

## ENVIRONMENTAL RESTORATION ACTIVITIES AT THE U.S. DEPARTMENT OF ENERGY'S PINELLAS PLANT

Michael Wm. Parker, Specialist  
Environmental Protection  
GE - Neutron Devices\*

### ABSTRACT

The Pinellas Plant, located in Largo, Florida, is part of the U.S. Department of Energy's (DOE) weapons complex. GE Neutron Devices (GEND) has initiated an extremely aggressive, proactive Environmental Restoration (ER) Program at the Pinellas Plant. The ER program was started by AL to investigate environmental concerns associated with past waste management practices and procedures at DOE weapons installations.

The Pinellas Plant has been involved with ER activities since the mid 1980's when the DOE's Pinellas Area Office (PAO) entered a voluntary cleanup agreement with the Florida Department of Environmental Regulation (FDER). The agreement was for the remediation of an adjacent parcel of property previously owned, and used for disposal of drums containing waste solvents and resins. The ER program at the Pinellas Plant has been progressing rapidly since this inception, with ER activities currently initiated and/or planned at all sites where contaminants have been detected above regulatory standards. These activities operate under the State of Florida's "Corrective Actions For Ground Water Contamination Cases" guidance and the Environmental Protection Agency's (EPA) Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments (HSWA) Corrective Action Rule and the requirements specified in the Hazardous Waste Part B Permit.

Remediation issues at the Pinellas Plant are equivalent to those experienced by many private industries; for example, limited volatile organic compound (VOC) and heavy metal contamination of the surficial aquifer system and heavy metal contamination of soils. ER activities in progress are aimed toward; confining, repositioning and remedying areas of heavy metal and VOC contaminants found within the surficial aquifer system; consistency with EPA's draft Corrective Action Rules which state "the corrective action program will be to expedite cleanup results by requiring (taking) sensible early action to control environmental problems"; protection of a U. S. Department of Interior (DOI) designated national wetland; and to ensure that risk to human health and safety and to the environment posed by the plants past, present and future operations are either eliminated or reduced to acceptable, safe levels.

This paper will summarize the progress made and the strategies of the Pinellas Plant ER program as well as implementation of interim remedial actions.

### FACILITY OVERVIEW

The Pinellas Plant is owned by the U. S. Department of Energy (DOE) and is currently operated by GE Neutron Devices (GEND) as the prime management and operating (M&O) contractor. The contract is administered by the DOE Field Office, Albuquerque (AