrap Wood Site, facing southwest.
27	10	9/12/90	View of the middle pile of the Present Scrap Wood Site, facing south (wooden pallet disposal area).
28	10	9/12/90	View of the east pile of the Present Scrap Wood Site, facing south (pressure treated wood and pole sales area).
29	11	9/14/90	View of the Old Construction Debris Landfill, facing west.
30	11	9/14/90	Close-up of the Old Construction Debris Landfill, facing west.
31	12	9/12/90	View of Location A of the Radioactive Waste Burial Sites, facing west.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
32	12	9/12/90	View of Location B of the Radioactive Waste Burial Sites, facing northeast; the person in the foreground is standing at the approximate location of the 5,000 gallon Underground Storage Tank; the person in the background is standing in the proximity of the Dry Storage Pit.
33	13	9/11/90	View of one possible location of the IRFNA Disposal Site (south of East-West Base Line Road), facing south.
34	13	9/11/90	View of one possible location of the IRFNA Disposal Site (under the Duck Ponds; south of East-West Base Line Road) facing west; the possible site is located at the left side of the photograph, in the southern part of the pond.
35	13	11/27/90	View of possible location of the IRFNA Disposal Site, facing east; the possible site is located to the right side of the fence, in the southern part of the pond.
36	13	11/27/90	View of the aboveground piping observed on the southwest side of the Duck Ponds, facing north. The piping may be the deluge shower referred to in the 1960 IRFNA Disposal Report. Similar piping was observed on the southeast side of the Duck Ponds.
37	13	11/27/90	View of the aboveground piping observed in the general area of the IRFNA Disposal Site, facing north towards East-West Base Line Road, on the east side of the Duck Ponds.
38	13	11/27/90	Close-up of the aboveground piping shown in Photograph 37, facing south.
39	14	9/14/90	View of the Refuse Burning Pits, facing northeast; the orange flagging shows the approximate location of the pits.
40	15	9/10/90	View of the Abandoned Solid Waste Incinerator - Building 2207, facing northwest.
41	15	9/10/90	View of the Abandoned Solid Waste Incinerator - Building 2207, facing northwest.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
42	16	9/11/90	View of the Abandoned Deactivation Furnace - Building S-311, facing southeast.
43	16	9/13/90	View of the Abandoned Deactivation Furnace - Building S-311, facing southwest.
44	16	9/13/90	View of the Abandoned Deactivation Furnace - Building S-311, facing northwest.
45	16	9/13/90	Interior of the Abandoned Deactivation Furnace - Building S-311; the doorway on the south wall is the entrance to the furnace room.
46	16	9/13/90	Interior of the Abandoned Deactivation Furnace - Building S-311, facing south towards the furnace room (close-up).
47	16	9/13/90	Interior of the Abandoned Deactivation Furnace - Building S-311, facing north away from the furnace room.
48	16	9/13/90	Interior of the Abandoned Deactivation Furnace - Building S-311, facing south, (view of the room adjacent to the furnace room).
49	16	9/13/90	Interior of the Abandoned Deactivation Furnace - Building S-311, facing south, (view of the room adjacent to the furnace room).
50	17	9/11/90	View of the Existing Deactivation Furnace - Building 367, facing northeast.
51	18	9/13/90	View of the Classified Document Incinerator - Building 709, facing southeast.
52	18	9/13/90	Close-up of the Classified Document Incinerator - Building 709, facing east.
53	20	9/11/90	View of the Sewage Treatment Plant No. 4, facing north.
54	20	9/11/90	View of the sludge drying beds - Sewage Treatment Plant No. 4, facing northeast.
55	20	9/11/90	View of the east half of the Imhoff tank - Sewage Treatment Plant No. 4, facing south.
56	20	9/11/90	View of the sludge storage area - Sewage Treatment Plant No. 4, facing southwest.
57	21	9/13/90	View of the Sewage Treatment Plant No. 715, facing southwest.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
58	21	9/13/90	View of Primary Treatment - Sewage Treatment Plant No. 715, facing east.
59	21	9/13/90	View of one of the two sludge drying beds of the Sewage Treatment Plant No. 715, facing southeast.
60	21	9/13/90	View of the final treatment - Sewage Treatment Plant No. 715, facing west.
61	21	9/13/90	View of the effluent from Sewage Treatment Plant No. 715, facing west.
62	22	9/13/90	View of Sewage Treatment Plant No. 314, facing north.
63	22	9/13/90	View of the trickling filter, Sewage Treatment Plant No. 314, facing south.
64	22	9/13/90	View of the trickling filter, Sewage Treatment Plant No. 314, facing southeast.
65	22	9/10/90	View of the location of the former sludge drying beds, Sewage Treatment Plant No. 314, facing west (the concrete in the foreground indicates the approximate location).
66	23	9/11/90	View of one of the nine burning pads - Open Burning Ground, facing southeast.
67	23	9/11/90	View of the current burning tray of the Open Burning Ground, facing southeast.
68	23	9/11/90	View of one of the nine burning pads - Open Burning Ground, facing south.
69	24	9/10/90	View of the Abandoned Powder Burning Pit, facing south.
70	24	9/10/90	View of the Abandoned Powder Burning Pit, facing south.
71	25	9/14/90	View of the Fire Training and Demonstration Pad, facing southwest.
72	25	9/14/90	View of the Fire Training and Demonstration Pad, facing west.
73	25	9/14/90	View of the Fire Training and Demonstration Pad, facing northwest.
74	26	9/11/90	View of the Fire Training Pit, facing west.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
75	26	9/11/90	View of the Fire Training Pit Area, facing northwest.
76	26	9/11/90	View of the Fire Training Pit Area, facing north.
77	26	9/11/90	View of the Fire Training Pit Area, facing south.
78	26	11/27/90	View of the debris area located south of the Fire Training Pit, facing south.
79	26	11/27/90	View of the debris area located south of the Fire Training Pit, facing south.
80	27	9/12/90	View of Building 360, the location of the Steam Cleaning Waste Tank, facing north.
81	27	9/12/90	View of the Steam Cleaning Waste Tank - Building 360, facing west.
82	27	9/12/90	Close-up of the Steam Cleaning Waste Tank - Building 360, facing west.
83	28	9/12/90	View of the location of two Underground Waste Oil Tanks - Building 360, facing east.
84	28	9/12/90	View of the location of two Underground Waste Oil Tanks - Building 360, facing northeast.
85	28	9/12/90	Close-up of the location of the left Underground Waste Oil Tank, facing northeast.
86	28	9/12/90	Close-up of the right Underground Waste Oil Tank, facing northeast.
87	29	9/13/90	View of the location of the Underground Waste Oil Tank - Building 732, facing northwest.
88	30	9/13/90	View of the location of the Underground Waste Oil Tank - Building 118, facing north.
89	31	9/12/90	View of the location of Underground Waste Oil Tank - Building 117, facing northeast.
90	31	9/12/90	Close-up of the location of Underground Waste Oil Tank - Building 117, facing northeast.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
91	32	9/13/90	View of the location of the 20,000 gallon Underground Waste Oil Tank - Building 718, facing north.
92	32	9/13/90	View of the location of the 40,000 gallon Underground Waste Oil Tank - Building 718, facing southwest.
93	33	9/13/90	View of the location of Underground Waste Oil Tank - Building 121, facing east.
94	33	9/13/90	Close-up of the location of Underground Waste Oil Tank - Building 121, facing east.
95	34	9/12/90	View of the location of two Underground Waste Oil Tanks - Building 319, facing east.
96	34	9/12/90	View of the location of two Underground Waste Oil Tanks - Building 319, facing northeast.
97	35 and 41	9/13/90	View of Building 718, where three Waste Oil - Burning Boilers are located, facing south; the Boiler Blowdown Leach Pit (SEAD-41) is located in the vicinity of the building.
98	35	9/13/90	View of the most easterly and central boilers of the three Waste Oil - Burning Boilers - Building 718, facing south.
99	35	9/13/90	View of the central and most westerly boilers of the three Waste Oil - Burning Boilers - Building 718, facing south.
100	36 and 39	9/12/90	View of Building 121, where two Waste Oil - Burning Boilers are located, facing west; the Boiler Blowdown Leach Pit (SEAD-39) is located in the vicinity of the building.
101	36	9/12/90	View of two Waste Oil - Burning Boilers - Building 121, facing northwest. The largest boiler is a coal fired unit that has never burned waste oil.
102	37 and 40	9/12/90	View of Building 319, where two Waste Oil - Burning Boilers are located, facing northeast; the Boiler Blowdown Leach Pit (SEAD-40) is located in the vicinity of the building.
103	37	9/12/90	View of Waste Oil - Burning Boiler - Building 319, facing northeast.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
104	37	9/12/90	View of Waste Oil - Burning Boiler - Building 319, facing west.
105	38	9/13/90	View of Building 2079, in the vicinity where the Boiler Blowdown Leach Pit is located, facing south.
106	42	9/14/90	View of Building 106, where the Preventive Medicine Laboratory is located, facing southeast.
107	42	9/14/90	View of the Clinical Analysis Laboratory - Building 106, facing east.
108	44	9/13/90	View of Location A of the Quality Assurance Test Laboratory, facing south.
109	44	9/13/90	Close-up of Location A of the Quality Assurance Test Laboratory, facing south.
110	44	11/29/90	View of Location B of the Quality Assurance Test Laboratory, facing west.
111	44	11/29/90	View of the shed shown in the background of Photograph 111, facing east.
112	44	11/29/90	Interior of the shed shown in photograph 112, facing east.
113	44	11/29/90	View of Location B of the Quality Assurance Test Laboratory, facing east.
114	45	9/11/90	View of the detonation grounds - Open Burning Ground, facing northwest.
115	46	9/13/90	View of the Small Arms Range Area, facing east.
116	46	9/13/90	View of the Small Arms Range Area, facing north.
117	49	11/29/90	View of the Columbite Ore Storage facility - Building 356.
118	49	11/29/90	Close-up of the Columbite Ore-Building 356.
119	50	9/12/90	View of the Tank Farm, facing southwest.
120	50	9/12/90	View of the Asbestos Tank located at the Tank Farm, facing north.
121	50	9/12/90	View of the Sulfide Ore Tank (Tank No. 8) located at the Tank Farm, facing north.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
122	50	9/12/90	View of the Sulfide Ore Tank (Tank No. 17) located at the Tank Farm, facing north.
123	50	9/12/90	View of the Rutile Ore Tank located at the Tank Farm, facing north.
124	52	9/11/90	View of the Ammunition Breakdown Area - Building 612, facing north.
125	52	9/13/90	View of the Ammunition Breakdown Area - Building 612, facing south.
126	52	9/13/90	View of the Ammunition Breakdown Area - Building 608, facing southwest.
127	55	9/12/90	View of the Tannin Storage Area - Building 357, facing east.
128	55	11/29/90	View of the Tannin Storage Area - Building 357.
129	56	9/12/90	View of the Herbicide and Pesticide Storage Area - Building 606, facing north.
130	56	9/12/90	Close-up of the signs posted on the Herbicide and Pesticide Storage Area , facing north.
131	56	9/12/90	Stressed vegetation located close to the Herbicide and Pesticide Storage Area - Building 606, facing north.
132	56	9/12/90	Pesticide Rinseate Building located west of the Herbicide and Pesticide Storage Building, facing west.
133	56	11/28/90	Below ground concrete pesticide rinsate collection vault, Herbicide and Pesticide Storage Area - Building 606, facing southwest.
134	56	9/12/90	View of the septic tank system, Herbide and Pesticide Storage Area - Building 606, facing south.
135	56	11/28/90	View of the Mixing Area Room, Herbicide and Pesticide Storage Area - Building 606, facing west.
136	56	11/28/90	View of the Herbicide Storage Room, Herbicide and Pesticide Storage Area - Building 606, facing east.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
137	56	11/28/90	View of the Herbicide Storage Room, Herbicide and Pesticide Storage Area - Building 606, facing west.
138	56	11/28/90	View of the Pesticide Storage Room, Herbicide and Pesticide Storage Area - Building 606, facing south.
139	56	11/28/90	View of the Pesticide Storage Room, Herbicide and Pesticide Storage Area - Building 606, facing southeast.
140	56	11/28/90	View of the Bulk Storage and Suspended Registration Room, Herbicide and Pesticide Storage Area - Building 606, facing west.
141	56	11/28/90	View of the emergency shower's sealed drain, Herbicide and Pesticide Storage Area - Building 606, facing west.
142	56	11/28/90	View of the ventilation system located in the front hallway of the Herbicide and Pesticide Storage Area - Building 606, facing south.
143	57	9/12/90	View of the Explosive Ordnance Disposal Area, facing south.
144	57	9/12/90	Close-up of the Explosive Ordnance Disposal Area, facing east.
145	57	9/12/90	Close-up of the Explosive Ordnance Disposal Area, facing southeast.
146	58	9/13/90	View of the Booster Station - Building 2131, facing east.
147	59	9/11/90	View of the Fill Area - West of Building 135, facing northwest.
148	59	9/11/90	View of the Fill Area - West of Building 135, facing northwest.
149	59	9/11/90	View of the Fill Area - West of Building 135, facing northeast.
150	60	9/13/90	View of Oil Discharge - Building 609, facing north.
151	60	9/13/90	View of Oil Discharge - Building 609, facing north.
152	60	9/11/90	Close-up of Oil Discharge - Building 609, facing northeast.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
153	60	9/11/90	Close-up of Oil Discharge - Building 609, facing northeast.
154	61	9/13/90	View of Underground Waste Oil Tank - Building 718, facing southeast.
155	62	9/11/90	View of the location of the Nicotine Sulfate Disposal Area - on south side of road near Buildings 606 and 612, facing east.
156	63	9/12/90	View of the location of the Miscellaneous Components Burial Site, facing north.
157	63	9/12/90	View of the location of the Miscellaneous Components Burial Site, facing northwest; the tape is held across the north-south dimension of the burial site.
158	64	11/27/90	View of Location A of Garbage Disposal Areas, Debris Landfill south of Storage Pad, facing south.
159	64	11/27/90	View of Location A of Garbage Disposal Areas, Debris Landfill south of Storage Pad, facing north.
160	64	11/29/90	View of Location B of Garbage Disposal Areas, Debris Area south of Classification Yards, facing north.
161	64	11/29/90	View of Location B of Garbage Disposal Areas, Debris Area south of Classification Yards, facing east.
162	64	11/29/90	View of Location C of Garbage Disposal Areas, Proposed Landfill Site, facing northwest.
163	64	11/29/90	View of groundwater monitoring well, Location C of Garbage Disposal Areas, Proposed Landfill Site, facing northwest.
164	64	11/29/90	View of Location D of Garbage Disposal Areas, Disposal Area west of Building 2203, facing southwest.
165	64	11/29/90	View of Location D of Garbage Disposal Areas, Disposal Area west of Building 2203, facing southwest.
166	65	11/29/90	View of Location A of Acid Storage Area, facing west.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
167	65	11/29/90	View of concrete foundation, Location A, Acid Storage Area.
168	65	11/29/90	View of Location B of Acid Storage Area, facing northeast.
169	65	11/29/90	View of concrete foundation, Location B, Acid Storage Facility.
170	65	11/29/90	View of Location C of Acid Storage Area, facing southeast.
171	65	11/29/90	Close-up of Location C of Acid Storage Area, facing east.
172	66	11/29/90	View of possible Pesticide Storage Area near Buildings 5 and 6 (Building 5 is the white block structure located in back of Building 6), facing north.
173	66	11/29/90	View of possible Pesticide Storage Area near Building 5, facing north.
174	66	11/29/90	Close-up of possible Pesticide Storage Area near Building 5, facing north.
175	66	11/29/90	Close-up of possible Pesticide Storage Area near Building 6, facing northwest.
176	67	11/29/90	View of Dump Site east of Sewage Treatment Plant No. 4, facing south.
177	67	11/29/90	View of Dump Site east of Sewage Treatment Plant No. 4, facing east.
178	68	11/27/90	View of Pest Control Shop - Building S-335 (Old Firehouse), facing northeast.
179	68	11/27/90	View of Pest Control Shop - Building S-335 (Old Firehouse), facing south.
180	68	11/27/90	View of Pest Control Shop - Building S-335 (Old Firehouse), facing east.
181	68	11/27/90	View of interior of Pest Control Shop - Building S-335 (Old Firehouse), facing southwest.
182	69	11/28/90	View of Disposal Area - Building 606, facing north.
183	69	11/28/90	View of Disposal Area - Building 606, facing east.

PHOTO LOG

Photo No.	SWMU (SEAD) No.	Date	Description
184	69	11/29/90	Close-up of Disposal Area - Building 606, facing east.
185	69	11/29/90	Close-up of Disposal Area - Building 606, facing east.

PHOTOLOG

Photo No.	SWMU (SEAD) No.	Date	Description
186	70	4-5-94	View of the filled area near Building 2110, facing southwest.
187	70	4-5-94	View of the western portion of the filled area and a portion of Building 2110, facing south.
188	71	4-4-94	View of the Alleged Paint Disposal Area beyond first set of railroad tracks, facing south.
189	71	4-4-94	Close-up view of the Alleged Pain Disposal Area, facing southeast.
190	72	4-4-94	View of Building 803, the Mixed Waste Storage Facility, facing north.
191	72	4-4-94	View of Building 803, the Mixed Waste Storage Facility, facing south.

APPENDIX I

APPENDIX I

Limited Sampling Analytical Data

ENGINEERING-SCIENCE, INC.

Prudential Center • Boston, Massachusetts 02199 • (617) 859-2000 • Fax: (617) 859-2043

November 15, 1993
720517-03000

Mr. Kamal Gupta, Senior Engineer
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation (NYSDEC)
50 Wolf Road
Albany, NY 12233-7010

Dear Mr. Gupta:

As a part of the Solid Waste Management Unit (SWMU) Classification Study update, Engineering-Science, Inc. (ES) will be conducting a limited sampling program at the Seneca Army Depot Activity (SEDA) for SWMUs numbered SEAD-32, 33, 34, 38, 39, 40, 41, 52, and 66. The purpose of this sampling will be to collect additional data which will be used to determine whether or not a SWMU can be classified as a No-Action SWMU or if a Site Investigation (SI) study is required. Per your letter of September 21, 1993, SEAD-10 and SEAD-49 have now been classified as No Action SWMUs and no limited sampling is required.

No sampling will be performed at the following SWMUs: SEAD-28, 29, 30 and 31, which are all underground waste oil tanks. Instead, the previous tank tightness test results will be summarized and presented as part of the revised SWMU Classification Report. No additional tank tightness tests will be performed. A determination of the classification of these SWMUs will be made from this information. SEAD 51, (the perimeter of the high security area) is also not addressed in this plan. Previous surface soil sampling conducted at SEAD- 51 detected low residual concentrations of herbicides, typical of what could be found at many agricultural areas and golf course throughout the state. The herbicides listed are commonly used, and are designed to leave a residual concentration by their nature. This fenceline area was herbicided using restricted-use herbicides, using licensed applicators. These operations were in compliance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Furthermore, the ecological assessment for the Open Burning Grounds showed diverse populations of species, including contaminant-sensitive species, in Reeder Creek. Reeder Creek drains 50% of the fenceline area. For this reason the Army does not believe that any additional surface soil sampling is required and therefore SEAD 51 should be declared a No Action SWMU.

All sampling will follow ES standard operating procedures and QA/QC procedures, described in previous ES workplans. These approved workplans include: the Ash Landfill, the OB grounds, the 10 and 15 SWMU's. All chemical analyses will be in accordance with NYSDEC Contract Laboratory Program (CLP) Analytical Services Protocols (ASP) and will provide a validatable Level IV data packages.

The following is a brief summary of the work to be performed at each location:

SEAD 32 (Two (2) Waste Oil Tanks at Building 718)

In order to avoid puncturing any existing tanks or lines, Ground Penetrating Radar (GPR) will be performed to determine the boundaries of the underground storage tanks. One boring will be

advanced at the estimated downgradient location midway between the two tanks and one boring will be advanced at the estimated upgradient location midway between the two tanks (see Figure SEAD 32). The downgradient location will be determined in the field, based upon site topography. All borings will be advanced to auger refusal. The borings will be continuously sampled using hollow stem augers and split spoon soil samplers. Each split spoon sampler will be screened in the field with an Organic Vapor Meter (OVM), equipped with a Photoionization Detector (PID). Every split spoon sample will be evaluated for the presence of Volatile Organic Compounds, oil and the depth to water. A soil sample from the split spoon sample at the same boring location which produced the highest OVM field screening result will be retained for analysis. An additional soil sample from another split spoon which contained the most visually stained soil will also be retained for chemical analysis. If no elevated OVM or oil is present in any of the collected split spoon samples, the sample collected at the water table, will be submitted for chemical analysis. If both the highest OVM reading and the most visually,oil stained, sample is identified in different split spoon samples, the sample with the highest OVM reading will be submitted for VOCs and the most visually stained soil will be submitted for Total Recoverable Petroleum Hydrocarbon (TRPH) analysis. In this instance, it may be possible that no soil sample will be collected from the split spoon at the water table. Each boring will then be completed as a monitoring well. Following well development, one groundwater sample will be obtained from each well and submitted for chemical analysis. Both soil and water samples will be analyzed for Volatile Organic Compounds (VOC's CLP-TCL) and TRPH (Method 418.1).

SEAD 33 (Waste Oil Tank at Building 121)

The procedures to evaluate this SWMU will be identical to those as described previously for SEAD 32. GPR will be performed to determine the boundaries of the underground storage tank. One boring will be advanced downgradient of the tank location and one will be advanced at the upgradient location (see Figure SEAD 33). The borings will be continuously sampled and screened in the field with an OVM. One soil sample from each boring, the one with the highest field screening result, the most visually stained sample or, if no oil or OVM readings are observed, the sample, the sample at the water table, will be submitted for chemical analysis. A monitoring well will be installed in each boring. One groundwater sample will be obtained from each well and submitted for chemical analysis. Both soil and water samples will be analyzed for Volatile Organic Compounds (VOC's - CLP-TCL) and TRPH (Method 418.1).

SEAD 34 Two (2) Waste Oil Tanks at Building 319

As described for both SEAD 32 and SEAD 33, GPR will be performed to determine the boundaries of the underground storage tanks. One boring will be advanced downgradient of each of the two tank locations and one will be advanced upgradient of the tank locations (see Figure SEAD 34). The borings will be continuously sampled and screened in the field with an organic vapor meter. One soil sample from each boring, the one with the highest field screening result, the most visually stained sample or, if no oil or OVM readings are observed, the sample from the water table, will be submitted for chemical analysis. A monitoring well will be installed in each boring. One groundwater sample will be obtained from each well and submitted for chemical analysis. Both soil and water samples will be analyzed for Volatile Organic Compounds (VOC's - CLP-TCL) and TRPH (Method 418.1).

SEAD 38 Boiler Plant Blowdown Pit

One boring will be advanced in the approximate center of the Building 2079 - Boiler Plant Blowdown Leach Pit (see Figure SEAD 38). The boring will be continuously sampled and field screened with an OVM. One soil sample, the split spoon soil sample that is either the most visually stained sample, or has the highest OVM field screening reading, or if no visual staining or elevated OVM headings are detected then the sample at the water table will be submitted for chemical analysis. Unlike the strategy presented for the underground storage tanks, if the highest OVM reading and the sample with the highest visual staining is observed at different locations in the boring, the location with the greatest visual staining will be sampled for chemical analysis, since volatile organics will not be sampled at the blowdown pit. The hierarchy of sampling will be: 1) visual staining, 2) highest OVM reading and 3) the water table. Four surface samples, (0-2"), will be obtained inside the perimeter of the leach pit and will be submitted for chemical analysis (see Figure SEAD 38). Chemical analyses will consist of pH (Method 9045) and TRPH (Method 418.1).

SEAD 39 Boiler Plant Blowdown Pit

Similar to SEAD 38, one boring will be advanced in the approximate center of the Building 121 - Boiler Plant Blowdown Leach Pit (see Figure SEAD 39). The boring will be continuously sampled and field screened with an OVM. Depending upon the observations during the drilling program one soil sample, either the most visually stained sample, or the sample with the highest OVM field result, or the sample from the water table, will be submitted for chemical analysis. The hierarchy of sampling will be the same as described for SEAD-38. This hierarchy sampling order is: 1) visual staining, 2) highest OVM reading and 3) the water table. Four surface samples will be obtained inside the perimeter of the leach pit and will be submitted for chemical analysis (see Figure SEAD 39). Chemical analyses will consist of pH (Method 9045) and TRPH (Method 418.1).

SEAD 40 Boiler Plant Blowdown Pit

Similar to SEAD 38 and 39, one boring will be advanced in the approximate center of the Building 319 - Boiler Plant Blowdown Leach Pit (see Figure SEAD 40). The boring will be continuously sampled and field screened with an OVM. One soil sample either the most visually stained soil, the one with the highest OVM field screening, or if no elevated OVM reading or staining is observed, the sample at the water table, will be submitted for chemical analysis. The hierarchy of sampling will be the same as described for SEAD-38. This hierarchy sampling order is: 1) visual staining, 2) highest OVM reading and 3) the water table. Four surface samples, 0-2", will be obtained inside the perimeter of the leach pit and will be chemically analyzed (see Figure SEAD 40). Chemical analysis will consist of pH (Method 9045) and TRPH (Method 418.1).

SEAD 41 Boiler Plant Blowdown Pit

In a manner similar to SEAD 38, 39 and 40, one boring will be advanced in the approximate center of the Building 718 - Boiler Plant Blowdown Leach Pit (see Figure SEAD 41). The boring will be continuously sampled and field screened with an organic vapor meter. One soil sample, the one with the highest field screening, the greatest oil staining or the sample at the water table, will be submitted

for chemical analysis. The hierarchy of sampling will be the same as described for SEAD-38. This hierarchy sampling order is: 1) visual staining, 2) highest OVM reading and 3) the water table. Four surface samples, 0-2", will be obtained inside the perimeter of the leach pit and will be chemically analyzed (see Figure SEAD 41). Chemical analysis will consist of pH (Method 9045) and TRPH (Method 418.1).

SEAD 52 Ammunition Breakdown Area Buildings 608 and 612

Bldg. 608 - Four surface soil samples, 0-2", will be collected, one from each corner of the building (see Figure SEAD 52).

Bldg. 611 - Four surface soil samples, 0-2", will be collected, one from each corner or the building (see Figure SEAD 52).

Bldg. 612 - Ten surface soil samples, 0-2", will be collected, one from each corner of the building, two from the long sides of the building, approximately 100 feet apart, and one from the middle of each of the shorter sides (see Figure SEAD 52).

All samples will be chemically analyzed for explosives (Method 8330).

SEAD 66 Pesticide Storage Area, Near Buildings 5 and 6

Eight surface soil samples, 0-2", will be collected from around the Pesticide Storage Area (see Figure SEAD 66). These soil samples will be analyzed for NYSDEC CLP pesticides.

Also attached please find a schedule indicating when these activities will take place. It is our intention that all this specified field activities will be completed between November 29, 1993 and December 17, 1993.

If you have any questions on this proposed plan or required any further information, please call.

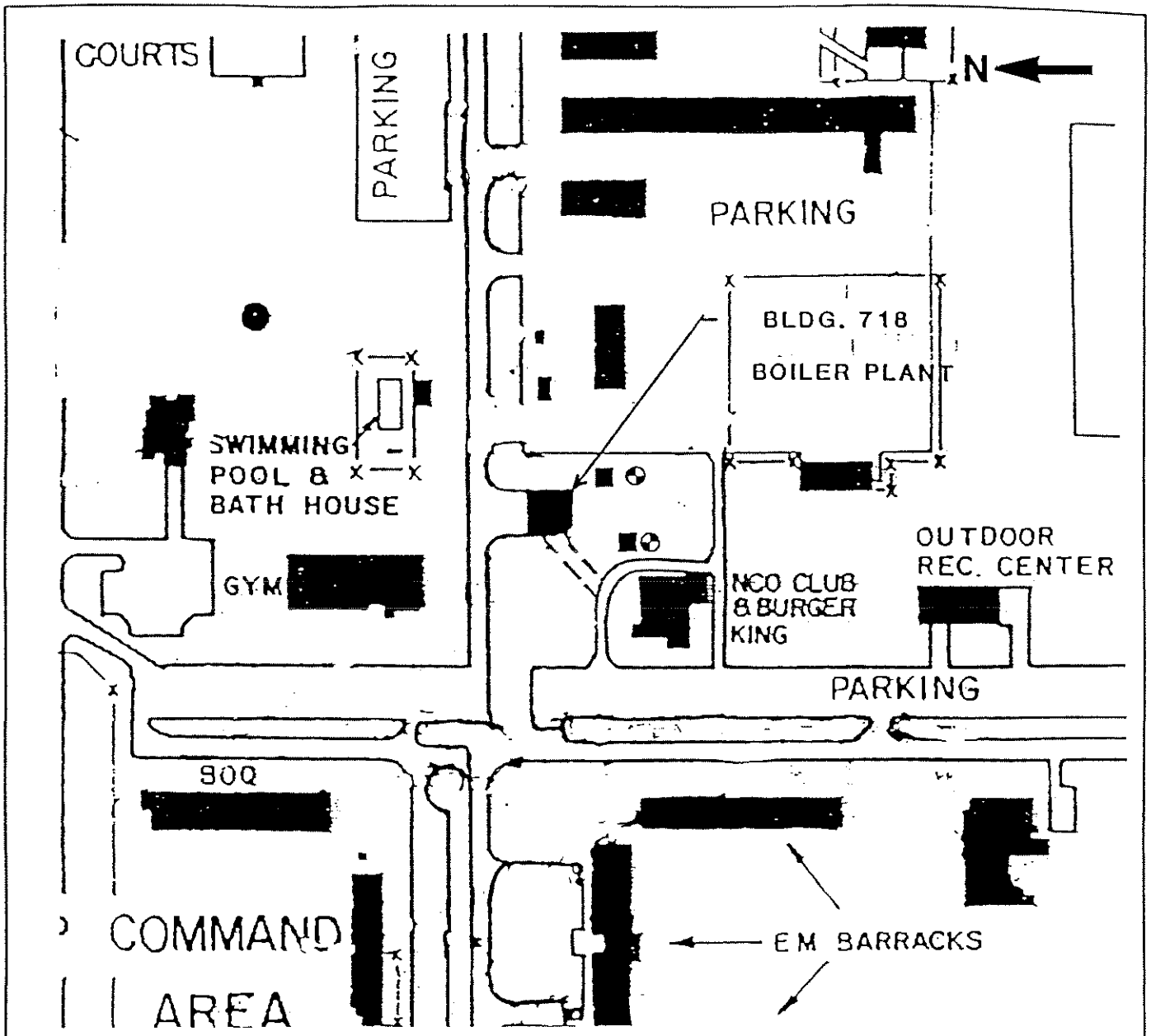
Sincerely,

ENGINEERING-SCIENCE, INC.

Michael Duchesneau, P.E.
Project Manager

MD/cmf/D#10

cc: R. Battaglia
K. Healy
C. Struble



LEGEND

- ■ SOIL BORING
- ▲ SURFACE SOIL
- ◓ MONITORING WELL

ES
ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

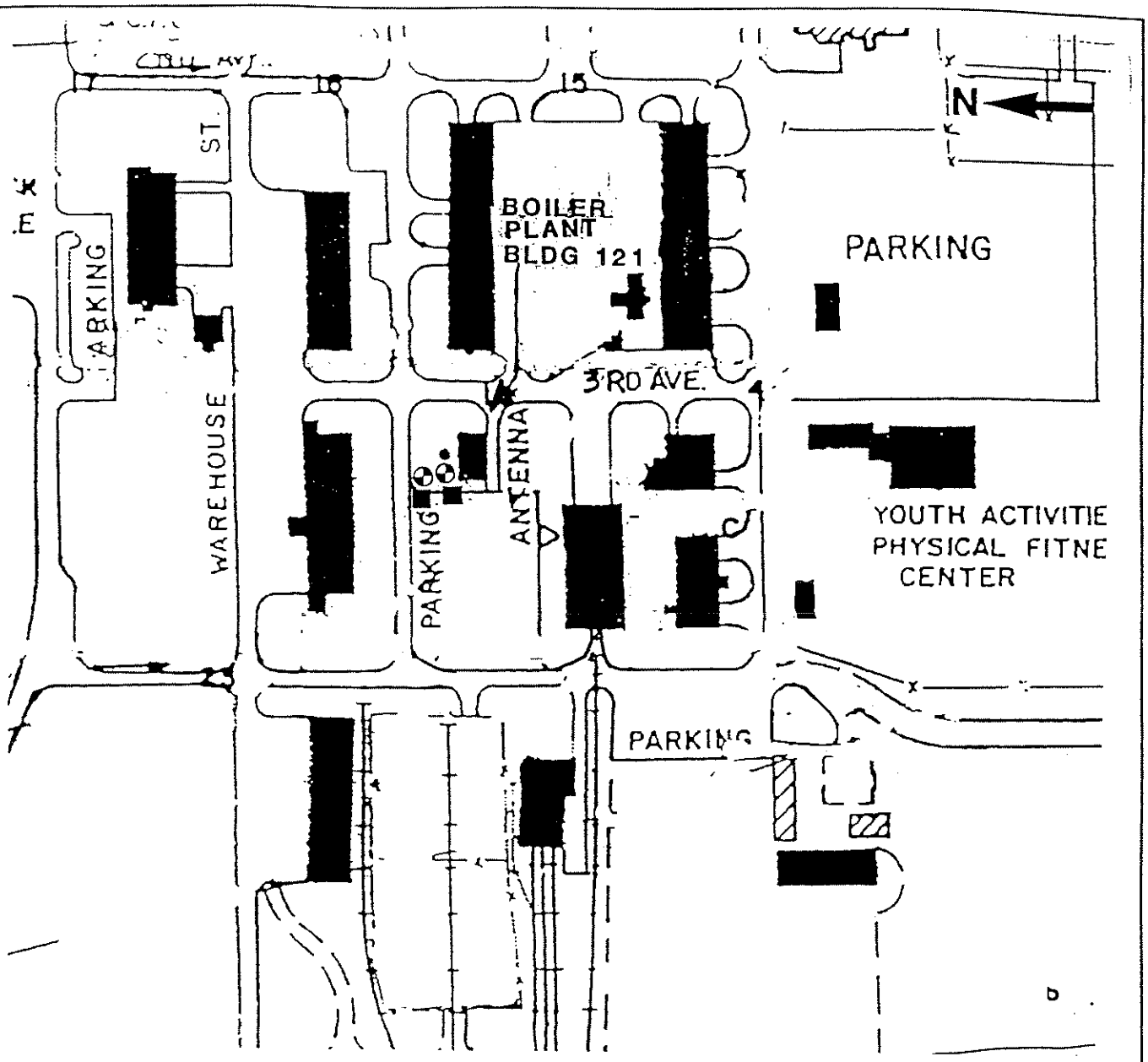
SENECA ARMY DEPOT
SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 32

SAMPLE LOCATIONS

SCALE



LEGEND

- ■ SOIL BORING
- ▲ SURFACE SOIL
- ◔ MONITORING WELL

ES

ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

SWMU CLASSIFICATION STUDY

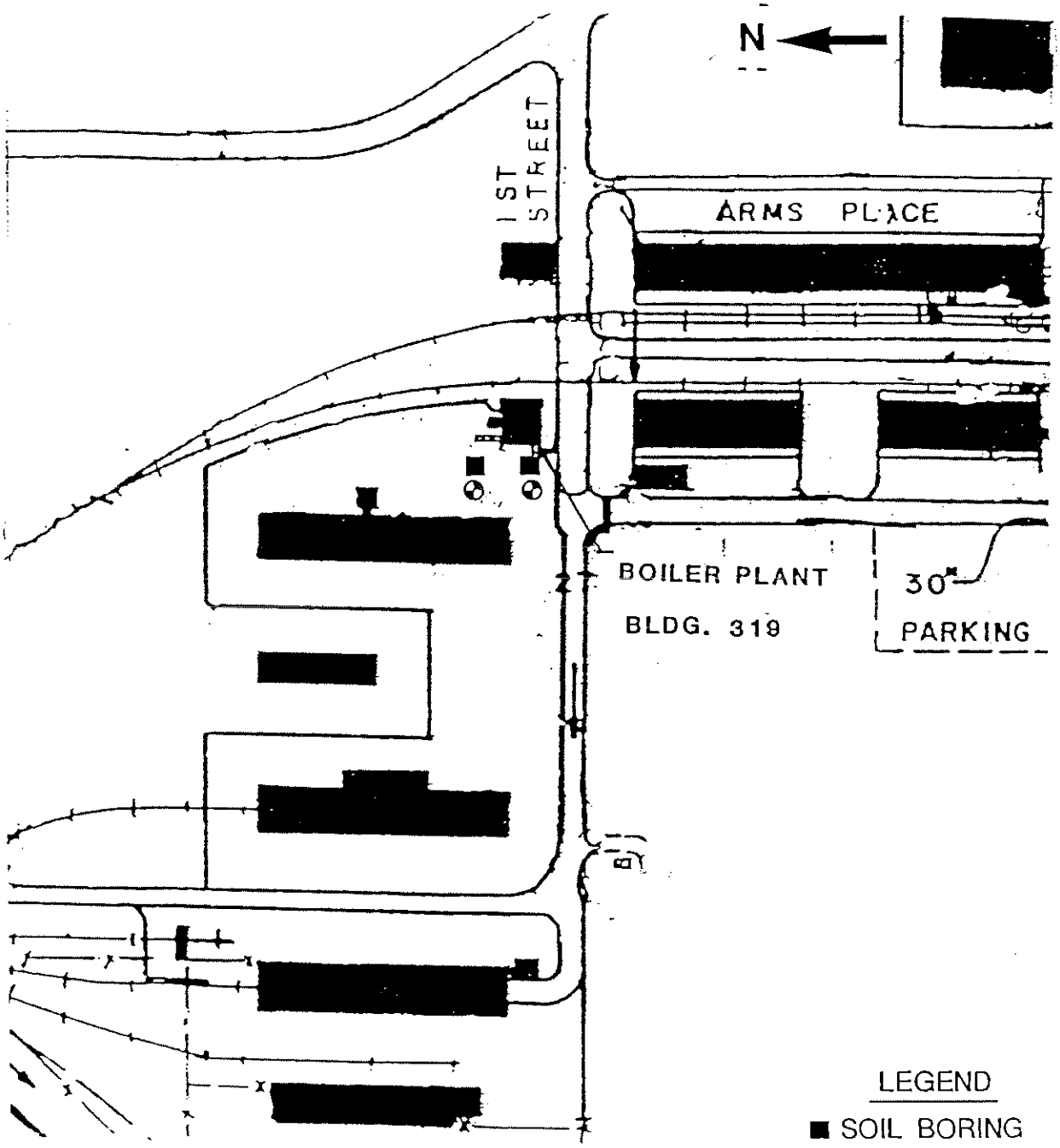
LIMITED SAMPLING

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 33

SAMPLE LOCATIONS

SCALE 1" = 200'



LEGEND

■ SOIL BORING

▲ SURFACE SOIL

◒ MONITORING WELL

ES

ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

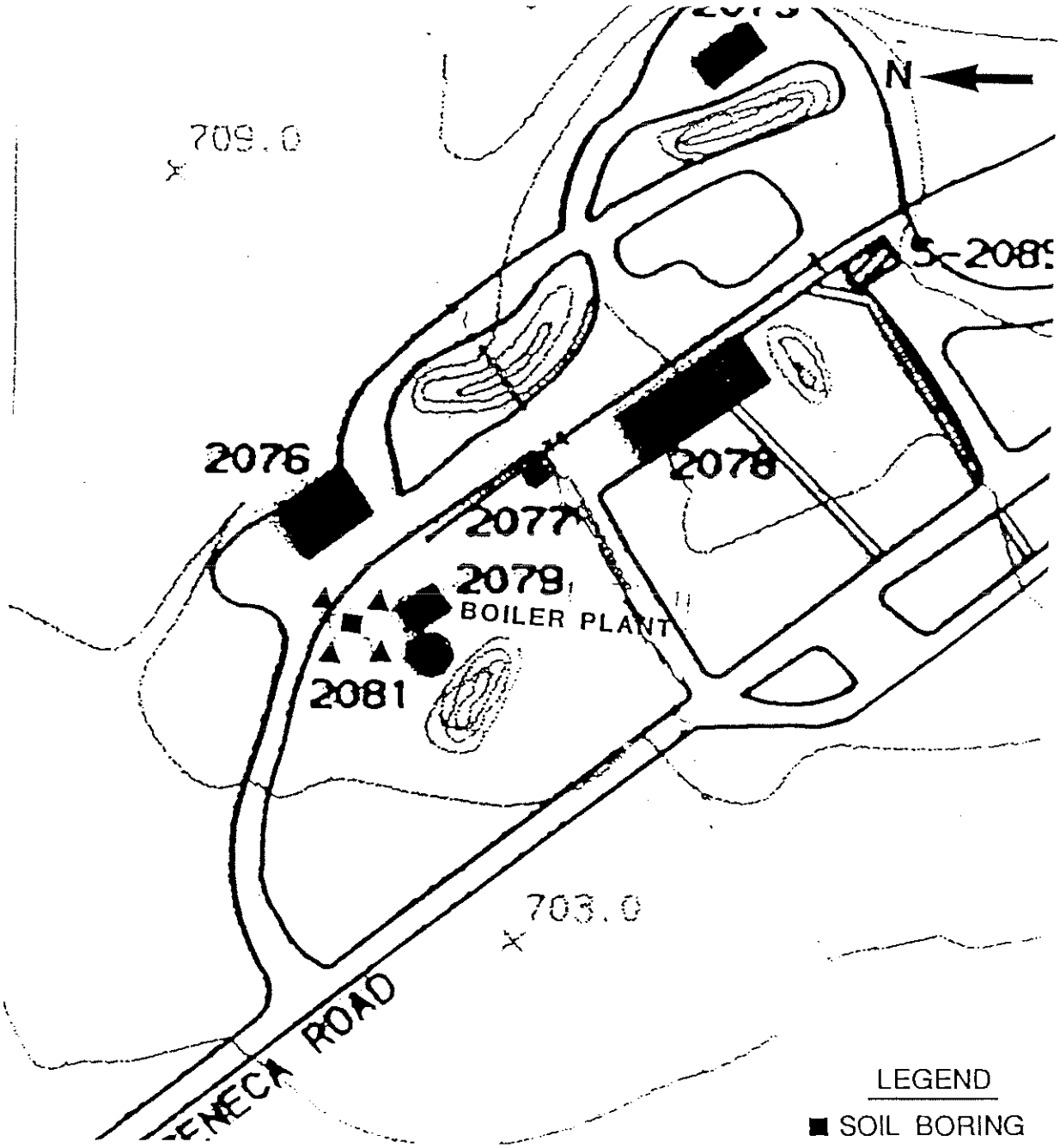
SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 34

SAMPLE LOCATIONS

SCALE 1" = 200'



LEGEND

- ■ SOIL BORING
- ▲ SURFACE SOIL
- ⊕ MONITORING WELL

ES

ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

SWMU CLASSIFICATION STUDY

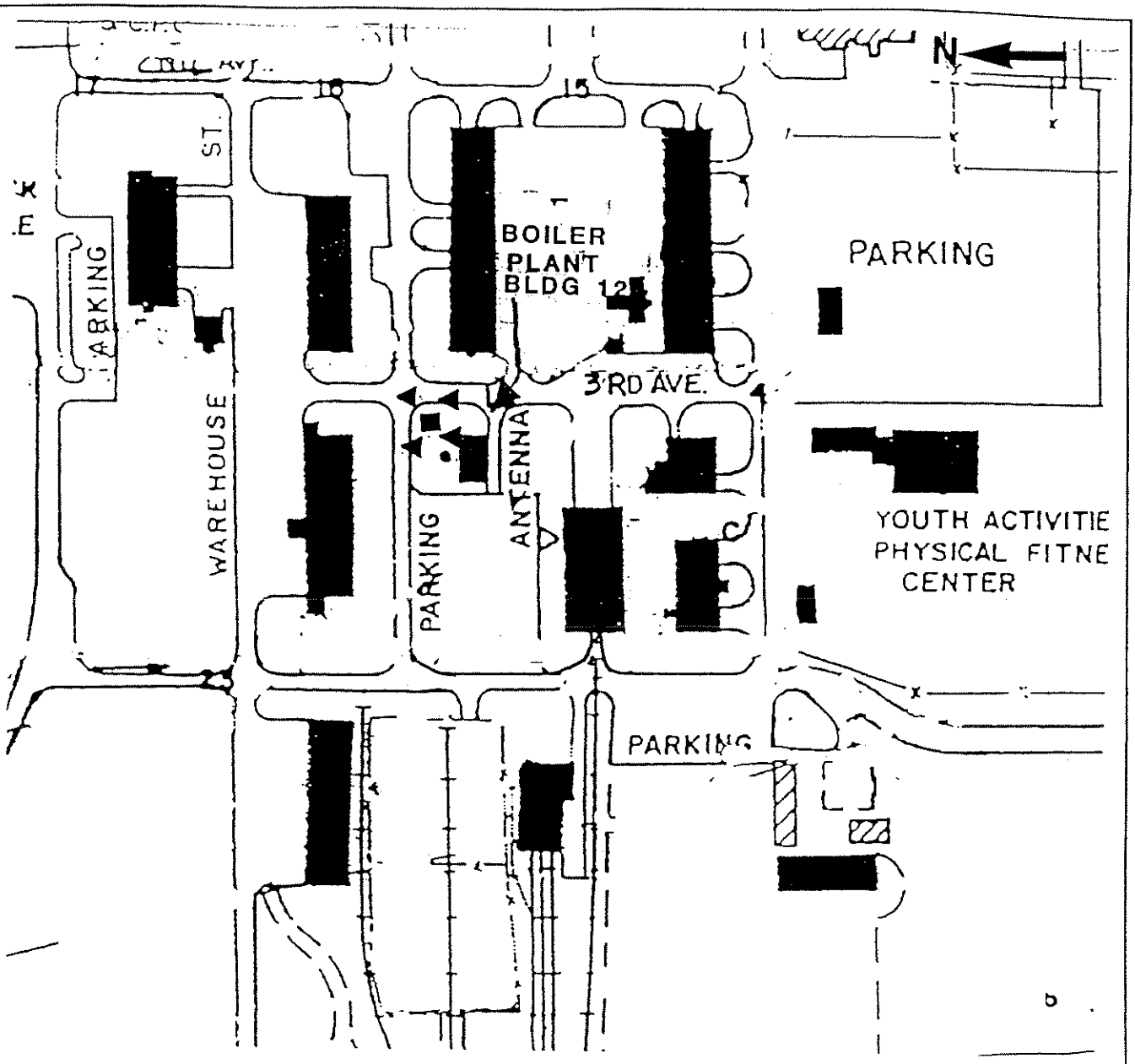
LIMITED SAMPLING

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 38

SAMPLE LOCATIONS

SCALE



LEGEND

- ■ SOIL BORING
- ▲ SURFACE SOIL
- ◔ MONITORING WELL

ES
ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

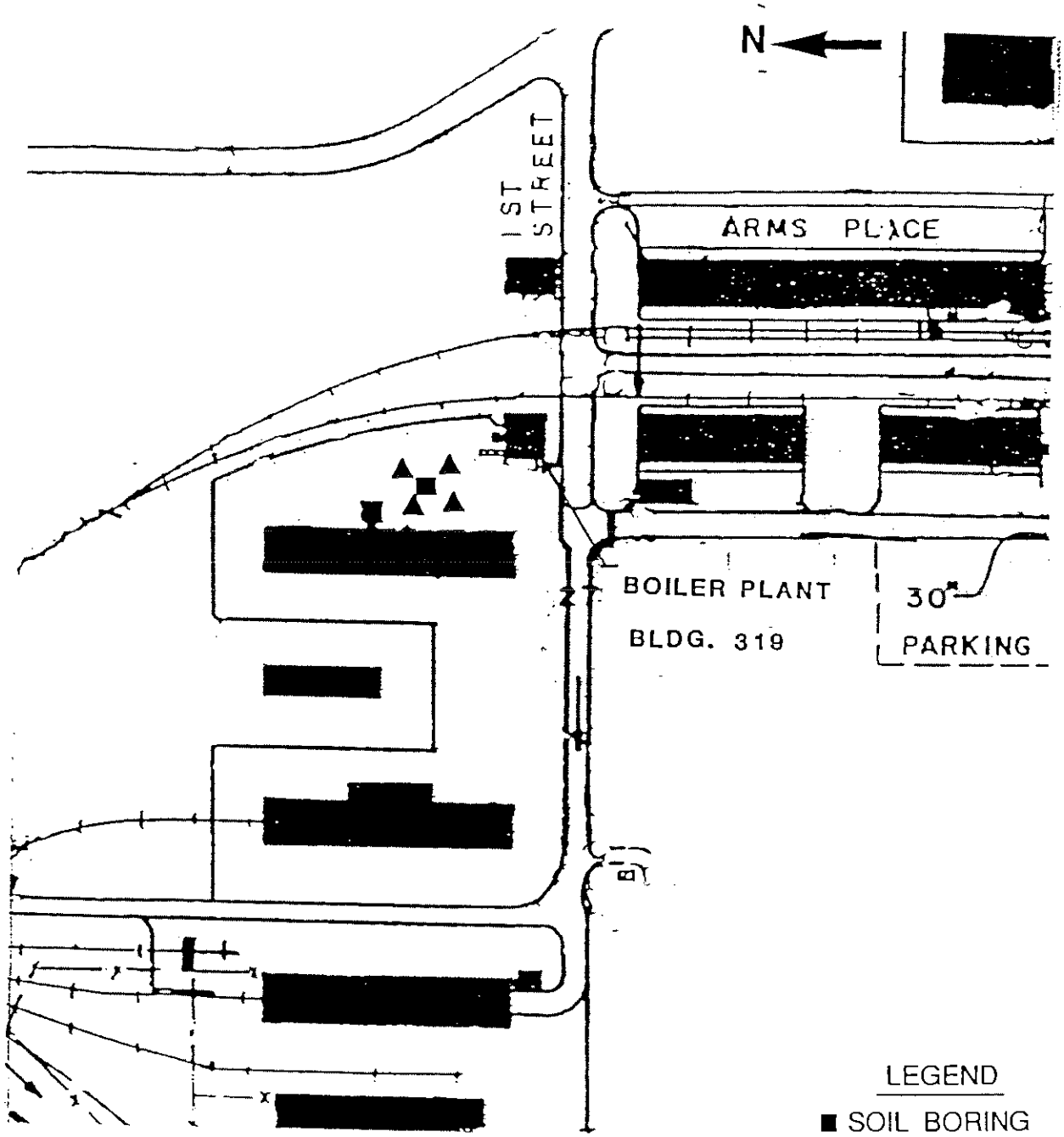
SENECA ARMY DEPOT
SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 39

SAMPLE LOCATIONS

SCALE



ES
ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

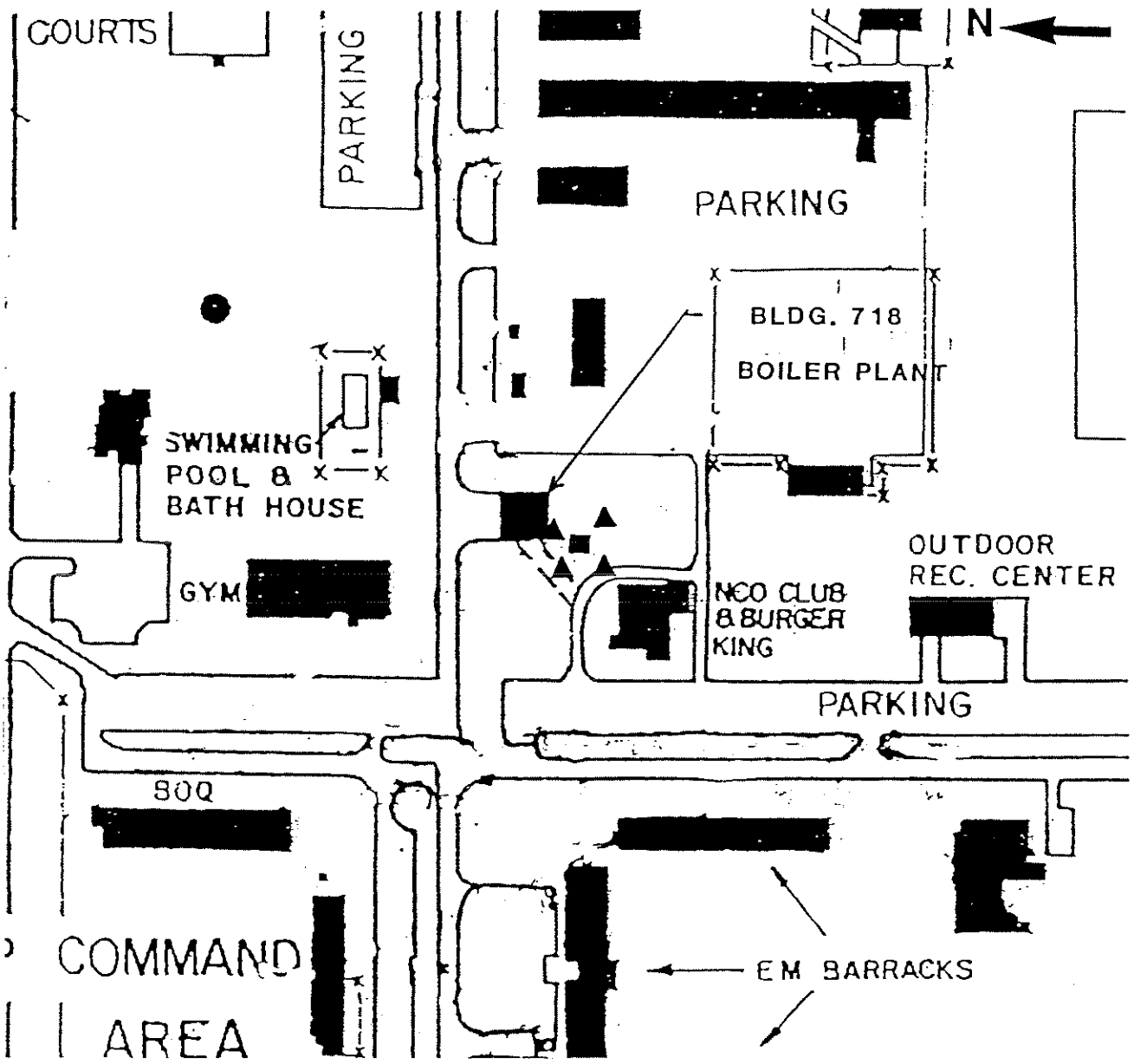
SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

DEPT ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 40

SAMPLE LOCATIONS

SCALE



LEGEND

- ■ SOIL BORING
- ▲ SURFACE SOIL
- ◔ MONITORING WELL

ES

ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

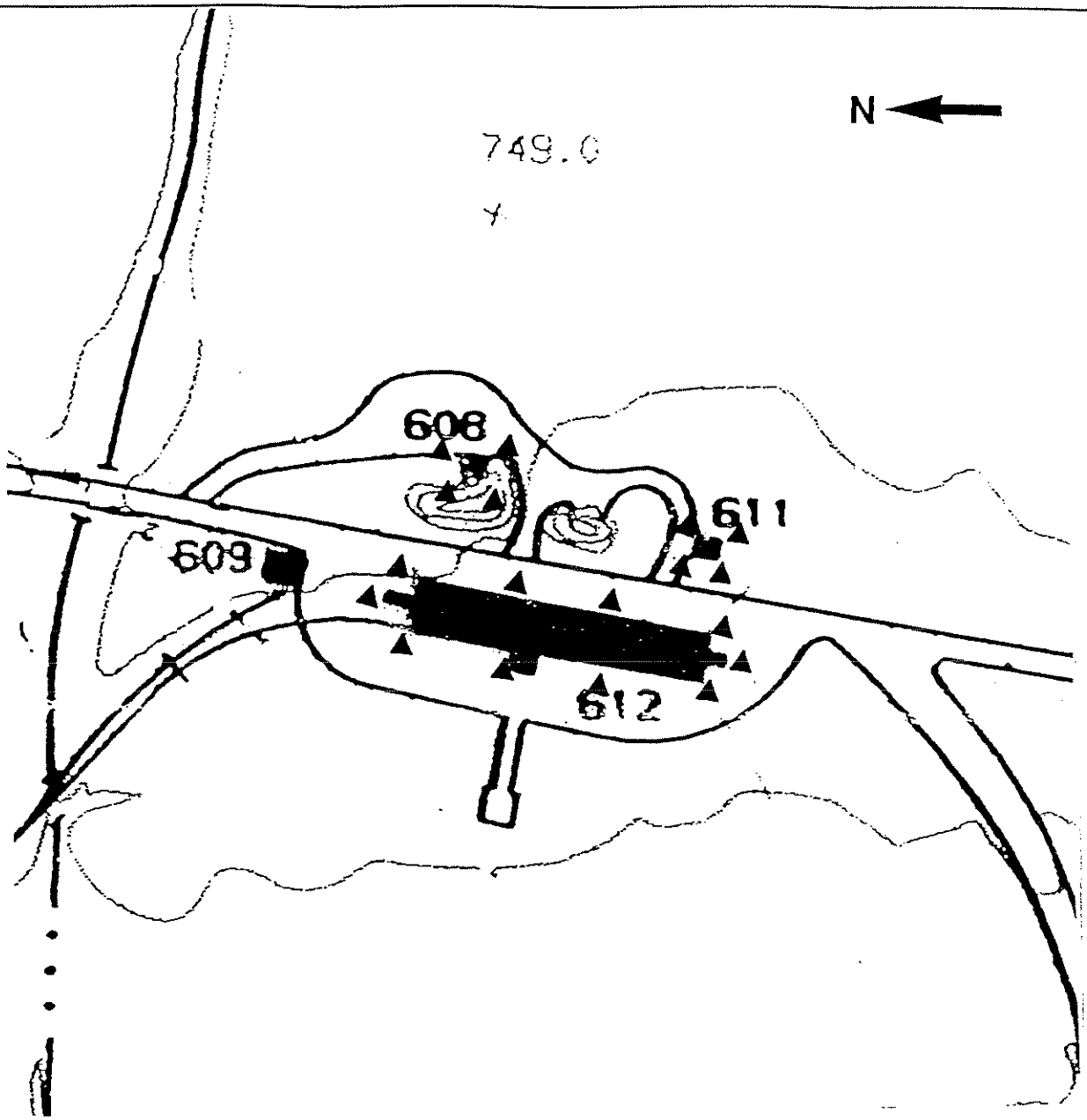
SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

DEPT.	NO.
ENVIRONMENTAL ENGINEERING	720517-01000

SEAD 41

SAMPLE LOCATIONS

SCALE



LEGEND

■ SOIL BORING

▲ SURFACE SOIL

◒ MONITORING WELL

ES

ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

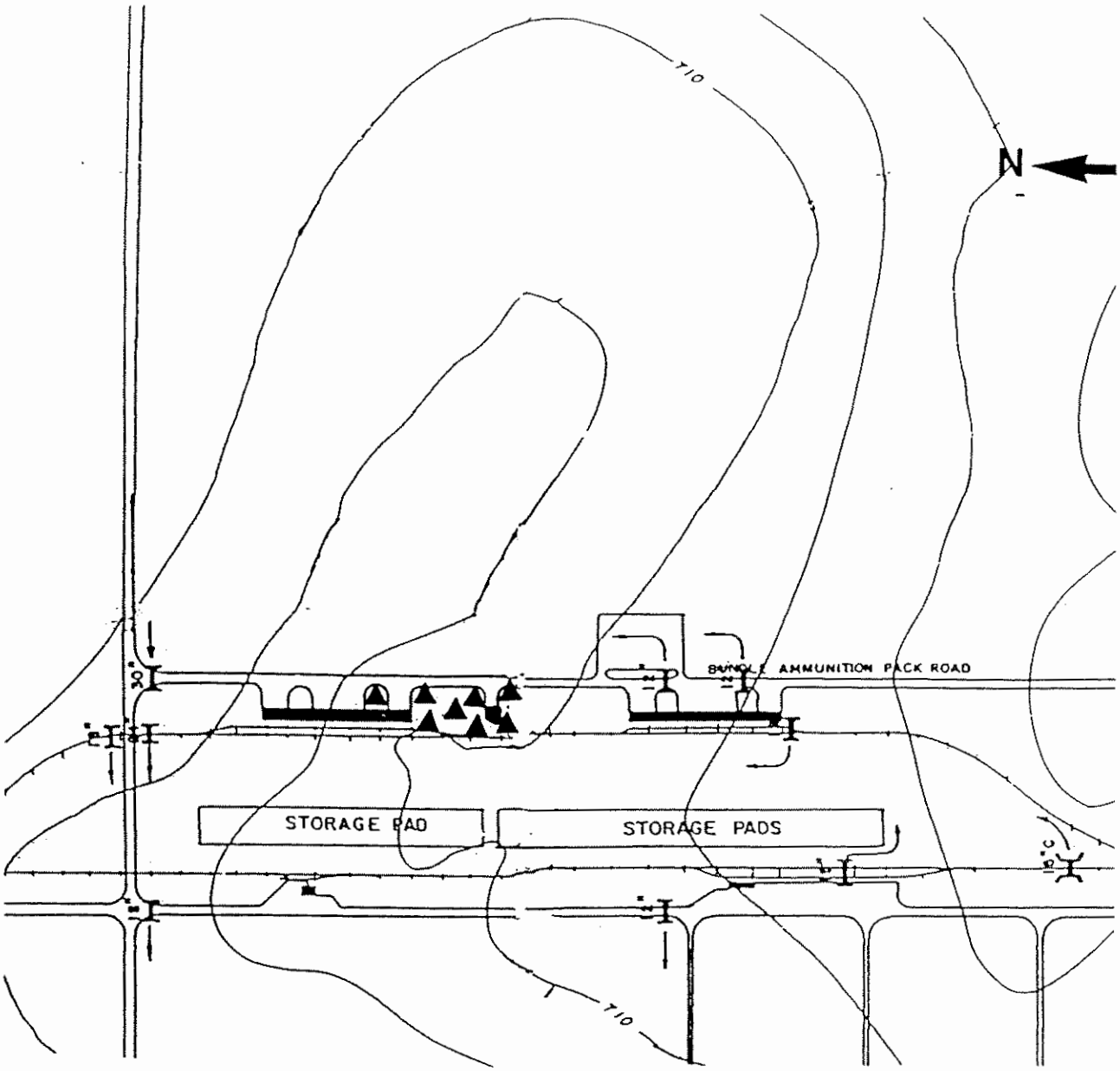
SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 52

SAMPLE LOCATIONS

SCALE 1" = 200'



LEGEND

- ■ SOIL BORING
- ▲ SURFACE SOIL
- ◓ MONITORING WELL

ES

ENGINEERING-SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT

SWMU CLASSIFICATION STUDY
LIMITED SAMPLING

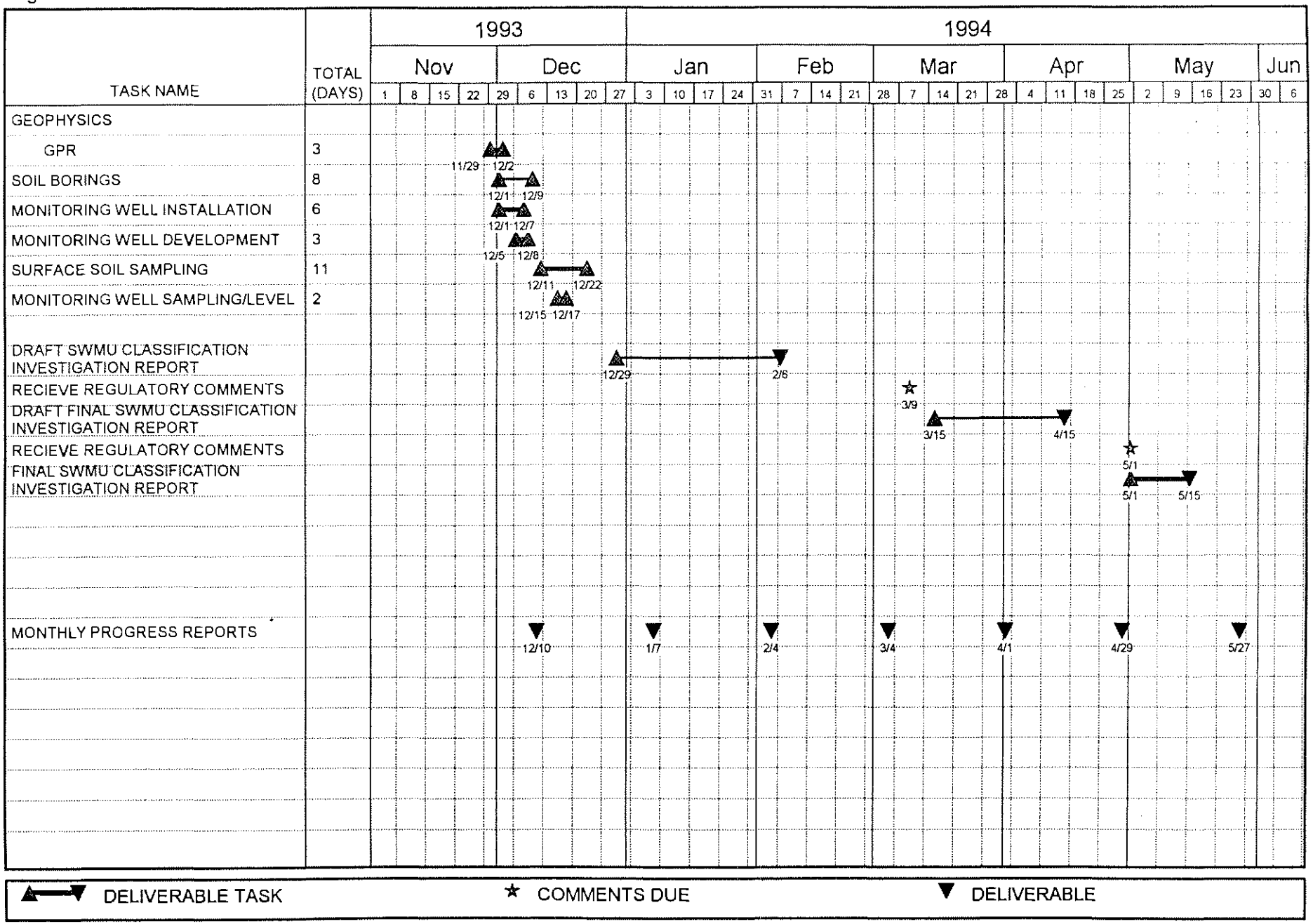
DEPT. ENVIRONMENTAL ENGINEERING | NO. 720517-01000

SEAD 66

SAMPLE LOCATIONS

SCALE 1" = 200'

SWMU CLASSIFICATION STUDY LIMITED SAMPLING



ENGINEERING-SCIENCE, INC.

Prudential Center • Boston, Massachusetts 02199 • (617) 859-2000 • Fax: (617) 859-2043

May 4, 1994
720517-01001

Mr. Kamal Gupta
Senior Engineer
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation
New York State Dept. of Environmental Conservation (NYSDEC)
Room 208
50 Wolf Road
Albany, NY 12233-7010

SUBJECT: **Limited Sampling Results for the SWMU Classification Report at Seneca Army Depot, Revision 1**

Dear Kamal:

As you requested, please find attached tables of analytical results for the limited sampling program at Seneca Army Depot. The purpose of the limited sampling program was to provide preliminary information that will be used to determine if a Solid Waste Management Unit (SWMU) is an Area of Concern (AOC) or a No Action SWMU. The following sections present a brief discussion of the relevant findings at each SWMU and a recommendation for classification of the SWMU.

SWMU 32 - Waste Oil Tanks at Building 718

Analytical results from two soil borings and two monitoring wells found no volatile organic compounds (VOCs) and low levels of Total Petroleum Hydrocarbons (TPH) (up to 0.69 mg/L in groundwater and 90 mg/Kg in soil). The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 33 - Waste Oil Tank at Building 121

Analytical results from two soil borings found no VOCs but TPH was detected at 470 mg/kg in one boring at a depth of 4 to 6 feet below grade. The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 34 - Waste Oil Tanks at Building 319

Analytical results from two soil borings and two monitoring wells found no VOCs and low levels of TPH (up to 93 mg/Kg in soil). TPH was undetected in groundwater. The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 38 - Building 2079 - Boiler Plant Blowdown Pit

Analytical results for four surface and one subsurface soil samples found TPH in two of the surface samples at concentrations up to 1940 mg/Kg. The concentration of TPH in the subsurface was low (85 mg/Kg). The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 39 - Building 121 - Boiler Plant Blowdown Pit

Analytical results for six surface and two subsurface soil samples found low levels of TPH in all samples (between 63 and 118 mg/Kg). The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 40 - Building 319 - Boiler Plant Blowdown Pit

Analytical results for four surface and one subsurface soil samples found TPH in both the surface and subsurface samples (up to 1640 mg/Kg in the surface soils and up to 1270 mg/Kg at a depth of 4 to 6 feet). The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 41 - Building 718 - Boiler Plant Blowdown Pit

Analytical results for four surface and one subsurface soil sample found a slightly elevated level of TPH in one of the surface soil samples (330 mg/Kg). The remaining samples had low levels of TPH (40 to 144 mg/Kg). The Army does not believe that these limited sampling results constitute evidence of a threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a No Action SWMU.

SWMU 52 - Bldg. 608 and 612 - Ammunition Breakdown Area

Analytical results from a total of 19 surface soil samples found traces of three explosives tetryl, 2,4,6-trinitrotoluene and 2,4-dinitrotoluene in 11 of the samples. The maximum detected concentrations were 150 μg/Kg of tetryl, 410 μg/Kg of 2,4,6-Trinitrotoluene, and 2,100 μg/Kg of 2,4-Dinitrotoluene. The Army believes that these limited sampling results may indicate a potential threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a Low Priority Area of Concern.

SWMU 66 - Pesticide Storage Area Near Bldgs. 5 and 6

Analytical results from a total of 9 surface soil samples detected the presence of pesticides or PCB's in all of the samples. The highest concentrations detected were 36,000 μg/Kg of, 4,4'-DDT and 8,700 μg/Kg of 4,4'-DDE in one of the samples. The Army believes that these limited sampling results may indicate a potential threat to health, welfare or the environment and therefore recommends that this SWMU be classified as a Low Priority Area of Concern.

After you have had time to review this data, I would like to set up a telephone conference call with you and EPA to discuss the recommended classification of each of these SWMU's. Since we are trying to finalize the SWMU Classification Report, a conference call at your earliest convenience would be preferred. Thank you for your consideration in this matter. Please call me at 617-859-2492 to confirm a time for the conference call.

Very truly yours,

ENGINEERING-SCIENCE, INC.

Michael Duchesneau, P.E.
Project Manager

MD/cmf/D#12

cc: Randall Battaglia
Kevin Healy
Carla Struble

SENECA LIMITED SAMPLING RESULTS
GROUNDWATER SAMPLES
VALIDATED VOLATILE ORGANICS ANALYSIS RESULTS

			SAMPLE DATA					QA/QC DATA		
	SDG 42207	MATRIX	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		LOCATION	SEAD-32	SEAD-32	SEAD-32	SEAD-34	SEAD-34	SEAD-32		
		DATE	02/05/94	02/05/94	02/05/94	02/06/94	02/06/94	02/05/94	02/05/94	02/06/94
		ES ID	MW32-1	MW32-2	MW32-3	MW34-1	MW34-2	MW32-1R	TB2-5-1	TB2-6
		LAB ID	210485	210487	210488	210710	210711	210486	210489	210712
CAS NO.	COMPOUND	UNITS						RINSATE	BLANK	BLANK
74-87-3	Chloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
74-83-9	Bromomethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-01-4	Vinyl Chloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-00-3	Chloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-09-2	Methylene Chloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
67-64-1	Acetone	ug/L	10 U	10 U	10 U	10 U	10 U	8 J	10 U	10 U
75-15-0	Carbon Disulfide	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-35-4	1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-34-3	1,1-Dichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
540-59-0	1,2-Dichloroethene (total)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
67-66-3	Chloroform	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
107-06-2	1,2-Dichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
78-93-3	2-Butanone	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
71-55-6	1,1,1-Trichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
56-23-5	Carbon Tetrachloride	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-27-4	Bromodichloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
78-87-5	1,2-Dichloropropane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
10061-01-5	cis-1,3-Dichloropropene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
79-01-6	Trichloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
124-48-1	Dibromochloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
79-00-5	1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
71-43-2	Benzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
10061-02-6	trans-1,3-Dichloropropene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
75-25-2	Bromoform	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
108-10-1	4-Methyl-2-Pentanone	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
591-78-6	2-Hexanone	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
127-18-4	Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
108-88-3	Toluene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
108-90-7	Chlorobenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
100-41-4	Ethylbenzene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
100-42-5	Styrene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1330-20-7	Xylene (total)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

SENECA LIMITED SAMPLING RESULTS
SUBSURFACE SOIL SAMPLES
VALIDATED VOLATILE ORGANICS ANALYSIS RESULTS

CAS NO.	COMPOUND	SDG 41316 MATRIX LOCATION DEPTH(FT.) DATE ES ID LAB ID UNITS	SOIL SEAD-32 2-4 01/10/94 SB32-1 208175	SOIL SEAD-32 2-4 01/10/94 SB32-2 208401	SOIL SEAD-33 2-4 12/16/93 SB33-1.1 207129	SOIL SEAD-33 2-4 12/16/93 SB33-1.2 207130 SB33-1.1DUP	SOIL SEAD-33 4-6 12/15/93 SB33-2.1 207098	SOIL SEAD-34 6-7 12/15/93 SB34-1.1 206930	SOIL SEAD-34 5-6 12/14/93 SB34-2.1 206931	SOIL SEAD-41 2-4 01/11/94 SB41-1 208402
74-87-3	Chloromethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
74-83-9	Bromomethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-01-4	Vinyl Chloride	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-00-3	Chloroethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-09-2	Methylene Chloride	ug/Kg	12 U	1 J	11 U	11 U	12 U	12 U	11 U	11 U
67-64-1	Acetone	ug/Kg	12 U	11 U	11 U	11 U	12 U	24 U	24 U	11 U
75-15-0	Carbon Disulfide	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-35-4	1,1-Dichloroethene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-34-3	1,1-Dichloroethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
540-59-0	1,2-Dichloroethene (total)	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
67-66-3	Chloroform	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
107-06-2	1,2-Dichloroethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
78-93-3	2-Butanone	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
71-55-6	1,1,1-Trichloroethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
56-23-5	Carbon Tetrachloride	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-27-4	Bromodichloromethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
78-87-5	1,2-Dichloropropane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
10061-01-5	cis-1,3-Dichloropropene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
79-01-6	Trichloroethene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
124-48-1	Dibromochloromethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
79-00-5	1,1,2-Trichloroethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
71-43-2	Benzene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
10061-02-6	trans-1,3-Dichloropropene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
75-25-2	Bromoform	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
108-10-1	4-Methyl-2-Pentanone	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
591-78-6	2-Hexanone	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
127-18-4	Tetrachloroethene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
108-88-3	Toluene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
108-90-7	Chlorobenzene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
100-41-4	Ethylbenzene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
100-42-5	Styrene	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U
1330-20-7	Xylene (total)	ug/Kg	12 U	11 U	11 U	11 U	12 U	12 U	11 U	11 U

SENECA LIMITED SAMPLING RESULTS
SUBSURFACE SOIL QA/QC SAMPLES
VALIDATED VOLATILE ORGANICS ANALYSIS RESULTS

	SDG 41316	MATRIX	WATER	WATER	WATER	WATER
		LOCATION	SEAD-39	SEAD-39	SEAD-40	
		DEPTH(FT.)				
		DATE	12/16/93	01/24/94	12/17/93	01/24/94
		ES ID	SB39-1.1R	SS39-1R	SS40-1R	TB124
		LAB ID	207132	209344	207140	209346
CAS NO.	COMPOUND	UNITS	RINSATE	RINSATE	RINSATE	BLANK
74-87-3	Chloromethane	ug/L	10 U	10 U	10 U	10 U
74-83-9	Bromomethane	ug/L	10 U	10 U	10 U	10 U
75-01-4	Vinyl Chloride	ug/L	10 U	10 U	10 U	10 U
75-00-3	Chloroethane	ug/L	10 U	10 U	10 U	10 U
75-09-2	Methylene Chloride	ug/L	10 U	10 U	10 U	10 U
67-64-1	Acetone	ug/L	10 U	37	10 U	32
75-15-0	Carbon Disulfide	ug/L	10 U	10 U	10 U	10 U
75-35-4	1,1-Dichloroethene	ug/L	10 U	10 U	10 U	10 U
75-34-3	1,1-Dichloroethane	ug/L	10 U	10 U	10 U	10 U
540-59-0	1,2-Dichloroethene (total)	ug/L	10 U	10 U	10 U	10 U
67-66-3	Chloroform	ug/L	10 U	10 U	10 U	10 U
107-06-2	1,2-Dichloroethane	ug/L	10 U	10 U	10 U	10 U
78-93-3	2-Butanone	ug/L	10 U	10 U	10 U	10 U
71-55-6	1,1,1-Trichloroethane	ug/L	10 U	10 U	10 U	10 U
56-23-5	Carbon Tetrachloride	ug/L	10 U	10 U	10 U	10 U
75-27-4	Bromodichloromethane	ug/L	10 U	10 U	10 U	10 U
78-87-5	1,2-Dichloropropane	ug/L	10 U	10 U	10 U	10 U
10061-01-5	cis-1,3-Dichloropropene	ug/L	10 U	10 U	10 U	10 U
79-01-6	Trichloroethene	ug/L	10 U	10 U	10 U	10 U
124-48-1	Dibromochloromethane	ug/L	10 U	10 U	10 U	10 U
79-00-5	1,1,2-Trichloroethane	ug/L	10 U	10 U	10 U	10 U
71-43-2	Benzene	ug/L	10 U	10 U	10 U	10 U
10061-02-6	trans-1,3-Dichloropropene	ug/L	10 U	10 U	10 U	10 U
75-25-2	Bromoform	ug/L	10 U	10 U	10 U	10 U
108-10-1	4-Methyl-2-Pentanone	ug/L	10 U	10 U	10 U	10 U
591-78-6	2-Hexanone	ug/L	10 U	10 U	10 U	10 U
127-18-4	Tetrachloroethene	ug/L	10 U	10 U	10 U	10 U
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	10 U	10 U	10 U	10 U
108-88-3	Toluene	ug/L	10 U	10 U	10 U	10 U
108-90-7	Chlorobenzene	ug/L	10 U	10 U	10 U	10 U
100-41-4	Ethylbenzene	ug/L	10 U	10 U	10 U	10 U
100-42-5	Styrene	ug/L	10 U	10 U	10 U	10 U
1330-20-7	Xylene (total)	ug/L	10 U	10 U	10 U	10 U

SENECA LIMITED SAMPLING RESULTS
SURFACE SOIL SAMPLES
VALIDATED PESTICIDE/PCB ORGANICS ANALYSIS RESULTS

	SDG 41315	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		SITE	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66
		DEPTH(FT.)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
		DATE	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93
		ES ID	SS66-1	SS66-9	SS66-2	SS66-3	SS66-3RE	SS66-4	SS66-5	SS66-6	SS66-7	SS66-8
		LAB ID	207164	207172	207165	207166	207166	207167	207168	207169	207170	207171
CAS NO.	COMPOUND	UNITS		SS66-1DUP								
319-84-6	alpha-BHC	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
319-85-7	beta-BHC	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
319-86-8	delta-BHC	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
58-89-9	gamma-BHC (Lindane)	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	39
76-44-8	Heptachlor	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
309-00-2	Aldrin	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
1024-57-3	Heptachlor epoxide	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
959-98-8	Endosulfan I	ug/Kg	3.2	6	4.3	2.1 U R	9.4 J	11 U	2.3 UJ	2.1 U	2 UJ	19 U
60-57-1	Dieldrin	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U
72-55-9	4,4'-DDE	ug/Kg	4.5 J	11 J	2.5 J	4.1 U R	3.1 J	110 J	4.7 J	4 U	4 J	8700
72-20-8	Endrin	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U
33213-65-9	Endosulfan II	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	22 U	3.5 J	2.5 J	4 UJ	48 J
72-54-8	4,4'-DDD	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	11 J	2.7 J	4 U	4 UJ	560 J
1031-07-8	Endosulfan sulfate	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U
50-29-3	4,4'-DDT	ug/Kg	3.5 J	10 J	4.4 U	4.1 U R	5.5 J	170	9.4 J	2 J	25 J	36000
72-43-5	Methoxychlor	ug/Kg	18 U	21 U	23 U	21 U R	21 UJ	110 U	23 UJ	21 U	20 UJ	190 U
53494-70-5	Endrin ketone	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U
7421-93-4	Endrin aldehyde	ug/Kg	3.5 U	4 U	4.4 U	4.1 U R	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U
5103-71-9	alpha-Chlordane	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	1.3 J	16 J
5103-74-2	gamma-Chlordane	ug/Kg	1.8 U	2.1 U	2.3 U	2.1 U R	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U
8001-35-2	Toxaphene	ug/Kg	180 U	210 U	230 U	210 U R	210 UJ	1100 U	230 UJ	210 U	200 UJ	1900 U
12674-11-2	Aroclor-1016	ug/Kg	35 U	40 U	44 U	41 U R	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U
11104-28-2	Aroclor-1221	ug/Kg	72 U	82 U	89 U	84 U R	84 UJ	450 U	92 UJ	82 U	81 UJ	740 U
11141-16-5	Aroclor-1232	ug/Kg	35 U	40 U	44 U	41 U R	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U
53469-21-9	Aroclor-1242	ug/Kg	35 U	40 U	44 U	41 U R	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U
12672-29-6	Aroclor-1248	ug/Kg	35 U	40 U	44 U	41 U R	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U
11097-69-1	Aroclor-1254	ug/Kg	43	80	44 U	41 U R	31 J	220 U	45 UJ	40 U	24 J	370 U
11096-82-5	Aroclor-1260	ug/Kg	35 U	40 U	44 U	41 U R	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U

SENECA LIMITED SAMPLING RESULTS
SURFACE SOIL QA/QC SAMPLES
VALIDATED PESTICIDE/PCB ORGANICS ANALYSIS RESULTS

	SDG 41316	MATRIX	WATER
		SITE	SEAD-39
		DEPTH(FT.)	
		DATE	12/16/93
		ES ID	SB39-1.1R
		LAB ID	207132
CAS NO.	COMPOUND	UNITS	RINSATE
319-84-6	alpha-BHC	ug/L	0.052 UJ
319-85-7	beta-BHC	ug/L	0.052 UJ
319-86-8	delta-BHC	ug/L	0.052 UJ
58-89-9	gamma-BHC (Lindane)	ug/L	0.052 UJ
76-44-8	Heptachlor	ug/L	0.052 UJ
309-00-2	Aldrin	ug/L	0.052 UJ
1024-57-3	Heptachlor epoxide	ug/L	0.052 UJ
959-98-8	Endosulfan I	ug/L	0.052 UJ
60-57-1	Dieldrin	ug/L	0.1 UJ
72-55-9	4,4'-DDE	ug/L	0.1 UJ
72-20-8	Endrin	ug/L	0.1 UJ
33213-65-9	Endosulfan II	ug/L	0.1 UJ
72-54-8	4,4'-DDD	ug/L	0.1 UJ
1031-07-8	Endosulfan sulfate	ug/L	0.1 UJ
50-29-3	4,4'-DDT	ug/L	0.1 UJ
72-43-5	Methoxychlor	ug/L	0.52 UJ
53494-70-5	Endrin ketone	ug/L	0.1 UJ
7421-93-4	Endrin aldehyde	ug/L	0.1 UJ
5103-71-9	alpha-Chlordane	ug/L	0.052 UJ
5103-74-2	gamma-Chlordane	ug/L	0.052 UJ
8001-35-2	Toxaphene	ug/L	5.2 UJ
12674-11-2	Aroclor-1016	ug/L	1 UJ
11104-28-2	Aroclor-1221	ug/L	2.1 UJ
11141-16-5	Aroclor-1232	ug/L	1 UJ
53469-21-9	Aroclor-1242	ug/L	1 UJ
12672-29-6	Aroclor-1248	ug/L	1 UJ
11097-69-1	Aroclor-1254	ug/L	1 UJ
11096-82-5	Aroclor-1260	ug/L	1 UJ

SENECA LIMITED SAMPLING RESULTS
SURFACE SOIL SAMPLES
VALIDATED NITROAROMATICS ANALYSIS RESULTS

SDG 41316	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	LOCATION	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52
	DEPTH (FT)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
	DATE	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93
	ES ID	SS52-1	SS52-19	SS52-2	SS52-3	SS52-4	SS52-5	SS52-6	SS52-7	SS52-8	SS52-9
	LAB ID	207145	207163	207146	207147	207148	207149	207150	207151	207152	207153
COMPOUND	UNITS		SS52-1DUP								
HMX	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
RDX	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
1,3,5-Trinitrobenzene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
1,3-Dinitrobenzene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
Tetryl	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2,4,6-Trinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
4-amino-2,6-Dinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2-amino-4,6-Dinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2,6-Dinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2,4-Dinitrotoluene	ug/Kg	110 J	120 J	130 UJ	130 UJ	130 UJ	130 UJ	280 J	130 UJ	130 UJ	490 J

SENECA LIMITED SAMPLING RESULTS
SURFACE SOIL SAMPLES
VALIDATED NITROAROMATICS ANALYSIS RESULTS

SDG 41316	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	LOCATION	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52
	DEPTH (FT)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
	DATE	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93
	ES ID	SS52-10	SS52-11	SS52-12	SS52-13	SS52-14	SS52-15	SS52-16	SS52-17	SS52-18
	LAB ID	207154	207155	207156	207157	207158	207159	207160	207161	207162
COMPOUND	UNITS									
HMX	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
RDX	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
1,3,5-Trinitrobenzene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
1,3-Dinitrobenzene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
Tetryl	ug/Kg	130 UJ	150 J	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2,4,6-Trinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	160 J	130 UJ	130 UJ	410 J	130 UJ
4-amino-2,6-Dinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2-amino-4,6-Dinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2,6-Dinitrotoluene	ug/Kg	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ
2,4-Dinitrotoluene	ug/Kg	99 J	130 UJ	91 J	200 J	1500 J	130 UJ	130 UJ	1800 J	2100 J

SENECA LIMITED SAMPLING RESULTS
SURFACE SOIL QA/QC SAMPLES
VALIDATED NITROAROMATICS ANALYSIS RESULTS

	MATRIX	WATER
SDG 41316	LOCATION	SEAD-39
	DEPTH (FT)	
	DATE	12/16/93
	ES ID	SB39-1.1R
	LAB ID	207132
COMPOUND	UNITS	RINSATE
HMX	ug/L	0.13 UJ
RDX	ug/L	0.13 UJ
1,3,5-Trinitrobenzene	ug/L	0.13 UJ
1,3-Dinitrobenzene	ug/L	0.13 UJ
Tetryl	ug/L	0.13 UJ
2,4,6-Trinitrotoluene	ug/L	0.13 UJ
4-amino-2,6-Dinitrotoluene	ug/L	0.13 UJ
2-amino-4,6-Dinitrotoluene	ug/L	0.13 UJ
2,6-Dinitrotoluene	ug/L	0.13 UJ
2,4-Dinitrotoluene	ug/L	0.13 UJ

SENECA LIMITED SAMPLING RESULTS
GROUNDWATER SAMPLES
OTHER ANALYSES

SDG 42207	MATRIX	SAMPLE DATA					QA/QC DATA
	LOCATION	WATER SEAD-32	WATER SEAD-32	WATER SEAD-32	WATER SEAD-34	WATER SEAD-34	WATER SEAD-32
	DATE	02/05/94	02/05/94	02/05/94	02/06/94	02/06/94	02/05/94
	ES ID	MW32-1	MW32-2	MW32-3	MW34-1	MW34-2	MW32-1R
	LAB ID	210485	210487	210488	210710	210711	210486
COMPOUND	UNITS						RINSATE
Total Petroleum Hydrocarbons	mg/L	0.69	0.39 U	0.53	0.39 U	0.39 U	0.4 U

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

SDG 41726	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	LOCATION	SEAD-32	SEAD-32	SEAD-33	SEAD-33	SEAD-34	SEAD-34	SEAD-38	SEAD-38	SEAD-38
	DEPTH(FT.)	2-4	2-4	2-4	4-6	6-7	5-6	0-0.2	0-0.2	0-0.2
	DATE	1/10/94	1/10/94	12/16/93	12/15/93	12/15/93	12/14/93	12/17/93	12/17/93	12/17/93
	ES ID	SB32-1	SB32-2	SB33-1.1	SB33-2.1	SB34-1.1	SB34-2.1	SS38-1	SS38-2	SS38-3
	LAB ID	208175	208401	207129	207098	206930	206931	207135	207136	207137
COMPOUND	UNITS									
Total Solids	%W/W	63.2	62	66.2	91.6	82.4	84.8	60.2	79.8	80.1
Total Petroleum Hydrocarbons	mg/Kg	90	61	78	470	81	93	1840	104	1940
pH	standard units	NS	NS	NS	NS	NS	NS	7.36	7.46	7.47

NOTE:
NS stands for NOT SAMPLED

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

SDG 41726	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	LOCATION	SEAD-38	SEAD-38	SEAD-39	SEAD-39	SEAD-39	SEAD-39	SEAD-39	SEAD-39	SEAD-39
	DEPTH(FT.)	0-0.2	2-4	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	3-5
	DATE	12/17/93	1/09/94	1/12/94	1/24/94	1/24/94	1/12/94	1/12/94	1/12/94	12/16/93
	ES ID	SS38-4	SB38-1	SS39-1	SS39-1	SS39-5	SS39-2	SS39-3	SS39-4	SB39-1.1
	LAB ID	207138	208176	208403	209343	209345	208404	208405	208406	207131
COMPOUND	UNITS					SS39-1DUP				
Total Solids	%W/W	86	88.6	83.2	82.1	82.5	79.8	84.6	83.9	85.6
Total Petroleum Hydrocarbons	mg/Kg	110	85	96	116	90	71	63	65	89
pH	standard units	7.4	8.93	7.9	7.91	8.18	8.9	8.34	8.03	7.2

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SDG 41726	LOCATION	SEAD-39	SEAD-40	SEAD-40	SEAD-40	SEAD-40	SEAD-40	SEAD-40	SEAD-41	SEAD-41
	DEPTH(FT.)	3-5	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	4-6	0-0.2	0-0.2
	DATE	12/16/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/16/93	1/11/94	1/11/94
	ES ID	SB39-1.2	SS40-1	SS40-5	SS40-2	SS40-3	SS40-4	SB40-1.1	SS41-1	SS41-2
	LAB ID	207133	207139	207144	207141	207142	207143	207134	208407	208408
COMPOUND	UNITS	SB39-1.1DUP		SS40-1DUP						
Total Solids	%W/W	84.7	90.8	91.8	89.2	81.1	69.9	85.4	88.3	86.5
Total Petroleum Hydrocarbons	mg/Kg	72	300	270	420	1640	680	1270	144	40
pH	standard units	7.39	7.86	8.15	7.64	7.54	7.29	7.37	8.74	6.57

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

SDG 41726	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	LOCATION	SEAD-41	SEAD-41	SEAD-41	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52
	DEPTH(FT.)	0-0.2	0-0.2	2-4	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
	DATE	1/11/94	1/12/94	1/11/94	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93
	ES ID	SS41-3	SS41-4	SB41-1	SS52-1	SS52-19	SS52-2	SS52-3	SS52-4	SS52-5
	LAB ID	208409	208410	208402	207145	207163	207146	207147	207148	207149
COMPOUND	UNITS					SS52-1DUP				
Total Solids	%W/W	84.4	84	85.1	77.3	78.2	65.6	69.2	66.5	74.8
Total Petroleum Hydrocarbons	mg/Kg	300	70	66	NS	NS	NS	NS	NS	NS
pH	standard units	8.49	8.19	8.64	NS	NS	NS	NS	NS	NS

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

SDG 41726	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	LOCATION	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-52
	DEPTH(FT.)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
	DATE	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93	12/16/93
	ES ID	SS52-6	SS52-7	SS52-8	SS52-9	SS52-10	SS52-11	SS52-12	SS52-13	SS52-14
	LAB ID	207150	207151	207152	207153	207154	207155	207156	207157	207158
COMPOUND	UNITS									
Total Solids	%W/W	89.8	73.8	76.2	87.3	89	92.5	88	88.1	86.8
Total Petroleum Hydrocarbons	mg/Kg	NS	NS	NS	NS	NS	NS	NS	NS	NS
pH	standard units	NS	NS	NS	NS	NS	NS	NS	NS	NS

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SDG 41726	LOCATION	SEAD-52	SEAD-52	SEAD-52	SEAD-52	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66
	DEPTH(FT.)	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
	DATE	12/16/93	12/16/93	12/16/93	12/16/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93
	ES ID	SS52-15	SS52-16	SS52-17	SS52-18	SS66-1	SS66-2	SS66-3	SS66-4	SS66-5
	LAB ID	207159	207160	207161	207162	207164	207165	207166	207167	207168
COMPOUND	UNITS									
Total Solids	%W/W	84.3	81	74.2	89.6	93	74.6	79.9	75.3	73
Total Petroleum Hydrocarbons	mg/Kg	NS	NS	NS	NS	NS	NS	NS	NS	NS
pH	standard units	NS	NS	NS	NS	NS	NS	NS	NS	NS

SENECA LIMITED SAMPLING RESULTS
SOIL SAMPLES
OTHER ANALYSES

	MATRIX	SOIL	SOIL	SOIL	SOIL
SDG 41726	LOCATION	SEAD-66	SEAD-66	SEAD-66	SEAD-66
	DEPTH(FT.)	0-0.2	0-0.2	0-0.2	0-0.2
	DATE	12/17/93	12/17/93	12/17/93	12/17/93
	ES ID	SS66-6	SS66-7	SS66-8	SS66-9
	LAB ID	207169	207170	207171	207172
COMPOUND	UNITS				
Total Solids	%W/W	82	82.6	99	82.3
Total Petroleum Hydrocarbons	mg/Kg	NS	NS	NS	NS
pH	standard units	NS	NS	NS	NS

SENECA LIMITED SAMPLING RESULTS
SOIL QA/QC SAMPLES
OTHER ANALYSES

	MATRIX	WATER	WATER	WATER
SDG 41726	LOCATION	SEAD-39	SEAD-39	SEAD-40
	DEPTH(FT.)			
	DATE	1/24/94	12/16/93	12/17/93
	ES ID	SS39-1R	SB39-1.1R	SS40-1R
	LAB ID	209344	207132	207140
COMPOUND	UNITS	RINSATE	RINSATE	RINSATE
Total Solids	%W/W	NS	NS	NS
Total Petroleum Hydrocarbons	mg/Kg	0.69	0.43 U	0.41 U
pH	standard units	6.88	6.83	7.01

APPENDIX J

APPENDIX J

Comments

CEHND Comments
SEDA Comments
AEHA Comments
SCR Resolution Meeting Minutes 9-25-92
NYSDEC Comments
USEPA Comments

CEHND Comments

ERCE

ERC Environmental and
Energy Services Co., Inc.

Environmental
Engineering Division
3325 Perimeter Hill Drive
Nashville, Tennessee 37211
Telephone: 615-333-0630
Fax: 615-781-0655

April 12, 1991

Commander
U.S. Army Corps of Engineers
Huntsville Division
Attn: CEHND-ED-PM (Mr. Kevin Healy)
106 Wynn Drive
Huntsville, Alabama 35807-4301

Re: **Draft-Final Submittal**
Solid Waste Management Unit Classification Report
Seneca Army Depot
Romulus, New York
Contract No. DACA87-88-D-0079, Delivery Order 0013, Annex "M"
ERCE Project No. D063-001

Dear Kevin:

Pursuant to the above referenced delivery order, six copies of the draft-final Solid Waste Management Unit Classification Report are enclosed. These copies are forwarded for presentation to regulatory authorities. The technical review comments and the corresponding responses from the initial draft submittal have also been enclosed (one copy).

Please do not hesitate to call me if you have any questions.

Sincerely,

ERC ENVIRONMENTAL AND ENERGY SERVICES COMPANY

E. Griff Wyatt

E. Griff Wyatt, P. E.
Senior Project Manager

EGW/jd

Enclosure

U.S. ARMY ENGINEER DIVISION HUNTSVILLE — CORPS ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT MAC-SEAD SWMU Classification Report (1-309, 11 Feb)

XX SITE DEV & GEO TECH ☐ MECHANICAL ☐ SAFETY ☐ SYSTEMS ENG
☐ ENVIR PROT & UTIL ☐ MFG TECHNOLOGY ☐ ADV TECH ☐ VALUE ENG
☐ ARCHITECTURAL ☐ ELECTRICAL ☐ ESTIMATING ☐ OTHER
☐ STRUCTURAL ☐ INSTR & CONTROLS ☐ SPECIFICATIONS

REVIEW Draft Report
DATE 18 Jan 91 TYPE
NAME Healy/ag

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1	Pg 9, Par 4.0.1	Due to initial uncertainty concerning how to approach an investigation at an open detonation grounds that was still in use (to my knowledge), the prior work performed (Obrien & Gere, Metcalf and Eddy) focused exclusively on the burning grounds. The current RI/FS is being conducted exclusively on the OB grounds. The OD area was broken out and renamed "SEAD-45" with the intention of pursuing its investigation, separately, beginning in the SWMU Classification Report. COnsequently, it is inaccurate to include "SEAD-45" in the list of AOC's presently being investigated as part of an RI/FS. The current list includes five SWMUs.	A - As discussed on 3-12-91, the open burning grounds and open detonation area will be designated as SEAD-23 and SEAD-45, respectively. From phone conversations with R. Battaglia (3-13-91), it is our understanding that Seneca has six SWMUs being investigated as part of their RI/FS activities. (SEAD-3, SEAD-6, SEAD-8, SEAD-14, SEAD-15, SEAD-23).
2	Pg 10, Par 5.0.3	See Comment 1.	A - See response 1.
3	Pg 26, Par 5.6.4.1	Please clarify. To suggest that units are low priority because no information is available could be erroneous. Is there little or no information available or does available information indicate that low priorities are warranted?	A - Para. 5.6.4.1 has been revised as discussed on 3-15-91.
4	Appendix A	Considering the number of references to the AEHA Report and the regulators lack of familiarity with it, I would suggest the report be included in the Draft-Final as "Appendix A" in place of the SOW, which is to be removed following the draft review, anyway.	A - The AEHA report has been included as Appendix D as discussed on 3-12-91.
5	Appendix B, et al	Recommend renumbering the pages of the appendices; i.e., Appendix B, page 5 would become "B-5", etc.	A - The appendices have been numbered.

ACTION CODES:
A -- ACCEPTED/CONCUR
D -- ACTION DEFERRED
W -- WITHDRAWN
N -- NON-CONCUR
VE -- VE POTENTIAL/VEP ATTACHED

U S ARMY ENGINEER DIVISION HUNTSVILLE — CORPS ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT MAC-SEAD SWMU Classification Report (1-309, 11 Feb)

XX SITE DEV & GEO TECH ( ) MECHANICAL ( ) SAFETY ( ) SYSTEMS ENG
( ) ENVIR PROT & CIVIL ( ) MFG TECHNOLOGY ( ) ADV TECH ( ) VALUE ENG
( ) ARCHITECTURAL ( ) ELECTRICAL ( ) ESTIMATING ( ) OTHER
( ) STRUCTURAL ( ) INSTR & CONTROLS ( ) SPECIFICATIONS

REVIEW Draft Report
DATE 18 Jan 91 TYPE
NAME Healy/ag

ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
6	Appendix B, Page 5	With reference to Comment 1, above, differentiate between SEAD-23 and SEAD-45. Change "90 acres" to "30 acres" in Item 13 and in Item 14, change "same as SEAD-23" to "adjacent to SEAD-23".	A - This section has been revised accordingly.
7	Appendix D, Section 23	Again, differentiate between SEAD's 23 and 45 by removing the descriptions of and references to SEAD-45.	A - This section has been revised accordingly.
8	Appendix D, Section 45	Differentiate between the two SWMUs by removing the descriptions and references to SEAD-23. In paragraph 4.5.7, include sampling recommendations as in the other SWMU's requiring additional investigation.	A - This section has been revised accordingly.
9	Appendix D, Par 49.3	Correct "thronim-232".	A - This error has been corrected.

ACTION CODES:
A -- ACCEPTED/CONCUR
D -- ACTION DEFERRED
W -- WITHDRAWN
N -- NON-CONCUR
VE -- VE POTENTIAL/VEP ATTACHED

U S ARMY ENGINEER DIVISION HUNTSVILLE

CORPS of Engineers

DESIGN REVIEW COMMENTS

PROJECT: AMC SEAD SWMU CLASSIFICATION STUDY NT-309

REVIEW: DRAFT

DATE: 25 JAN 1991

NAME: JIM FERRIS 205-955-5785

[ ] SITE DEV & GEOTECH	[ ] MECHANICAL	[ ] LEGAL ITS	[ ] SYSTEMS ENG
[ ] ENVIR PROT & UTIL	[ ] MFG TECHNOLOGY	[X] ADV TECH	[ ] VALUE ENG
[ ] ARCHITECTURAL	[ ] ELECTRICAL	[ ] ESTIMATING	[ ] OTHER
[ ] STRUCTURAL	[ ] INSTR & CONTROLS	[ ] SPECIFICATIONS	

ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
1.		List of acronyms and abbreviations. USCOE should read USACE.	A - USCOE has been changed to USACE.
2.		Field Report of the site visit conducted 10-14 Sep 90: The team did not contain an EOD or UXO person. It should have particularly since SWMUs to be visited included areas where UXO could be encountered.	
3.	SEAD-8	Since explosive compounds were detected by PT-11, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	W -No sampling has been recommended for SEAD-8 as discussed with R. Battaglia on 3-13-91.
4.	SEAD-11	Since this unit's contents are unknown, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	A - This section has been revised accordingly.
5.	SEAD-23	The procedures outlined in paragraph 23.2.4.1 do not indicate if the operator ever uncovered the detonation site to ensure complete detonation of all materials. Any intrusive work on this site, monitoring wells and/or trenches should be supervised for UXO personnel.	W - No sampling has been recommended for this unit.
6.	SEAD-44	Any intrusive work, such as recommended soil samples, should be supervised by UXO personnel.	A - This section has been revised accordingly.
7.	SEAD-46	Any intrusive work, such as recommended soil samples, should be supervised by UXO personnel.	A - This section has been revised accordingly.
8.	SEAD-57	Any intrusive work, such as recommended soil samples, should be supervised by UXO personnel. No entry onto	A - This section has been revised accordingly.

ACTION CODES:
A ACCEPTED/CONCUR
D ACTION DEFERRED
W WITHDRAWN
N NON CONCUR
VE POTENTIAL/VEP ATTACHED

U.S. ARMY ENGINEER DIVISION HUNTSVILLE

CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT: AMC SEAD SWMU CLASSIFICATION STUDY #1-109

( ) SITE DEVELOPMENT (X) MECHANICAL (X) SAFETY ( ) SYSTEMS ENG
( ) ENGR PHOT & CIV (X) MFG TECHNOLOGY (X) ADV TECH ( ) VALUE ENG
( ) ARCHITECTURAL ( ) ELECTRICAL ( ) ESTIMATING ( ) OTHER
( ) STRUCTURAL (X) INSTR & CONTROLS ( ) SPECIFICATIONS

REVIEW: DRAFT

DATE: 25 JAN 1991

NAME: JIM FERRIS 205-955-5785

ITEM	DRAWING NO OR REFERENCE	COMMENT	ACTION
8.	(Cont'd)	this site should be allowed unless escorted by EOD or UXO personnel.	
9.	SEAD-59	Since this unit's contents are unknown, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	A - This section has been revised accordingly.
10.	SEAD-62	Since this unit's contents are unknown, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	W - No sampling has been recommended for this unit.
11.	SEAD-63	Since this unit's contents are unknown, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	A - This section has been revised accordingly.
12.	SEAD-67	Since this unit's contents are unknown, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	A - This section has been revised accordingly.
13.	SEAD-69	Since this unit's contents are unknown, any intrusive work, such as recommended test pits, should be supervised by UXO personnel.	A - This section has been revised accordingly.

ACTION CODES:
A ACCEPTED/CONCUR
D ACTION DEFERRED
W WITHDRAWN
N NON CONCUR
VE POTENTIAL/VEP ATTACHED

SEDA Comments

SENECA ARMY DEPOT COMMENTS ON THE DRAFT SOLID WASTE MANAGEMENT UNIT CLASSIFICATION STUDY

January 29, 1991

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
PA	SECTION	PARA.		
NA	PHOTOLOG	PHOTO # 101	The description for this photo should be changed to reflect the fact that only two of the boilers burned waste oil. One of the boilers burned only coal.	A - The description for this photograph has been revised.
0	1.2.1	1	References such as: "...the IAG has not been finalized... ", should be replaced with a sentence such as: " As of the date of this document, the IAG has not been finalized".	A - Sec. 1.2.1 has been revised accordingly.
1	1.2.2	1	This sentence needs to be revised to reflect the fact that the OB/OD grounds are under final status.	W - As discussed with R. Battaglia on 4/4/91.
2	1.2.3	1	This section recites language from the Resource Conservation and Recovery Act (RCRA), but gives reference to the IAG (via a footnote). Although the IAG also cites the same provisions of RCRA (see the IAG para 7.5), it would seem more appropriate to cite the primary source of law (RCRA) when reciting the exact statutory language.	A - Sec. 1.2.3 has been revised accordingly.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
2	1.2.4	1	The IAG is referenced in the second sentence by use of a footnote. For this to be correct; the second sentence should read something to the effect of ".....The IAG also states that the identification process in to comply with the requirements set fourth in the RCRA Facility Assessment (RFA) guidance [4]..."	A - Sec. 1.2.4 has been revised accordingly.
3	2.2.3	1	The two studies referred to in the first sentence of this paragraph should be referenced by their corresponding footnotes.	A - Sec. 2.2.3 has been revised accordingly.
3	2.2.3	1	1. Typo : The second sentence should read "...Contaminants suspected of release include heavy metals, explosives, and radioactive materials. " 2. Typo : the word "...also..." in the first sentence can be deleted. 3. The second sentence should be revised to include spent organic solvents. 4. The last sentence in this paragraph needs to explicitly state which areas have been targeted for further study. 5. Typos : Environmental and Contaminants are misspelled.	A - Sec. 2.2.3 has been revised accordingly.
4	Figure 2.1		The town of Waterloo boundary is missing from figure 2-1; adjust accordingly.	A - Figure 2-1 has been revised accordingly.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
5	2.2.3	1	This paragraph incorrectly implies that RI/FS's work plans have already been developed. To date, work plans exist in the draft final stage for the Ash Landfill and in the draft stage for the OB/ OD grounds. No RI/FS work plans have been finalized.	A - Sec. 2.2.3 has been revised accordingly.
6	3.1.1	1	The last sentence of this paragraph incorrectly states that the depth to bedrock is 12 to 25 feet.This data needs to be validated.	A - Sec. 3.1.1 has been revised to include the information provided by R. Battaglia on 3-15-91.
7	3.4	1	An average snow fall of 100 inches seems to high, this number should be confirmed and checked.	A - This sentence has been deleted as discussed with R. Battaglia on 3-12-91.
9	4.0.1	1	The last sentence in this paragraph should read : RI\FS activities have been initiated for these six solid waste management units.	A - Sec. 4.0.1 has been revised accordingly.
0	FIGURE 5.1	NA	This Figure should indicate its name, i.e. FIGURE 5.1	A - The fig. name has been added.
0	Figure 5.1	NA	This SWMU locations map should "block off " the area north of the burn pits at the ash landfill (SEAD 14) to Cemetery road to the Kendaia Cemetery to approximately the 650 msl contour. This is a general area which contains several piles of debris. i.e.	A - This area has been added to Figure 5-1 and included with the SWMU description for SEAD-6 as discussed with R. Battaglia on 3-12-91.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
0	FIGURE 5-1	na	SEAD-13 is indicated by one block only. This area can be more correctly represented by two blocks along the south side of east- west base line road. One of these blocks should be located on the east side of the pond, and one should be located on the west side of the pond.	A - Figure 5-1 has been revised accordingly.
20	5.2.1	1	1. There are Eight, not Seven SWMU's listed in table 5-4. 2. Typo : A semi-colon is inappropriately used in the second sentence.	A - Sec. 5.2.1 has been revised accordingly.
21	5.2.2	1	The first sentence inappropriately states that"..... test pits will be dug within...." . This needs to be changed since this is only a recommendation that test pits be dug.	A - Sec. 5.2.2 has been revised accordingly.
3	2.2.3	1	Typo : past practices	A - This error has been corrected.
25	TABLE 5-8	ROW 6	Because the exact delineation of the Nicotine Sulfate Disposal area is not precisely known, this row should more correctly read :" Nicotine Sulfate Disposal Area near buildings 606 or 612".	A - Table 5-8 has been revised accordingly.
20	5.1.1.2	1	Typo : Classification yards	A - Classified yards has been replaced with classification yards.
22	5.3.1	1	Building 606 is not a waste handling facility. Hazardous materials from the old missile test facility were possibly spilled at this location.	A - The reference to SEAD-56 in Sec. 5.3.1 has been deleted.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
25	TABLE 5-7	row 8	The oil discharge area adjacent to Bldg. 609 more than likely received only fuel or lubricant oil used in boiler operation. In light of this fact, perhaps this area does not warrant listing as a high priority unit.	A - The oil discharge area adjacent to Bldg. 609 has been listed as a moderate priority unit.
25	TABLE 5-8	row 3	The IFRNA disposal site perhaps does not warrant listing as a high to moderate priority unit since it contains substances that are not considered hazardous. The IFRNA site contains only nitrates, nitrites, and fluoride, none of which are listed hazardous substances.	W - The IRFNA disposal site has been listed as a moderate priority unit. Nitrate, nitrites, and flourides are pollutants and MCLS have been established for these parameters.
3	APPEND B	B. 1	The discussion of SEAD should include a description of why the wood pile was smoking. This could be achieved by referencing App. D, SWMU 10, were it describes the operating practice of fire training	A - Section B.1 has been revised accordingly.
8	APPEND B	#12- bullet 3	This section should state the following :" The tanks at the tank farm were held over a period of 15-20 years."	A - This section has been revised accordingly.
10	APPEND B	#6- bullet 1	The following distinction needs to be made: The permitted capacity is 300,000 gallons per day. The Design Capacity of this tank is 750,000 gallons per day.	A - This statement has been revised accordingly.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
10	APPEND B	#1- bullet 1	It should be specified in this sentence that demolition debris does not include construction debris such as plywood, boards, roofing material , siding, etc. This can be accomplished by referencing Appendix D, SWMU -7 ,which more accurately defines the nature of the construction debris located at this unit.	A - This sentence has been revised accordingly
4	APPEND C	D	The following changes are required: 1. Delete the following text "...,personnel with DLA (Defense Logistics Agency,formerly called GSA ". 2. Revise paragraph to reflect the fact that Dennis Wells is chief of Seneca Army Depots General Supply Division, which is a part of the Seneca Army Depot's directory of Supply Explanation: The Defense Logistics Agency (DLA) is a distinct and separate subdivision of the Department of Defense (DOD). The General Services Administration (GSA), is not a subdivision of the DOD. The GSA still exists as a separate organization. The DLA assumed accountability and control of the ore storage from the GSA.	A - Section D has been revised accordingly.
6	APPEND C	#1- Bullet 1	Note the following and make required changes: Ft. Durham should be Ft. Drum. Classified yards should be classification yards.	A - This section has been revised accordingly.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
NA	APPEND D, SEAD -3, sec 3.7	1	This paragraph should reflect the fact that all the SWMU's at the Ash Landfill Area (SEAD- 3, SEAD-6, SEAD- 14, SEAD- 15)are being treated an one operable unit for RI\FS purposes.	A- This para has been revised accordingly. SEAD-8 was added to the operable unit per conversation with R. Battaglia on 3-13-91.
NA	APPEND D, SEAD -4, sec 4.2.4	1	This paragraph should read "... dissolved explosives such as TNT, RDX.." This paragraph should also reflect the fact that these are the most probable contaminates, and that the actual explosives in the waste water are unknown. In addition, this paragraph should also mention the fact that the waste water was reportedly processed through sawdust to remove any solid explosive residues prior to any discharge.	A - This paragraph has been revised accordingly.
NA	APPEND D SEAD 5,sec 5.3.3	1	This paragraph should state that Copper and nitrates are non-hazardous materials.	A - This paragraph has been revised accordingly
NA	APPEND D SEAD-6,sec 6.2.4	1	This paragraph uses the term "Varick dump". A more formal wording such as the "...The Town of Varick public sanitary landfill... " should be used in place of the term " dump".	A -This paragraph has been revised accordingly

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
NA	APPEND D SEAD-8,sec 8.3.2	1	There exists two points of concern regarding this paragraph that need to be addressed or mentioned. 1. A short discussion regarding quality assurance/quality control is necessary.The discussion should point out that the accuracy of a value near the detection limit for the given test decreases. When a value is near the detection limit for the test , it is possible that the value may show a positive result due to inaccuracies inherit in the analysis. Hence, the only reported value above the detection limit(the 1.5 ug/l 1,1-Dichloroethene) is not necessarily indicative of groundwater contamination. 2. Section 8.7 states that continued monitoring and verification is required, however more wells may or may not be needed.	A - Sec. 8.3.2 has been revised to reflect comment 1. W - Section 8.3.2 has been revised to reflect that SEAD-8 is part of the operable unit for the ash landfill as discussed with R. Battaglia on 3-13-91.
NA	APPENX D SEAD- 10, sec 10.2.4	1	The pallet and pressure treated lumber <u>sales area</u> is incorrectly refereed to as a <u>disposal area</u>.	A - This statement has been revised accordingly
NA	APPENDX D SEAD-17,sec 17.2.4	1	Last sentence needs revision to reflect the following : "....scrap metal is disposed of in barrels ...."	A -This statement has been revised accordingly
NA	APPEND D SEAD -17, sec 17.2.5	1	TYPO; NYSDES Should be NYSDEC(NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION)	A - This statement has been corrected.
NA	APPEND D SEAD-17, sec 17.2.1	1	The second line in this paragraph should read opacity not capacity	A - This statement has been corrected.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
NA	APPEND D SEAD 18,	all	Section 18.0 needs revision to reflect the following building/incineration histories: Building 709- A classified document incinerator was operational in location A (see the enclosed map) from approximately 1956 until 1983. In 1983, building 709 was torn down, and a new building was constructed in a adjacent location. This new building,also named building 709, is a state of the art incinerator. The location of the modern incinerator is shown on the enclosed map (location B).	A - This section has been revised accordingly.
NA	APPEND D SEAD-18, sec 18.3.1	1	Should read " .....(not since regulated by New York State)..."rather than "....(not within recent past)...."	A - This statement has been revised accordingly.
NA	APPEND D SEAD-19,	all	This section needs revision to reflect the following building/incineration history : Building 801- A classified document incinerator was replaced in 1983 with the modern / upgraded incinerator which is currently operational. The old incinerator was operational between approximately 1956 and 1983. The location of building 801 has never changed.	A - This section has been revised accordingly.
NA	APPEND D SEAD, sec 19.3.1	1	This sentence needs revision that reflects the fact that infectious waste was never incinerated at Bldg. 801 at any time.	A - This sentence has been revised accordingly.
NA	APPEND D SEAD-21, sec 21.2.4.2	1	This paragraph needs to be updated as follows: 1. The combustible beds were on pad " J". 2. Propellent burns were 200 ft. long on pad "H".	A - This section has been revised as discussed with R. Battaglia on 3-12-91.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
NA	APPEND D SEAD 23,sec 23.2.5	1	Line five should read ".....with a burning tray" rather than "....with burning trays " This fact is shown by photo # 68.	A - This statement has been revised accordingly.
NA	FIGURE D-23	NA	This figure should show all wells, see the attached map	A - The wells shown in the figure provided to ERCE on 3-15-91 have been included on Fig. D-23.
NA	APPEND D SEAD-27	PHOTOS	1. Photo 81 is actually facing north 2. Photo 82 is actually facing west 3. Photo 83 is actually facing West	A - The photograph descriptions have been revised accordingly.
NA	APPEND D SEAD-32	ALL	All Paragraphs in this section should be revised to show the following : 1. From 1956 to present the primary use of all tanks was for storage of fuel. The primary fuel type stored in these tanks is # 6 fuel. It should be stated that # 6 fuel oil tanks do not require testing under New York State Law (see the enclosed regulation 6 N.Y.C.R.R. PART 613.5 (A) (2) (i) 2. Waste oil was introduced in small quantities from about 1981 to 1989 for disposal as a fuel.In 1989, a new tank was built purposely for the storage of waste oil that is used as a fuel. 3. Analytical testing data from waste oil sampling conducted by Seneca Army Depot should be shown.	A - This section has been revised to reflect comments 1 and 2. The analytical data provided by R. Battaglia on 3-15-91 was not for SEAD-32. The data provided was collected at SEADS 28, 30, and 31. Thus the data has been referenced at these SWMUs.

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
NA	APPEND D SEAD-33	ALL	This section should be revised to reflect all SWMU-32.0 comments above. In addition , this section should reflect the contents of section 35.2.3 and 61.0 which are accurate. 2. This section should reflect the fact that waste oil is no longer brought to bldg. 121	A - This section has been revised accordingly.
NA	APPEND D SEAD-34	ALL	This section should be revised to reflect the comments given in this table for SEAD-32 and the text of 35.2.3 and section 61.0 which are accurate. Also , this section should be changed to reflect the fact that oil is no longer brought to building 319.	A - This section has been revised accordingly.
NA	APPEND D SEAD-36	ALL	This entire section needs to be revised to show only two waste oil burning boilers. The largest boiler is a coal fired unit that never burned waste oil.(This needs to be indicated)	A - This section has been revised accordingly.
NA	APPEND D SEAD-42, sec 42.2.5	1	All references to ".....Fort Durham...." need to be changed to read ".....Fort Drum....."	A- All references to Ft Durham have been replaced by Fort Drum.
NA	APPEND D SEAD 45, sec 45.3.1	1	This paragraph should be changed to reflect the fact that. "Explosives.....were burned on the pads". This practice is no longer done.	A - This paragraph has been revised accordingly.
NA	APPEND D SEAD 45, sec 45.2.2	1	Detonation hill is incorrectly stated to be included as a part of the OB\OD grounds. (See Draft Final Work Plan for the OB grounds RI/FS (Main/ 1991)).	W - Per conversation with G Battaglia on 3-12-91, detonation hill is designated as SEAD-45 (open detonation area).

LOCATION			ITEM /PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
NA	APPEND D SPAD -46, sec 46.3.3	1	The second line here should read ....into the soil, rather than ".....onto the soil....."	A -This sentence has been revised accordingly.
NA	APPEND D SPAD - 47,	1	The design features for building 321 and 806 are available from Seneca Army Depot, and this section needs to be updated accordingly.	A- The design features provided by R. Battaglia on 3-15-91 have been included in this Section.
NA	APPEND D SPAD- 48, sec 48.2.3.	1	This paragraph incorrectly states the approximate dates of usage for the pitchblende storage igloos. E-800 igloos are currently active.	A - This paragraph has been revised accordingly.
NA	APPEND D SPAD 50, sec 50.2.5.1	1	Add the following : This tank is currently empty.	A -This statement has been added.
NA	APPEND D SPAD-50, sec 50.2.5.2	1	Add the following : This tank is currently empty.	A - This statement has been added.
NA	APPEND D SPAD-50, sec 50.2.5.4	1	Add the following : This tank is currently empty.	A - This statement has been added.
GENERAL COMMENT			The use of footnotes is generally poorly done and needs to be revised. For instance, Footnotes are not in order. The first footnote is [4] which appears in section 1.2. Footnotes [1], [2], and [3] should precede footnote [4].	A - The footnotes have been revised to reflect this statement.
GENERAL COMMENT			The overall lack of page numbering is confusing. Most of the study consists of appendices, none of which contain page numbers.	A - The appendices have been numbered.

LOCATION	ITEM / PROBLEM AND ACTION REQUESTED	CONTRACTOR REPLY
GENERAL COMMENT	It seems inappropriate to include field notes and the contract/scope of work before the description of waste management units. The field notes appear more supplementary in nature and than belong in the back of the study. Is there a underlying reason (such as guidance documents) for organizing the study in its current sequence?	A - See comment below

The contract stated to include the scope of work as Appendix A. The other appendices were placed in the order in which they were referenced in the text. We have moved the SWMU descriptions to Appendix A since the contract does not require the scope of work to be included in the second submittal. The field notes are still included as Appendices B and C. Appendix D has been replaced with the AEHA report per Kevin Healy's request.

AEHA Comments

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ME-SG (40)

11 FEB 1991

MEMORANDUM FOR Division Engineer, U.S. Army Engineering Division - Huntsville, ATTN: CEHND-ED-PM (Mr. John Romeo), P.O. Box 1600, Huntsville, AL 35807-4301

Subject: Technical Review Comments for "Draft Submittal, Solid Waste Management Unit Classification Study, Seneca Army Depot, Romulus, New York", ERCE Project No. D063-001, Prepared for U.S. Army Corps of Engineers, Huntsville Division, 11 January 1991

1. The subject document was reviewed by USAEHA and comments are provided in the following paragraphs.

2. Appendix D, SEAD-13.
Comment: Defining ground-water quality at a site which cannot be accurately located could be very difficult.
Recommendation: The ground-water monitoring recommended for this site should be deleted, considering the time frame of usage, wastes placed in the pits, and the present site conditions.

3. Appendix D, SEAD-42 to SEAD-56, comments paragraphs 42.9 to 56.9.
Comment: The statement, "The U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) originally identified this facility as a SWMU in January 1980 (Reference 15)", is incorrect; because the term Solid Waste Management Unit (SWMU) was first defined in the 1984 Hazardous and Solid Waste Amendments.
Recommendation: Correct these paragraphs.

4. Appendix D, general comment
Comment: For those SWMU's where ground-water monitoring is recommended, one upgradient and two downgradient wells are typically specified. Unless the SWMU covers only a small area and the ground-water flow direction is already established, this number of monitoring wells is probably inadequate.
Recommendation: Monitoring well numbers and placement should be site-specific.

HSHB-ME-SG
SUBJECT: Technical Review Comments for "Draft Submittal, Solid Waste Management Unit Classification Study, Seneca Army Depot, Romulus, New York", ERCE Project No. D063-001, Prepared for U.S. Army Corps of Engineers, Huntsville Division, 11 January 1991

5. The point of contact is Mr. Wayne Fox, this Agency, DSN 584-2024 or commercial (301) 671-2024.

FOR THE COMMANDER:

PAUL R. THIES
LTC, MS
Chief, Waste Disposal Engineering Division

RESPONSE COMMENTS TO THE
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY'S
REVIEW COMMENTS

Response 1: Appendix D, SEAD-13

It has been reported that IRFNA was disposed in an area south of the Duck Ponds. The pollutants which may have been released during the disposal of the IRFNA include nitrates, nitrites, and flouride. We are of the opinion that this unit should be sampled since MCLs have been established for these pollutants.

Response 2: SEAD-42 to SEAD-56

These paragraphs have been revised accordingly.

Response 3: Appendix D, General Comment

Specific recommendations for sampling are to be submitted to the Huntsville Division in a separate report (see Task AM-4 of the contract). The report will provide the following information:

- Required types of sampling.
- Locations of and the rationale behind chosen sample locations.
- Cost estimates for sampling.

One upgradient and two downgradient ground-water monitoring wells have been recommended for SWMUs which cover a small area (less than 1.0 acre). We have specified three wells for these small units so that the ground-water flow direction can be assessed. In the event that more wells are required, they can be installed at a later date.

We have changed the sampling recommendations for SEAD-11 (Old Construction Debris Landfill). Previously we had recommended one upgradient and two downgradient ground-water monitoring wells. Since the SWMU covers a large area (approximately 4 acres) we have recommended that three wells be placed downgradient of the unit instead of two wells.

SCR Resolution Meeting Minutes 9-25-92

MINUTES TABLE 1

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-1	Building 307 - Hazardous Waste Container Storage Facility	Summary of Discussions: Historical use, regulation, compliance information, and building designs and specifications for this facility were scrutinized. Consensus: NYSDEC Federal Facilities will consult with applicable NYSDEC RCRA compliance authorities. The Army is not required to supply any additional information at this time. Upon consulting RCRA authorities, NYSDEC Federal Facilities will inform SEAD of its recommended classification for SEAD-1. This task will be performed expeditiously, so that the SCR can be updated accordingly. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-2	Building 301 - PCB Transformer Storage Facility	Summary of Oiscussions: Historical use, regulation, compliance information, and building designs and specifications for this facility were examined. Consensus: NYSDEC Federal Facilities will consult with applicable NYSDEC RCRA compliance authorities. The Army is not required to supply any additional information at this time. Upon consulting RCRA authorities, NYSDEC Federal Facilities will inform SEAD of its recommended classification for SEAD-2. This task will be performed expeditiously, so that the SCR can be updated accordingly. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-3	Incinerator Cooling Water Pond	Summary of Discussions: Limited. This SWMU is part of the Ash Landfill Operable Unit currently being addressed in a Remedial Investigation/Feasibility Study (RI/FS). Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-4	Munitions Washout Facility Leach Field	Summary of Discussions: Limited. This SWMU is being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). This workplan is under review by USEPA. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-5	Sewage Sludge Waste Piles	Summary of Discussions: Limited. The Army is currently making plans to conduct a CERCLA Site Investigation at this site. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-6	Abandoned Ash Landfill	Summary of Discussions: Limited. This unit is part of the Ash Landfill Operable Unit currently being addressed in a RI/FS. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-7	Shale Pit	Summary of Discussion: Past clean fill disposal practices were discussed. 6NYCRR Subpart 360-7, Construction and Demolition Landfill, regulations were reviewed. SEAD-7 receives only recognizable uncontaminated concrete, asphalt pavement, brick, soil and stone. Consensus: The shale pit does not pose a reasonable threat of release. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-8	Non-Combustible Fill Area	Summary of Discussions: Limited. This SWMU is part of the Ash Landfill Operable Unit currently being addressed in a RI/FS. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-9	Old Scrap Wood Site	Summary of Discussions: The Army agreed that this site may pose a reasonable threat of release due to past waste disposal uncertainties. Prior to this areas use as a scrap wood site, the area received landfill. The origin and nature of this landfill is unknown. Consensus: All parties agreed that, due to uncertainty regarding the site, further investigation is needed. Classification: NYSDEC-AOC, ARMY-Concur, USEPA-Deferred to earlier meeting.
SEAD-10	Present Scrap Wood Site	Summary of Discussions: Historical management of SEAD's current scrap woodpile was reviewed; past practices were discussed at length. Consensus: NYSDEC asked that limited sampling and analysis be performed at this site. SEAD agreed. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting. No Action
SEAD-11	Old Construction Debris Landfill	Summary of Discussions: Limited. This unit is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). This workplan is currently under USEPA review. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-12	Radioactive Waste Burial Sites - Location A: Northeast of Building 813 Location B: North of Building 804	Summary of Discussions: Limited. The Army is currently making plans to conduct a CERCLA Site Investigation at this site. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meeting. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-13	IRFNA Disposal Site	Summary of Discussions: Limited. This unit is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. This workplan is under USEPA review. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-14	Refuse Burning Pits (2 units)	Summary of Discussions: This SWMU is part of the Ash Landfill Operable Unit currently being addressed in a RI/FS. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-15	Building 2207 - Abandoned Solid Waste Incinerator	Summary of Discussions: Limited. This unit is a part of the Ash Landfill Operable Unit currently being addressed in a RI/FS. Consensus: All parties were in agreement prior to the 21-22 Sept meetings. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-16	Building S-311 - Abandoned Deactivation Furnace	Summary of Discussions: Limited. This SWMU is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). This workplan is under review by USEPA. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-17	Building 367 - Existing Deactivation Furnace	Summary of Discussions: Limited. This SWMU is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). This workplan is currently under USEPA review. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-18	Building 709 - Classified Document Incinerator	Summary of Discussions: The nature of past document burning in this incinerator, including types of paper burned, volumes, and incinerator specifications were discussed. Consensus: The Army is not required to provide any additional information in support of this unit's classification. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-19	Building 801 - Classified Document Incinerator	Summary of Discussions: The nature of past document burning in this incinerator, including types of paper burned, volumes, and incinerator specifications were discussed. Consensus: The Army is not required to provide any additional information in support of this unit's classification. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-20	Sewage Treatment Plant No. 4	Summary of Discussions: The Army asserted that the sewage treatment plants that are regulated and in compliance with the NYSDEC SPDES program is unwarranted. The NYSDEC acknowledged and reviewed the SPDES permit effluent limitations provided in the SCR. Consensus: The Army is not required to provide any additional information in support of this unit's classification. Classification: NYSDEC-No Action, ARMY-Concur, USEPA-Deferred to earlier meeting.
SEAD-21	Sewage Treatment Plant No. 715	Summary of Discussions: The Army asserted that the sewage treatment plants that are regulated and in compliance with the NYSDEC SPDES program is unwarranted. The NYSDEC acknowledged and reviewed the SPDES permit effluent limitations provided in the SCR. Consensus: The Army is not required to provide any additional information in support of this unit's classification. Classification: NYSDEC-No Action, ARMY-Concur, USEPA-Deferred to earlier meeting.
SEAD-22	Sewage Treatment Plant No. 314	Summary of discussions: The Army asserted that the sewage treatment plants that are regulated and in compliance with the NYSDEC SPDES program is unwarranted. The NYSDEC acknowledged and reviewed the SPDES permit effluent limitations provided in the SCR. Consensus: The Army is not required to provide any additional information in support of this unit's classification. Classification: NYSDEC-No Action, ARMY-Concern, USEPA-Deferred to earlier meeting.

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-23	Open Burning Grounds	Summary of Discussions: Limited. This SWMU has graduated to the operable unit stage and is currently being addressed in an a RI/FS. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-24	Abandoned Powder Burning Pit	Summary of Discussions: Limited. This SWMU is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). This workplan is under USEPA review. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-25	Fire Training and Demonstration Pad	Summary of Discussions: Limited. This unit is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN January 1992). This workplan is currently under USEPA review. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meeting. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-26	Fire Training Pit	Summary of Discussions: Limited. This SWMU is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/ 1992). This workplan is currently under USEPA review. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meeting. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-27	Building 360 - Steam Cleaning Waste Tank	Summary of Discussions: SEAD provided a status update on the RCRA Hazardous Waste Tank Closure Plan that is being reviewed by NYSDEC RCRA Compliance Authorities. SEAD agreed to provide the NYSDEC with sampling and analysis results when generated. If significant soil or groundwater contamination is encountered, cleanup of this site will be deferred to the CERCLA/IAG cleanup process. Consensus: The Army will forward to NYSDEC the closure plan sampling and analysis results when available. SEAD-27 will continue to be addressed under supervision of NYSDEC RCRA authorities. The proper classification of this unit will be determined based on closure test results. SEAD will strive to complete the closure process in time to avoid SCR finalization delays. Classification: NYSDEC-Reserved, ARMY-Concur, USEPA-Deferred to earlier meeting.

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-28	Building 360 - Underground Waste Oil Tanks (2 Units)	Summary of Discussions: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of these tanks were reviewed. Consensus: Seneca will submit to the NYSDEC tank tightness results dated 1988. The tightness results indicated that the tanks did not leak. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-29	Building 732 - Underground Waste Oil Tank	Summary of Discussion: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of this tank were reviewed. Consensus: Seneca will schedule this 1982 fiberglass tank for tightness testing in the near future. The results of this test will be included in the revised SCR and will subsequently determine SEAD-29's classification. Classification: NYSDEC-Reserved, ARMY-Concur, USEPA-Deferred to earlier meeting.
SEAD-30	Building 118 - Underground Waste Oil Tank	Summary of Discussions: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of this tank were reviewed. This tank is scheduled for removal in the near future by the SEAD in-house tank removal team. This tank is known to have taken on water and leakage is expected to have occurred. SEAD explained that the removal will be undertaken in unison with NYSDEC Region 8 regulatory authorities. If contamination is discovered when this tank is removed, soil excavation will be performed and soil sampling will be undertaken. Soil samples will be tested for the parameters mandated by the NYSDEC Region 8 Division of Water. These tests will be accomplished using the analytical methods and protocols required by Region 8, including laboratory requirements to meet established practical quantitation limits. Sample results will be forwarded to Region 8, who will make the determination whether or not the site remains contaminated after the cleanup has been completed; provided removal of contaminated soils is necessary. The test results will be incorporated into the SCR. Consensus: Analytical results from samples taken during the in-house removal project will be used to determine this unit's classification. The results will be forwarded to NYSDEC Federal Facilities Section. Classification:NYSDEC-Reserved, ARMY- Concur, USEPA-Deferred to earlier meeting

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-31	Building 117 - Underground Waste Oil Tank	Summary of Discussions: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of this tank were reviewed. Consensus: Seneca will submit to the NYSDEC tank tightness results dated 1988. If the tightness results indicate that the tank has not leaked, NYSDEC will consider SEAD-31 a no action SWMU. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-32	Building 718 - Underground Waste Oil Tanks (2 Units)	Summary of Discussions: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of these tanks were reviewed. These tanks held virgin number 6 fuel oil; waste oil from all the waste oil tanks was blended for use as a used oil fuel. The oil is burned in boilers which generate steam used for heating buildings. The Army stated that tightness testing of tanks containing number 6 fuel oil is technologically infeasible and not required under 6 NYCRR Part 613.5 and 40 CFR Part 266. Sampling groundwater by installing 1.5 inch groundwater monitoring wells was discussed. Consensus: Limited sampling of building 718 waste oil tank is warranted. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-33	Building 121 - Underground Waste Oil Tank	Summary of Discussions: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of this tank were reviewed. This tank held virgin number 6 fuel oil; waste oil from all the waste oil tanks was blended for use as a used oil fuel. The oil is burned in boilers to generate steam used for heating buildings. The Army stated that tightness testing of tanks containing number 6 fuel oil is technologically infeasible and not required under 6 NYCRR Part 613.5 and 40 CFR Part 266. Sampling groundwater by installing 1.5 inch groundwater monitoring wells was discussed. Consensus: Limited sampling of building 121 waste oil tank is warranted. Classification:NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-34	Building 319 - Underground Waste Oil Tank (2 Units)	Summary of Discussions: The type of fuel stored, tank type (fiberglass or steel), and fuel capacity of this tank were reviewed. This tank held virgin number 6 fuel oil; waste oil from all the waste oil tanks was blended for use as a used oil fuel. The oil is burned in boilers to generate steam used for heating buildings. The Army stated that tightness testing of tanks containing number 6 fuel oil is technologically infeasible and not required under 6 NYCRR Part 613.5 and 40 CFR Part 266. Sampling groundwater by installing 1.5 inch groundwater monitoring wells was discussed. Consensus: Limited sampling of building 319 waste oil tank is warranted. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-35	Building 718 - Waste Oil Burning Boilers (3 Units)	Summary of Discussions: SCR photographs of building 718 waste oil burning boilers were inspected. Design features, including capacity ratings and boiler combustion rates, were reviewed. Consensus: No additional information, sampling or documentation is required. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-36	Building 121 - Waste Oil Burning Boilers (2 Units)	Summary of Discussions: SCR photographs of building 121 Waste oil burning boilers were inspected. Design features, including capacity ratings and boiler combustion rates, were reviewed. Consensus: No additional information, sampling or documentation is required. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-37	Building 319 - Waste Oil Burning Boilers (2 Units)	Summary of Discussions: SCR photographs of building 319 Waste oil burning boilers were inspected. Design features, including capacity ratings and boiler combustion rates, were reviewed. Consensus: No additional information, sampling or documentation is required. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-38	Building 2079 - Boiler Plant Blowdown Leach Pit	Summary of Discussions: Current and historical operating practices were reviewed. Consensus: A limited sampling effort is warranted. This SWMU will be classified based on these sampling results. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-39	Building 121 - Boiler Plant Blowdown Leach Pit	Summary of Discussions: Current and historical operating practices were reviewed. Consensus: A limited sampling effort is warranted. This SWMU will be classified based on these sampling results. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-40	Building 319 - Boiler Plant Blowdown Leach Pit	Summary of Discussions: Current and historical operating practices were reviewed. Consensus: A limited sampling effort is warranted. This SWMU will be classified based on these sampling results. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-41	Building 718 - Boiler Plant Blowdown Leach Pit	Summary of Discussions: Current and historical operating practices were reviewed. Consensus: A limited sampling effort is warranted. This SWMU will be classified based on these sampling results. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-42	Building 106 - Preventive Medicine Laboratory	Summary of Discussions: Operating practices at the SEAD Preventative Medicine Laboratory were reviewed. The volume and nature of infectious waste generated was discussed, as well as disposal practices consistent with applicable regulations. SEAD restated that no materials containing radioactive isotope are utilized, generated, or disposed of at the clinical laboratory. Consensus: The Army is not required to provide any additional information, conduct any sampling, or provide further documentation. Classification: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-43	Building 606 - Old Missile Propellant Test Laboratory (refer to SEAD-56)	Summary of Discussions: Limited. This SWMU is scheduled to be addressed in a CERCLA Site Investigation. The fact that SEAD-43, SEAD-56 and SEAD-69 are located in the same geographical area was discussed. Consensus: Uncertainties associated with former operations at this site warrants investigation. SEAD-43, 56, and 69 should remain classified as individual units for purposes of the SCR. The area will be addressed cumulatively as an AOC for purposes of the Army's planned CERCLA Site Investigation Workplan. Classification: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-44	Quality Assurance Test Laboratory - Location A: West of Building 606 Location B: Brady Road	Summary of Discussions: Limited. The Army is currently making plans to conduct CERCLA Site Investigations at this site. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-45	Demolition Area	Summary of Discussions: Limited. This unit is being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992).The workplan is being reviewed by USEPA. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-46	Small Arms Range Location A: Berm Location B: Circular Berm	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Both locations of SEAD-48 were visited by the NYSDEC and USEPA representatives named in the list of attenders. The Circular Berm location is not described in the SCR (ERCE April 12, 1991) since the berm was recently discovered by Depot officials. Consensus: All parties were in agreement regarding Location A's classification prior to the 21-22 Sept 92 meetings. The Army agreed to investigate both areas for unexploded ordinance (rockets) and associated contamination, not spent small arms casings and bullets Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-47	Building 321 and 806 - Radiation Calibration Source Storage	Summary of Discussions: The nature of radiation calibration material storage at SEAD-47 was detailed. The range of radioactivity associated with the calibration sources is in the range of micrograms of solid material. Consensus: The extremely low level materials pose no human health or environmental risk at buildings 321 and 806. Classifications: NYSDEC-No Action, Army-Concur, USEPA-Deferred to earlier meeting
SEAD-48	Pitchblende Storage Igloos	Summary of discussions: NYSDEC cited Mr. Gary Kittell, SEAD, at the recent TRC meeting in which he discussed conducting a CERCLA re-look at this site. Mr. Battaglia, SEAD, mentioned that a reinvestigation may not be warranted. NYSDEC requested a review of data generated for the closeout report for the previous cleanup. This data will be reevaluated by NYSDEC. A NYSDEC radiation expert may conduct a limited radiological survey of SEAD-48. NYSDEC Federal Facilities Branch will consult NYSDEC radiological authorities regarding SEAD-48. Consensus: SEAD will submit to NYSDEC additional reports for the previously conducted cleanup of the E-800 row. The Army has not been recommended to conduct any additional sampling at this time. NYSDEC will contact SEAD regarding its interpretation of the additional report data. All follow up actions conducted by the Army and NYSDEC will be done in a manor consistent with the schedule for SCR finalization. Classifications: NYSDEC-Reserved, SEAD-No-Action, USEPA-Deferred to earlier meeting.

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-49	Building 356 - Columbite Ore Storage	Summary of Discussions: Limited sampling of the columbite ore storage facility was discussed, including naturally occurring interferences to radiological surveys (i.e. radon gas). A NYSDEC radiation expert may visit SEAD to perform a basic radiation survey. Consensus: The Army will conduct limited sampling at building 356. The results of the limited sampling effort will be used in determining this units final classification. NYSDEC and SEAD will schedule a day for conducting the radiation scan. Classifications: NYSDEC-Reserved, Army-Concur, USEPA-Deferred to earlier meeting.
SEAD-50	Tank Farm (refer to SEAD-54)	Summary of Discussions: Limited. This unit is scheduled to be addressed under a CERCLA Site Investigation Workplan. SEAD-50 will be combined with SEAD-54 as a single AOC in future Site Investigation Workplans. The two units will remain as separate SWMU's in the SCR. Consensus: All parties were in agreement regarding this units classification prior to meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Concur
SEAD-51	Herbicide Usage - Perimeter of High Security Area	Summary of Discussions: The NYSDEC will consult with relevant NYSDEC FIFRA regulatory authorities. The Army will supply the NYSDEC with three reports that pertain to pesticide use around the high security area. These reports are: "*Pesticide Monitoring Survey no. 17-44-0240-84 Evaluation Of Pesticide Distribution In Select Components of Seneca Army Depot* (AEHA/1984)" and "*Pesticide Monitoring Special Study No. 17-44-0987-84 Analysis of Environmental Samples for Herbicide Content, Seneca Army Depot Activity* (AEHA/1983)" and "*Installation Assessment of Seneca Army Depot Report No. 157* (USATHAMA/1980)". SEAD agreed to supply NYSDEC with a material safety data sheet for Borocil (a Borax and Bromacil mixture). SEAD's use of integrated pest management and the SEAD pest management plan was discussed. NYSDEC and NYSDOH raised concerns over possible future use/residential exposure scenarios. Consensus: The NYSDEC and NYSDOH recommended that, at a minimum, limited sampling be performed at this site. SEAD will provide NYSDEC Federal Facilities Section with the NYSDEC FIFRA program point of contact who is familiar with SEAD's historical herbiciding program. The NYSDEC and Army will re-evaluate analytical results contained in previous studies with respect to current action levels. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Not Present

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-52	Buildings 608 and 612 - Ammunition Breakdown Area	Summary of Discussions: SEAD provided an overview of the munitions breakdown and maintenance operations at SEAD-52, which included a site visit of building 612 and adjacent storage buildings. It was explained by the Army that materials at building 612 were handled within a dry system. Consensus: Although building 612 does not warrant further investigation, limited sampling of soil adjacent to storage buildings 608, 610, and 611 should be conducted. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Not Present
SEAD-53	Munitions Storage Igloos	Summary of Discussions: The Army asserted that munitions storage igloos are used for product storage and by definition should not be considered Solid Waste Management Units. The Army and USEPA policy regarding the issue of when a munition becomes a waste was briefly discussed. Typical munitions storage igloo design specifications were reviewed. Potential release (i.e munitions spillage) and migration scenarios were hypothesized. The Army emphasized that any release, migration, and exposure scenario is difficult to comprehend in light of the igloos thick cement construction and the physical and chemical nature of the munitions housed in the igloos. Consensus: The NYSDEC maintains that a release from a storage igloo must not be completely ruled out, and prefers to keep the issue of future investigation of SEAD munitions igloos open. NYSDEC recommended that the storage igloos be a low priority for further investigation. NYSDEC agreed to allow a no action classification in the SCR provided the Army qualify this classification by stating that the investigation of munition storage igloos may be revisited should further information regarding a release become available. Classification: NYSDEC-No Action (but qualified), Army-No Action, USEPA-Not Present
SEAD-54	Asbestos Storage (refer to SEAD-50)	Summary of Discussions: SEAD-50 will be combined with SEAD-54 as a single AOC in future site Investigation Workplans. The two units will remain as separate SWMU's in the SCR. Consensus: The Army agreed with NYSDEC that this SWMU should be investigated. classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-55	Building 357 - Tannin Storage	Summary of Discussions: The tannin storage site was visited by the list of meeting attenders. Tannic Acid, a carboxylic acid derivative, is neither a listed hazardous waste or substance. Consensus: The Army is not required to provide any additional information in support of this unit's classification Classification: NYSDEC-No Action, Army-Concur, USEPA-Not Present
SEAD-56	Building 606 - Herbicide and Pesticide Storage (refer to SEAD-43)	Summary of Discussions: The Army and NYSDEC agreed that SEAD-43, SEAD-56 and SEAD-69 will be addressed as a single Area of Concern in a future CERCLA Site Investigation Workplan. Consensus: SEAD-43, 56, and 69 will remain classified as individual units for purposes of the SCR. The area will be addressed cumulatively as an AOC for purposes of future CERCLA Site Investigation Workplan. Classification: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-57	Explosive Ordnance Disposal Area	Summary of Discussions: Limited. This unit is currently being addressed under the Workplan for CERCLA Investigation of eleven Solid Waste Management Units (MAIN/January 1992). The workplan is being reviewed by USEPA. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-58	Debris Area Near Booster Station 2131	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-59	Fill Area West of Building 135	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-60	Oil Discharge Adjacent to Buildings 606 or 612	Summary of Discussions: Limited. This unit is scheduled to be addressed under a future Workplan for conducting a CERCLA Site Investigation. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-61	Building 718 - Underground Waste Oil Tank	Summary of Discussions: Limited. This is a double wall fiberglass tank installed in 1989. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-No Action, Army-Concur, USEPA-Not Present
SEAD-62	Nicotine Sulfate Oisposal Area Near Buildings 606 or 612	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-63	Miscellaneous Components Burial Site	Summary of Discussions: Mr. Battaglia, SEAD, suggested that this SWMU is a good candidate for conducting a removal action. Mr. Battaglia asserted that removals could be conducted in-house and would provide an avenue for continued employment opportunity at the Depot. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-64	Garbage Disposal Areas - Location A: Debris Landfill South of Storage Pad Location B: Disposal Area South of Classification Yards Location C: Proposed Landfill Site Location D: Disposal Area Waste of Building 2203	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-65	Acid Storage Areas	Summary of Discussions: This site was visited by the list of attenders. Sulfuric Acid was believed stored at this site. Consensus: The Army is not to required to provide any additional information in support of this units classification. Classification: NYSDEC-No Action, Army-Concur, USEPA-Not Present
SEAD-66	Pesticide Storage Near Buildings 5 and 6	Summary of Discussions: This site was visited by the list of attenders. Consensus: NYSDEC requested that only limited sampling be conducted at this site. Classification: NYSDEC-Reserved, Army-concur, USEPA-Not Present

UNIT NUMBER	UNIT NAME	AGREEMENTS
SEAD-67	Dump Site East of Sewage Treatment Plant No. 4	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-68	Building S-335 - Old Pest Control Shop	Summary of Discussions: Limited. This unit is scheduled to be addressed in a CERCLA Site Investigation Workplan. Consensus: All parties were in agreement prior to the 21-22 Sept 92 meetings. Classifications: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-69	Building 606 - Disposal Area	Summary of Discussions: The Army and NYSDEC agreed that SEAD-43, SEAD-56 and SEAD-69 will be addressed as a single Area of Concern in a future CERCLA Site Investigation Workplan. Consensus: SEAD-43, 56, and 69 will remain classified as individual units for purposes of the SCR. The area will be addressed cumulatively as an AOC for purposes of future CERCLA Site Investigation Workplan. Classification: NYSDEC-AOC, Army-Concur, USEPA-Not Present
SEAD-70	Building 2110 Fill Area	Summary of discussions: Limited. The Army feels this site should be investigated further because of past waste disposal uncertainties. Consensus: Further investigation is warranted. Classifications:NYSDEC-AOC, Army-concur, USEPA-Not Present
SEAD-71	Alleged Paint Disposal Area	Summary of Discussions: Limited. The Army feels this site should be investigated further because of past waste disposal uncertainties. SEAD explained that this unit was recently listed based on a rumor from a retiring employee. Consensus: Further investigations are required. Classification: NYSDEC-AOC, Army-AOC, USEPA-Not Present
SEAD-72	Mixed Waste Storage Facility Building 803	Summary of Discussions: Historical use, regulation, compliance information, and building designs and specifications for this facility were scrutinized. Consensus: NYSDEC Federal Facilities Section will consult with applicable NYSDEC RCRA Compliance Authorities. The Army is not required to supply any additional information at this time. Upon consulting RCRA authorities, NYSDEC Federal Facilities will inform SEAD of its recommended classification for SEAD-72. This task will be performed expeditiously so that the SCR can be updated accordingly. Classification: NYSDEC-Reserved, Army-Concur, USEPA-Not Present

NYSDEC Comments

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

Langdon Marsh
Acting Commissioner

May 23, 1994

Mr. Stephen Absolom
Seneca Army Depot
Romulus, NY 14541

RE: SEAD 28 - Building 355 Tank Removal

Dear Mr. Absolom:

During the May 17, 1994 project manager's meeting, Mr. Randy Battaglia distributed a current status sheet for the underground waste oil storage tanks located near buildings 355, 732, 117 and 718 (SEAD 28, 29, 31 and 32 respectively). This status sheet reported that Tank 355W contained approximately 300 gallons of water and was removed on July 16, 1993.

The NYSDEC is flabbergasted at the Army's action of undertaking a removal action without proper notification to the NYSDEC, and indeed constitutes a breach of the Interagency Agreement section 11.2(a) and (b). We are particularly concerned about the source of the 300 gallons water found in the tank. If this water was the result of seepage from groundwater, the possibility exists that the waste oil from the tank was displaced and has contaminated the groundwater.

We would like to remind you that in the future you take pains to inform us of any removal action, or other action that may come under the provisions of the IAG. Meanwhile, we require that SEAD 28 (Bldg. 355) be classified as an Area of Concern in the SWMU Classification Report.

If you have any questions, please call me at (518) 457-3976.

Sincerely,

Kamal Gupta

Kamal Gupta, P.E.
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation

cc: R. Battaglia, SEAD
C. Struble, USEPA
K. Healy, USACE
M. Duchesneau, Eng. Sci.
L. Rafferty, NYSDOH

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 7010

Thomas C. Jorling

September 21, 1993

27 SEP RECD

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL
# of pages ▷ 14
To [redacted]
From K. BATTAGLIA
Dept./Agency ENG-SEC
Phone #
Fax #
NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Mr. Randall Battaglia
Environmental Coordinator
Seneca Army Depot
Romulus, NY 14541

Re: SWMU Classification Report

Dear Mr. Battaglia:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the additional information for SEAD 10, 28, 29, 30, 31, 51 and 72 and has concluded the following:

SEAD 10: Present Scrap Wood Pile: The TCLP results of the ash generated at the site is below the regulatory limits. This SWMU may be classified as a No Action SWMU.

SEAD-28, 29, 30 and 31: Underground Waste Oil Tanks: These tanks were tested for tightness in 1988. Since then, if these tanks have not been replaced, another tightness test should be conducted to verify their integrity. If these tanks have been replaced, results of any sampling undertaken at that time should be provided. All future activities at the underground waste oil tanks should continue to be coordinated with the Region 8 Division of Water with the Federal Projects Section, Division of Hazardous Waste Remediation, Central Office receiving copies of all associated documents.

SEAD 51: Herbicide Usage - Perimeter of High Security Area: A total of sixteen soil samples, two air samples and one water sample from the high security area were taken in 1983 and analyzed for 2,4-D, 2,4,5-T and silex. Test results indicate the presence of these analytes in three soil samples.

The 1983 analysis did not include analysis for other herbicides which were used at the base, like bromacil, arsenal, roundup (glyphosate), tordon 10K (picloram), simiazine 80W, borocil lv, and dioxin (which is a contaminant found in 2,4,5-T). We therefore recommend that this SWMU be classified as an Area of Concern.

SEAD 72: Mixed Waste Facility, Bldg. 803: There is little historical information provided regarding the use of this building. Reportedly, this building was used by the Atomic Energy Commission (AEC) for laundry operations. A site visit of the building indicated that the floor drains are plugged. It is therefore important that the Army locate the exit of the floor drains and take samples for appropriate parameter at the discharge point. The classification of this SWMU should be based on the results of this sampling event.

In addition, a team from NYSDEC and NYSDOH consisting of Messrs. Marsden Chen, Kamal Gupta and Gary Baker performed a radiological survey of SEAD-48-Pitchblende Storage Igloos; 802, 804, 806, 808, 809 and 710 (background location outside) and SEAD 49-Columbite Ore Storage, buildings 356, 357 and 324. Soil and wipe samples were taken from Igloos 804, 806, 808 and 710 and buildings 324, 356 and 357. The results of the survey and samples are enclosed. Based on results, the following classification is recommended:

-SEAD-48-Pitchblende Storage Igloos - Area of Concern
-SEAD-49-Columbite Ore Storage Building 356 - No Action SWMU

Please provide the work plan and schedule for Limited Sampling at SEAD 28, 29, 30, 31, 32, 33, 34, 38, 39, 40, 41, 52, 66 and 72 as decided in the meeting of September 21 and 22, 1992.

If you have any questions, please call me at (518) 457-3976.

Sincerely,

Kamal Gupta
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation

Enclosures

cc: S. Absolom, SEAD
C. Struble, USEPA
L. Rafferty, DOH
G. Baker, NYSDOH-Syracuse

STATE OF NEW YORK - DEPARTMENT OF HEALTH

INTEROFFICE MEMORANDUM

TO: William Condon, Chief, Environmental Radiation Section
Bureau Environmental Radiation Protection

FROM: Gary H. Baker, Principal Radiological Health Specialist
Bureau Environmental Radiation Protection

SUBJECT: Seneca Army Depot Site Survey Results of 6/10/93

DATE: September 7, 1993

Summary-

DEC and BERP staff performed a site survey of the Seneca Army Depot on 6/10/93. The survey results indicate that there are several areas of contamination inside and outside of igloo E0804 and one hot spot in igloo E0808 which require further remediation. The areas of contamination in Building E0804 are along the concrete drainage ditch, in the outside drains which exit the building on the North wall at a height of one to two feet above ground level, and in the soil outside near the drains. The debris samples taken inside Building E0804 and in one spot in Building E0808 and the soil samples appear to have elevated concentrations of U-238 and Ra-226.

Details-

On 6/10/93, Kamal Gupta and Marsden Chen of the NYSDEC and Gary Baker of the NYSDOH made a site visit of the Seneca Army Depot to investigate possible contamination in three areas as follows: a) Buildings 356 section 4, 357 section 4 and 324 which had been used to store Columbite ore. b) Storage igloos E0801 to E0811 which had been used to store pitchblend and c) Building 803 which is used for storage of radioactive materials and waste.

Upon arrival at the site, state DEC and DOH staff met with Steve Absalah, Jim Miller, and Randy Bataglia of the site environmental office. Jim Miller accompanied the DEC and DOH staff during the surveys of the buildings and grounds. Surveys were conducted of buildings 356, 357 and 324; storage igloos numbers 802, 804, 806, 808, 809, 710 (background location outside); and Building 803. Following the site survey, DOH and DEC staff met with the Army environmental staff to discuss the survey findings. A videotape of the cleanup was provided.

Survey methodology-

The following instruments were used to perform surveys: a NYSDOH Ludlum microR meter model 12S ser. 25116, calibrated on 10/27/92; a NYSDEC Ludlum Model 3-98 with internal GM probe and external NaI probe calibrated 11/4/92

Ser. 69783; and a NYSDOH Eberline E-120 GM survey meter Ser. 6650, calibrated 6/23/92.

Gamma survey readings were taken using both the micro R meter and the DEC instrument in external mode. Beta readings were taken using the E-120 with HP190. The microR and DEC instrument were compared for accuracy prior to surveying using a 1 microCurie Cs-137 source and background readings. Also, instrument readings were compared several times during the surveys until the DEC instrument's external probe failed to operate during a survey of the drain on Igloo E0806. It was noted that the DEC instrument readings had to be divided by 170 to obtain micro/hr from cpm. Soil, debris, and wipes samples were taken in the areas with the highest readings.

During the survey of building 356 it was noted that the Columbite Ore (5,284 drums) had been transfered from Building 356 to a DLA facility in Binghamton, N.Y. approximately two weeks prior to the survey date. A sample of the ore can be obtained from the Binghamton facility if needed. The Army has plans to clean building 356 with a HEPA filtered vacuum system. All areas and buildings where the ore had been stored were surveyed and wipes were taken for analysis.

Results-

With the exception of igloo E0804 and one hot spot in E0808 which showed elevated readings, no significant deviations from background were noted in the buildings and storage igloos.

The following is a summary of survey readings recorded and sample locations:

Survey meter readings-

Location-Readings (microR/hr;E-120 GM)

Background areas 4-15 microR/hr; 20-40 cpm

324 Building 324-All areas 6-8 micro R/hr; Brick column 10 microR/hr

356 section 4 at wipe #1 Building 356 - 12 microR/hr; 20 cpm

356 section 4 at wipe #2 Building 356 - 15 microR/hr

356 section 4 at wipe #3 Building 356 - 9.4 microR/hr; 20 cpm

357 section 4 at wipe #2 Building 357 - 6 microR/hr; 20 cpm

William Condon, Chief, Environmental Radiation Section

357 section 4 at wipe #3 Building 357 - 6 microR/hr; 20 cpm

E0802 Inside and outside and in drains - 8-10 microR/hr

E0804 Inside of igloo E0804 along East Wall Center (40' from North wall- 40 microR/hr; 400 cpm beta

E0804 Surface Soil next to drain on North wall (East side) - 47 microR/hr; 100 cpm beta

E0804 Soil at depth of 4-6 inches depth outside drain North Wall East side - 106 microR/hr (18000cpm with DEC instr.)

E0804 Wall at drain East side 40 microR/hr maximum

E0804 Outside rear - 4 microR/hr (approximately 10' from South Wall)

E0804 Outside front - (approximately 10' from North Door - 4 microR/hr)

E0804 Inside of igloo E804 at corner of South and East Walls - 12 microR/hr

E0804 Inside 30' from North Wall 16-18 uR/hr; 200 cpm beta

E0804 Inside along East Wall floor 6' from South Wall - 12 microR/hr; 350 cpm beta

E0804 In drainage ditch outside approximately 12' from North Wall 10-18 uR/hr

E0804 Outside North Wall at west drain 18 uR/hr; (12 uR/hr at one meter from wall

E0806 Most areas 8-12 microR/hr; 13 microR/hr
West drain inside, 20' from North Wall; 2300 cpm beta

E0806 Outside both East and West drain outlets - 12 microR/hr; 20 cpm beta

E0808 Inside and Outside at drains to 10 microR/hr;20-30 cpm beta
West drainage ditch, 10' from North Wall- 40-60 cpm beta

E0809 7 to 8 microR/hr; 20-30 cpm beta; West drain- 8 microR/hr; 20 cpm beta

E0809 Outside East drain - 11 microR/hr; 20 cpm beta
Outside West drain - 10 microR/hr; 20 cpm beta

William Condon, Chief, Environmental Radiation Section

357-2 Building 357 <20 dpm/<20 dpm

357-3 Building 357 <20 dpm/<20 dpm

E0804W1 Igloo E0804 (East wall 60' from North Wall - wipe of drain area.
77 + 6 dpm/48 + 3 dpm

E0804W2 Igloo E0804 52 + 5 dpm 54 + 4 dpm

E0806W1 Igloo E0806 <20 dpm/<20 dpm

cc: Dr. Rimawi
Mr. Huang

SAMPLE ID:93208356-5 SAMPLE RECEIVED:93/06/18 CHARGE 5.00
PROGRAM: 17:STATE-WIDE RADIATION SURVEILLANCE PROGRAM
SOURCE ID: DRAINAGE BASIN: GAZETTEER CODE:4955
POLITICAL SUBDIVISION:ROMULUS COUNTY:SENECA
LATITUDE: LONGITUDE: Z-DIRECTIONAL:
LOCATION: SENECA ARMY DEPOT ROMULUS - ON SITE
DESCRIPTION:#1-E080451-SOIL INSIDE IGLOO 804 IN HOT SPOT IN DRAIN
DESCRIPTION:EAST WALL CENTER
REPORTING LAB: 20:NUCLEAR CHEMISTRY LABORATORY
TEST PATTERN: 20-0046:U235,U238,TH232,RA226,CS137,K40
SAMPLE TYPE: 600:SOIL, SAND
TIME OF SAMPLING: 93/06/11 : DATE PRINTED:93/07/21

ANALYSIS: 20-0046 - U235,U238,TH232,RA226,CS137,K40

PARAMETER	RESULT
URANIUM-238 (TH-234)	2.0E 1 +/- 1.0E 1 PCI/G
THORIUM-232 (AC-228)	< 1.E 0 PCI/G
RADIUM-226 (BI-214)	3.3E 1 +/- 0.4E 1 PCI/G
POTASSIUM - 40	< 1.5E 1 PCI/G
CESIUM - 137	< 2.E-1 PCI/G
URANIUM - 235	6.E-0 +/- 9.E-0 PCI/G

**** END OF REPORT ****

RECEIVED
SEP 08 1993

COPIES SENT TO: CO(1) - RO(1) - CHIEF(1) - FEDEX - UNITED PARCEL - SNED-G(1)
JAMES HUANG
BUREAU ENVIRONMENTAL RADIATION PROTECT.
NY STATE DEP'T HEALTH SUBMITTED BY:DIEGERT
FT UNIVERSITY PLACE
ALBANY ***INTERAGENCY MAIL***

ACCT ID:9320835620 SAMPLE RECEIVED:93/06/16 CHARGE: 0.00
PROGRAM: 17:STATE WIDE RADIATION SURVEILLANCE PROGRAM
SOURCE ID: DRAINAGE BASIN: GAZETTEER CODE:4955
POLITICAL SUBDIVISION:ROMULUS COUNTY:SENECA
LATITUDE: LONGITUDE: E-DIRECTION:
LOCATION: SENECA ARMY DEPOT ROMULUS - ONE SITE
DESCRIPTION:#2-E080452-SURFACE SOIL NEXT TO DRAIN ON NORTHWALL E SIDE
DESCRIPTION:OF IGLOO 804
REPORTING LAB: 20:NUCLEAR CHEMISTRY LABORATORY
TEST PATTERN: 20-0046:U235,U238,TH232,RA226,CS137,K40
SAMPLE TYPE: 600:SOIL, SAND
TIME OF SAMPLING: 93/06/11 : DATE PRINTED:93/07/21

ANALYSIS: 20-0046: U235,U238,TH232,RA226,CS137,K40

PARAMETER	RESULT	
URANIUM-238 (TH-234)	1.59E 1 +/- 0.13E 1	PCI/G
THORIUM-232 (AC-228)	2.1E 1 +/- 2.5E 0	PCI/G
RADIUM-226 (BI-214)	2.41E 1 +/- 0.08E 1	PCI/G
POTASSIUM - 40	1.80E 1 +/- 0.13E 1	PCI/G
CESIUM - 137	7.9E -1 +/- 0.2E -1	PCI/G
URANIUM - 235	6.2E 0 +/- 0.6E 0	PCI/G

**** END OF REPORT ****

COPIES SENT TO: 20(1) - ROOM 1, TOWER BLDG - ALBANY

JAMES HUANG
BUREAU ENVIRONMENTAL RADIATION PROTECT.
NYS STATE DEPT. HEALTH SUBMITTED BY:HALEY
UNIVERSITY PEACE
ALBANY ***INTERAGENCY MAIL***

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

ACE ID:9320835621 SAMPLE RECEIVED:93/06/16 CHARGE: 5.00
PROGRAM: 12:STATE-WIDE RADIATION SURVEILLANCE PROGRAM
SOURCE ID: DRAINAGE BASIN: GAZETTEER CODE:4955
POLITICAL SUBDIVISION:ROMULUS COUNTY:SENECA
LATITUDE LONGITUDE DIRECTION:
LOCATION: SENECA ARMY DEPOT ROMULUS ON SITE
DESCRIPTION:#3-E080454-SOIL @ DEPTH OF 4-6INS. OUTSIDE DRAIN NORTHWALL
DESCRIPTION:EAST 804
REPORTING LAB: 20:NUCLEAR CHEMISTRY LABORATORY
TEST PATTERN: 20-0046,U235,U238,TH232,RA226,CS137,K40
SAMPLE TYPE: 600:SOIL, SAND
TIME OF SAMPLING: 93/06/11 : DATE PRINTED:93/07/21

ANALYSIS: 20-0046 U235,U238,TH232,RA226,CS137,K40

PARAMETER	RESULT	
URANIUM-238 (TH-234)	5.8E 0 +/- 0.8E 0	PCI/G
THORIUM-232 (AC-228)	8.7E 0 +/- 1.6E 0	PCI/G
RADIUM-226 (BI-214)	1.74E 1 +/- 0.06E 1	PCI/G
POTASSIUM - 40	1.88E 1 +/- 0.12E 1	PCI/G
CESIUM-137	5.3E 0 +/- 0.5E 0	PCI/G
URANIUM-235	5.4E -1 +/- 3.2E 0	PCI/G

**** END OF REPORT ****

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JAMES HUANG
BUREAU ENVIRONMENTAL RADIATION PROTECT.
NY STATE DEPT. OF HEALTH SUBMITTED BY:HEALEY
10 UNIVERSITY PLACE
ALBANY ***INTERAGENCY MAIL***

0433 NEW YORK STATE DEPARTMENT OF HEALTH 007

WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

NBCE ID 9320835621 SAMPLE RECEIVED 93/06/16 CHARGE [illegible]

PROGRAM 177 STATE WIDE RADIATION SURVEILLANCE PROGRAM

SOURCE ID: DRAINAGE BASIN: GAZETTEER CODE:4955

POLITICAL SUBDIVISION:ROMULUS COUNTY:SENECA

LATITUDE: LONGITUDE: Z DIRECTION:

LOCATION: SENECA ARMY DEPOT ROMULUS ON SITE

DESCRIPTION:#5-E071051-BACKGROUND SAMPLE OUTSIDE OF IGLOO 710 NOT USED

DESCRIPTION:FOR RADIOACTIVE STORAGE

REPORTING LAB: 20 NUCLEAR CHEMISTRY LABORATORY

TEST PATTERN: 20-0046 U235,U238,TH232,RA226,CS137,K40

SAMPLE TYPE: 600:SOIL, SAND

TIME OF SAMPLING: 93/06/11 : DATE PRINTED:93/07/21

ANALYSES: 20-0046 U235,U238,TH232,RA226,CS137,K40

PARAMETER	RESULT
URANIUM-238 (TH-234)	8.[illegible]E -1 +/- 3.[illegible]E -1 PCI/G
THORIUM-232 (AC-228)	7.5E -1 +/- [illegible] PCI/G
RADIUM-226 (BI-214)	7.9E -1 +/- 0.8E -1 PCI/G
POTASSIUM - 40	1.77E 1 +/- 0.11E 1 PCI/G
CESIUM - 137	6.8E -1 +/- 0.5[illegible]E -1 PCI/G
URANIUM - 235	< 7.1E -2 PCI/G

**** END OF REPORT ****

COPIES SENT TO: [illegible]

JAMES HUANG
BUREAU ENVIRONMENTAL RADIATION PROTECT.
NY STATE DEP'T. HEALTH SUBMITTED BY WIGLEY
[illegible] UNIVERSITY PLACE
ALBANY ***INTERAGENCY MAIL***

TOTAL P.12

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH
LABORATORY OF INORGANIC AND NUCLEAR CHEMISTRY
EMPIRE STATE PLAZA - BOX 509
ALBANY, N.Y. 12201-0509

RECEIVED
JUL 19 1993
NEW YORK STATE DEPARTMENT OF HEALTH
BUREAU OF ENVIRONMENTAL RADIATION PROTECTION

Radiological Analysis of Wipe Samples

Samples taken at: Seneca Army Depot, Romulus N.Y.
Samples taken by: Gary Baker. Date: 6/10/93

LINC Accession No.	Field Number	Specific Location	Suspected Contaminant	dpm Gross Alpha	dpm Gross Beta
9320835624	1	324-1 Bldg 324	Ra, U	<20	<20
9320835625	2	356-1 Bldg 356		<20	<20
9320835626	3	356-2 " "		<20	<20
9320835627	4	356-3 " "		<20	<20
9320835628	5	357-1 Bldg 357		<20	<20
9320835629	6	357-2 " "		<20	<20
9320835630	7	357-3 " "		<20	<20
9320835631	8	E0804W1-Igloo E0804		77±6	48±3
9320835632	9	E0804W2-Igloo E0804		52±5	54±4
9320835633	10	E0806W1-Igloo E0806		<20	<20

Date Received: ______ Reported by: [signature] Date Reported: 7/14/93

NCL-7 (0/93)

TOTAL P.02

TOTAL P.02

USEPA Comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

DEC 29 1992

Mr. Randall W. Battaglia
Environmental Coordinator
Seneca Army Depot
Romulus, New York 14541

Re: Solid Waste Management Unit (SWMU) Classification Report

Dear Mr. Battaglia:

The following paragraphs summarize EPA recommendations for completing the draft SWMU Classification Report dated April 12, 1991, prepared by ERC Environmental Services Co. for the US Army Corps of Engineers and the Seneca Army Depot (SEAD). These recommendations were discussed with you during our site visit on September 21, 1992, arranged to resolve EPA's June 28, 1991 comments and SEAD's August 6, 1991 responses.

SEAD-1, Building 307 - Hazardous Waste Container Storage

Status: No Action

SWMU Report Upgrade: Provide the following information in Section 1.2:

1. Government agency which regulates unit and point of contact [New York State Department of Environmental Conservation (NYSDEC), RCRA Branch].
2. Regulator Permit Identification Number.
3. Construction features of SWMU and specific regulations upon which unit design was based.

SEAD-2, Building 301 - PCB Transformer Storage Facility

Status: No Action

SWMU Report Upgrade: Provide the following information in Section 2.2:

1. Government agency which regulates unit and point of contact.
2. Regulator Permit Identification Number.
3. Construction features of SWMU and specific regulations upon which unit design was based.

SEAD-4, Munitions Washout Facility Leach Field

Status: Action - SI Program

SWMU Report Upgrade: Section 4.7 - Include the recommendation for performing an SI at this area.

SEAD-5, Sewage Sludge Waste Piles

Status: Action - Sludge Removal Action followed by confirmation sampling of soils.

SWMU Report Upgrade: Section 5.7 - Provide reference to the Removal Action and Soil Sampling program proposed in SEAD's August 6, 1991 Memorandum.

EPA would like to review the draft Work Plan for performing the removal action and soil sampling, and later review the soils analytical data.

SEAD-7, Shale Pit

Status: No Action

SWMU Report Upgrade: Section 7.3.2 states that wastes are inert and do not contain chemicals that would cause contamination. Please re-evaluate whether reference to groundwater as a migration pathway is appropriate and/or provide better qualification as to the significance of this pathway.

Note - all potential migration pathways which are identified as relevant should be investigated. Therefore, if SEAD intends not to investigate a pathway for a given SWMU, they should provide qualification that the pathway is not a concern, and explain why. This comment applies to all "No Action" SWMUs.

SEAD-9, Old Scrap Wood Pile

Status: Action - SI Program

SWMU Report Upgrade: Section 9.7 - Include the recommendation for performing an SI at this area.

SEAD-10, Present Scrap Wood Pile

Status: No Action

SWMU Report Upgrade: Section 10.4 - Qualify significance of air and soil as migration pathways.

SEAD-11, Old Construction Debris Landfill

Status: Action - SI Program

SWMU Report Upgrade: Section 11.7 - Include the recommendation for performing an SI at this area.

SEAD-12, Radioactive Waste Burial Sites

Status: Action - to be determined

SWMU Report Upgrade: Section 12.6 - Recommend further study to determine if radioactive contamination exists at this AOC.

EPA would like to review SEAD's proposal for investigating this AOC.

SEAD-13, IRFNA Disposal Site

Status: Action - SI Program

SWMU Report Upgrade: Section 13.7 - Include the recommendation for performing an SI at this area.

SEAD-16, Building S-311 - Abandoned Deactivation Furnace

Status: Action - SI Program

SWMU Report Upgrade: Section 16.7 - Include the recommendation for performing an SI at this area.

SEAD-17, Building 367 - Existing Deactivation Furnace

Status: Action - SI Program

SWMU Report Upgrade: Section 17.7 - Include the recommendation for performing an SI at this area.

SEAD-18, Building 709 - Classified Document Incinerator

Status: No Action

SWMU Report Upgrade: Provide the following information:
1) Section 18.2 - types of material(s) incinerated, &
2) Section 18.3 - clarify infectious waste limited to a few medical swipes.

EPA would like to review the EP Toxicity testing results performed on incinerator ash to confirm the appropriateness of "No Action" classification.

SEAD-19, Building 801 - Classified Document Incinerator

Status: No Action

SWMU Report Upgrade: Provide the following information:
1) Section 19.2 - types of material(s) incinerated, &
2) Section 19.3 - clarify infectious waste limited to a few medical swipes.

EPA would like to review the EP Toxicity testing results performed on incinerator ash to confirm the appropriateness of "No Action" classification.

SEAD-20, Sewage Treatment Plant No. 4

Status: No Action

SWMU Report Upgrade: 1) Government agency which regulates unit and point of contact [Note - SPDES Permit is already provided],
2) Section 20.3 - Include the following statement from SEAD's August 1991 Memorandum: "Seneca does not have industrial discharges to it's sewage treatment plants", and
3) Section 20.4 - Qualify significance of surface and groundwater migration pathways.

SEAD-21, Sewage Treatment Plant No. 715

Status: No Action

SWMU Report Upgrade: Refer to SEAD-20 for recommended upgrades.

SEAD-22, Sewage Treatment Plant No. 314

Status: No Action

SWMU Report Upgrade: Refer to SEAD-20 for recommended upgrades.

SEAD-24, Abandoned Powder Burning Pit

Status: Action - SI Program

SWMU Report Upgrade: Section 24.7 - Include the recommendation for performing an SI at this area.

SEAD-25, Fire Training and Demonstration Pad

Status: Action - SI Program

SWMU Report Upgrade: Section 25.7 - Include the recommendation for performing an SI at this area.

SEAD-26, Fire Training Pit

Status: Action - SI Program

SWMU Report Upgrade: Section 26.7 - Include the recommendation for performing an SI at this area.

SEAD-27, Steam Cleaning Waste Tank

Status: Action - RCRA Closure

SWMU Report Upgrade: Section 27.2.5 - Identify government agency & Point of Contact responsible for: (1) regulating the unit's operation, and (2) supervising the closure events.

The draft Closure Work Plan, Final Closure Report and all analytical results should be sent to myself for EPA review.

SEAD-28 through 34, Underground Waste Oil Tanks

Status: No Action

SWMU Report Upgrade: Provide the following information:

1. Government agency which regulates unit and point of contact.
2. Regulator Permit Identification Number.
3. Construction features of SWMU and specific regulations upon which unit design was based.
4. Quality significance of soil and groundwater pathways.

SEAD-35 through 37, Waste Oil Burning Boilers

Status: No Action

SWMU Report Upgrade: Provide the following information:

1. Government agency which regulates unit and point of contact,
2. Regulator Permit Identification Number(s).
3. Construction features of SWMU and specific regulations which unit design was based.

SEAD-38 through 41, Boiler Blowdown Leach Pits

Status: Action - SI Program

SWMU Report Upgrade: Include the recommendation(s) for performing an SI at this area.

SEAD 42, Building 106 - Preventive Maintenance Laboratory

Status: No Action

SWMU Report Upgrade: Provide the following information in Section 42.2:

1. Government agency which regulates management of infectious wastes.
2. Regulator Permit Identification Number(s).

SEAD-43, Building 606 - Old Missile Propellant Test Laboratory

Status: Action - SI Program

SWMU Report Upgrade: Section 43.7 - Include the recommendation for performing an SI at this area.

SEAD-44, Quality Assurance Test Laboratory

Status: Action - SI Program

SWMU Report Upgrade: Section 44.7 - Include the recommendation for performing an SI at this area.

SEAD-45, Demolition Area

Status: Action - SI Program

SWMU Report Upgrade: Section 26.7 - Include the recommendation for performing an SI at this area.

SEAD-47, Buildings 321 and B06 - Radiation Calibration Source Storage

Status: No Action

SWMU Report Upgrade: Provide the following information:

1. Government agency which regulates unit and point of contact (e.g. Nuclear Regulatory Commission).
2. Regulator Permit Identification Number(s).
3. Construction features of SWMU and specific regulations upon which unit design was based.
4. Discuss likelihood of release with respect to the migration pathways identified in Section 47.7.

SEAD-48, Pitchblend Storage Bunkers

Status: No Action

SWMU Report Upgrade: Section 48.8 - Qualify the significance of the soil, groundwater, and surface water pathway.

SEAD-49, Building 356 - Columbite Ore Storage

Status: No Action

SWMU Report Upgrade: Provide the following information:

1. Government agency which regulates unit and point of contact (e.g. Nuclear Regulatory Commission).
2. Regulator Permit Identification Number(s).

3. Construction features of SWMU and specific regulations upon which unit design was based.
4. Reference study completed by Environmental Science & Engineering (ESE) which determined that ore piles do not pose an environmental threat.

SEAD-50, Tank Farm

Status: Action - To be determined.

SWMU Report Upgrade: Section 50.6 - Include recommendation for further study of this SWMU to identify and/or quantify release(s).

EPA would like to review SEAD's proposal for investigating this AOC.

SEAD-51, Herbicide Usage - Perimeter of High Security Area

Status: No Action

SWMU Report Upgrade: Provide the following information:

1. Government agency which regulates herbicide application at the SEAD facility (e.g. Federal Insecticide, Fungicide, and Rodenticide Act [FIFRA]).
2. Regulator Permit Identification Number(s).

SEAD-52, Buildings 608 and 612 - Ammunition Breakdown Area

Status: No Action

SWMU Report Upgrade: Discuss likelihood of release with respect to the migration pathways identified in Section 52.4.

SEAD-53, Munitions Storage Igloos

Status: No Action

SWMU Report Upgrade: Discuss likelihood of release with respect to the migration pathways identified in Section 53.4.

SEAD-54, Asbestos Storage

Status: No Action

SWMU Report Upgrade: 1) SWMU name should be changed to accurately reflect it's nature of operation,
2) Remove reference to asbestos storage throughout AOC description.

SEAD-55, Building 357 - Tannin Storage

Status: No Action

SWMU Report Upgrade: Section 5.5.4 - Discuss likelihood that a spill to the floor would occur, and that a release to soil or groundwater would result.

SEAD-57, Explosive Ordnance Disposal Area

Status: Action - SI Program

SWMU Report Upgrade: Section 57.7 - Include the recommendation for performing an SI at this area.

SEAD-58, Debris Area near Booster Station 2131

Status: Action - SI Program

SWMU Report Upgrade: Section 58.7 - Include the recommendation for performing an SI at this area.

SEAD-59, Fill Area West of Building 135

Status: Action - SI Program

SWMU Report Upgrade: Section 59.7 - Include the recommendation for performing an SI at this area.

SEAD-61, Building 718 - Underground Waste Oil Storage Tank

Status: No Action

SWMU Report Upgrade: Section 61.4 - Discuss likelihood that tank leakage and subsequently a release to groundwater would occur.

SEAD-63, Miscellaneous Components Burial Site

Status: Action - SI Program

SWMU Report Upgrade: Section 63.7 - Include the recommendation for performing an SI at this area.

SEAD-64, Garbage Disposal Areas

Status: Action - SI Program

SWMU Report Upgrade: Section 64.7 - Include the recommendation for performing an SI of dumping locations A, B, C, and D.

SEAD-65, Acid Storage Areas

Status: Action - pH sampling utilizing Method 9045, an electrometric procedure approved for measuring pH in calcareous and noncalcareous soils [SW-846, 3rd Edition, test Methods for Evaluating Solid Waste].

SWMU Report Upgrade: Section 65.7 should include recommendations for performing pH field testing of soils in vicinity of three areas of presumed acid storage (e.g. recommend utilizing three to four testing stations situated around each concrete pad).

EPA would like to review the results of the soil pH testing.

SEAD-66, Pesticide Storage Areas, Buildings 5 and 6

Status: Action - Soil sampling for Target Compound List pesticides. Sampling is warranted due to lack of historical record on SWMU operation and environmental persistence of pesticides introduced into the environment.

SWMU Report Upgrade: Section 66.7 should include recommendations for performing soil sampling in vicinity of each area of presumed pesticide storage (e.g. recommend utilizing three to four testing stations situated around each concrete pad and/or storage shed).

EPA would like to review the results of soil sampling.

SEAD-67, Dump Site East of Sewage Treatment Plant No. 4

Status: Action - SI Program

SWMU Report Upgrade: Section 67.7 - Include the recommendation for performing an SI at this area.

SEAD-68, Building S-335, Old Pesticide Control Shop

Status: Action - to be determined

SWMU Report Upgrade: Section 68.6 - Include recommendation for further study of this SWMU to identify and/or quantify potential release(s).

SEAD-70, Building 2110 - Landfill

Status: Action - SI Program

SWMU Report Upgrade: Include the recommendation for performing an SI at this area.

SEAD-71, Paint/Solvent Dump Area

Status: Action - SI Program

SWMU Report Upgrade: Include the recommendation for performing an SI at this area.

SEAD-72, Mixed Waste Facility

Status: No Action

SWMU Report Upgrade: Provide the following information:

1. Government agency which regulates unit and point of contact (NYSDEC RCRA).
2. Regulator Permit Identification Number(s).
3. Construction features of SWMU and specific regulations upon which unit design was based.

If you have any questions, do not hesitate to contact me at (212) 264-4595.

Sincerely yours,

Carla M. Struble, Project Manager
Federal Facilities Section

cc: G. Kittel, SEAD
M. Stahl, CEHND
K. Gupta, NYSDEC
M. Duchesneau, MAIN

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278-0012

DEC 0 3 1993

Mr. Randall Battaglia
FFA Program Manager
Directorate of Engineering & Housing
Seneca Army Depot
Romulus, New York 14541-5001

Re: SWMU Classification Update

Dear Mr. Battaglia:

This is in response to the November 15, 1993 letter to Kamal Gupta (NYSDEC) from Engineering Science, Inc. regarding the sampling program to determine whether or not various SWMUs can be classified as No-Action or whether site investigations will be required. EPA received this letter November 17, 1993. The following comments were discussed with you on November 24, 1993 and with Kevin Healy (CEHND) today.

I. REVIEW OF ES SAMPLING RECOMMENDATIONS

SEAD 38 through 41 (Boiler Blowdown Leach Pits)

Proposed work is not adequate.

ES Proposal

ES proposes to advance a single boring into the approximate center of the leach pits associated with Building 2079 (SEAD-38), Building 121 (SEAD-39), Building 319 (SEAD-40) and Building 718 (SEAD-41). The boring will be continuously sampled and screened with an organic vapor meter (OVM), followed by chemical sampling (for pH and TRPH) of the depth interval showing the highest OVM reading, the greatest degree of visible staining or a sample at the water table.

Previous EPA Recommendations

EPA recommended during our September 21, 1992 meeting at the Depot and later summarized in our December 29, 1992 letter that a Site Investigation (SI) be performed at SEAD 38 through 41 to assist in the final classification (Action versus No Action) of these SWMUs. ES' proposal does not classify as a SI and may not provide the full

array of data needed to determine the SWMUs' classification(s), for the following reasons:

1. Boiler blowdown consists primarily of minerals (metals) which have accumulated on the inner walls of the boiler as well as chemicals associated with boiler cleaning operations. SEAD states in *Appendix C to the Interim Final Report, Ground Water Contamination Survey No. 38-26-0868-88 (July 1987)* with respect to these units that "boiler blowdown water probably contains tannins, caustic soda (sodium hydroxide) and sodium phosphate.

   Given the above information, the current field screening (using an OVM) and chemical sampling (pH and TRPH) proposed by ES may not be adequate to identify potential media contamination associated with release(s) from these units. Further investigation into the chemical make-up of the blowdown appears warranted prior to determining analytical requirements.

2. The 1987 report referred to above indicates that the boilers discharged a total of 400 to 800 gallons per day (assuming three discharge events per 24 hour period). The flow drained into the ground and/or into nearby drainage ditches. The design features of the leachfield are stated to be "unknown".

   Given the lack of details regarding the size and/or features of the leach pits and the potential for secondary media to have become impacted by blowdown discharge, a preliminary conceptual model should be developed which identifies all potential migration pathways and impacted media associated with the units. This model is required to determine appropriate sampling locations.

3. We continue to recommend a SI be performed at these units.

SEAD-66 (Pesticide Storage Area Near Buildings 5 and 6)

Proposal is generally adequate.

ES Proposal

ES will collect eight surface soil samples (0-2 inches) from around the pesticide storage area. Samples will be analyzed for NYSDEC CLP pesticides.

Previous EPA Recommendations

EPA recommended (September 21, 1992 meeting and December 29, 1992 letter) that three to four testing stations be situated around each concrete pad and/or storage shed. It is not clear from Figure 66 that sampling will be performed around the perimeter of each concrete pad and/or pesticide storage area. ES should reevaluate their sampling locations to ensure that all areas potentially impacted by a pesticide spill will be sampled.

II. OUTSTANDING INFORMATION REQUESTED BY EPA TO SUPPORT THE CLASSIFICATION OF SWMUS SEAD-27, 46, 65, 68, AND 70

A brief summary of outstanding information required by EPA to ensure proper classification of these SWMUs appears below.

SEAD-27 (Steam Cleaning Waste Tank)

ERC proposed to perform a unit closure in accordance with RCRA regulatory requirements. EPA's oversight (September 21, 1992 meeting and December 29, 1992 letter) will consist of reviewing the closure plan and the closure report (and analytical data). This information will be used to determine the classification of this unit and/or the need for further investigation.

EPA has yet to receive the Closure Work Plan for this unit, therefore, this remains an outstanding issue.

SEAD-46 (Small Arms Range)

ERC recommended soil sampling be performed prior to recommending a classification for this unit. EPA agrees (June 28, 1991 letter) with the requirement for sampling at this unit.

EPA has yet to receive the Sampling and Analysis Plan for this unit, therefore, this remains an outstanding issue.

SEAD-65 (Acid Storage Areas)

EPA recommended (June 28, 1991 letter, September 21, 1992 meeting, and December 29, 1992 letter) that pH sampling utilizing Method 9045 be performed in the vicinity of the three areas of presumed acid storage to identify potential environmental impacts resulting from release of acid liquids from this unit (we recommended using three to four testing stations around each concrete pad).

EPA has yet to receive the Sampling Plan for this unit, therefore, this remains an outstanding issue.

SEAD-68 (Old Pesticide Control Shop)

EPA had requested (June 28, 1991 letter, September 21, 1992 meeting, and December 29, 1992 letter) that ERC provide sampling recommendations for this unit to provide data to support classification of this SWMU.

EPA has yet to receive the Sampling and Analysis Plan for this unit, therefore, this remains an outstanding issue.

The issues discussed in this letter must be resolved before the SWMU Classification Report can be finalized. If you have any questions, please call me at (212) 264-4595.

Sincerely yours,

Carla M. Struble, P.E.
Federal Facilities Section

cc: K. Gupta, NYSDEC
K. Healy, CEHD
R. Suever, CEHD
M. Duchesneau, ES

APPENDIX K

APPENDIX K

References

REFERENCES

1. Federal Facility Agreement under CERCLA Section 120, U.S. Environmental Protection Agency Region II, U.S. Department of the Army, and the New York State Department of Environmental Conservation.

2. Section 3004 (u) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. 6924 (u).

3. Evaluation of Solid Waste Management Units, Seneca Army Depot, Interim Final Report, Groundwater Contamination Survey No. 38-26-0868-88, U.S. Army Environmental Agency, July, 1987.

4. Draft Resource Conservation and Recovery Act Part B Permit Application Seneca Army Depot, Romulus, NY, prepared for U.S. Army Corps of Engineers, Huntsville Division, by EBASCO, March, 1990.

5. Draft RCRA Facility Assessment Report, Seneca Army Depot, NYS, Department of Environmental Conservation, August 1988.

6. Update of the Initial Installation Assessment of Seneca Army Depot, NY, USATHAMA Report No. AMXTH-IR-A-157(U), Environmental Science and Engineering, Inc., August 1988.

7. EPA's Polychlorinated Biphenyls Spill Cleanup Policy; Final Rule, 40 CFR Part 761, April 2, 1987.

8. Installation Assessment of Seneca Army Depot, Report No. 157, U.S. Army Toxic and Hazardous Materials Agency, January 1980.

9. Seneca Army Depot, Burning Pit/Landfill Site Investigation, Draft Final Report, USATHAMA Report No. CETHA-IR-CR-88160, ICF Technology, Inc., July, 1989.

10. New York State Solid Waste Regulations, Subpart 360-7, Construction and Demolition Debris Landfills.

11. Memorandum, Department of the Army, Seneca Army Depot, SDSSE-LS, December 6, 1988, Subject: Radiological Decontamination Report.

12. Memorandum, Department of the Army, Seneca Army Depot, SDSSE-LS, December 6, 1988, Subject: Radiological Decontamination Report.

13. Letter, U.S. Army Environmental Health Laboratory, MEDEI-E, August 16, 1960, Subject: Disposal of IRFNA by Soil Absorption, Seneca Ordnance Depot (transmittal letter for Report of Sanitary Engineering Study No. 3642E4-60).

14. Criteria Development Report for Closure of Nine Burning Pads, Seneca Army Depot, Romulus, New York, Volumes I and II, Contract No. DACW41-86-D-0112, Delivery Order 23, Metcalf and Eddy, October, 1989.

REFERENCES (Con't)

15. Investigation and Evaluation of Underground Storage Tanks, Seneca, AD, Romulus, New York, prepared for U.S. Army Corps of Engineers, Huntsville Division, by U.S. Army Corps of Engineers, Omaha District, September, 1989.

16. New York State Law, Regulation 6 N.Y.C.R.R., Part 613.5 (A)(2)(i).

17. Dangerous Properties of Industrial Materials, 7 edit, N. Irving Sax and Richard J. Lewis, Sr., 1989.

18. Letter, United States Nuclear Regulatory Commission, Region I, May 2, 1988, Subject: Closeout Inspection No. 8-002, Bunkers EO801-EO811, October 29, 1987.

19. Letter, USAEHA, HSHB-RP-MO, October 27, 1983, Subject: Pesticide Monitoring Special Study No. 17-44-0987-84, Analysis of Environmental Samples for Herbicide Content, Seneca Army Depot, NY, September 12, 1983.

20. Memorandum, USAMC Installations and Services Activity, AMXEN-U, March 5, 1990, Subject: Installation Pest Management Plan (IPMP) for Seneca Army Depot.

21. RCRA Facility Assessment Guidance, U.S. Environmental Protection, Office of Solid Waste, October, 1986.

22. Interim Final RCRA Facility Investigation (RFI) Guidance, Volumes I and II, U.S. Environmental Protection Agency, PB89-200299, May, 1989.

23. Draft Remedial Investigation Report at the Ash Landfill site, Appendices Volumes I and II, Engineering-Science, Inc., October, 1993.

24. Draft Remedial Investigation Report at the Open Burning (OB) Grounds, Appendices Volumes I and II, Engineering-Science, Inc., October, 1993.

25. Structures, A1 and A2, Plan, Elevations and Sections, Building 803, Ordnance Storage Area, Seneca Ordnance Depot, NY, Black and Veatch Consulting Engineers, May 2, 1955.

26. Structures A1 and A2, Sections and Details, Building 803, Ordnance Storage Area, Seneca Ordnance Depot, NY, Black and Veatch Consulting Engineers, May 2, 1955.

27. Structures A1 and A2, Lighting and Wiring, Building 803, Ordnance Storage Area Seneca Ordnance Depot, NY, Black and Veatch Consulting Engineers, May 2, 1955.

28. Structures A1 and A2, Reinforcing Details, Building 803, Ordnance Storage Area, Seneca Ordnance Depot, NY, Black and Veatch Consulting Engineers, May 2, 1955.

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42. Composition and Property of OB/OD Materials, Table D-11, No date.

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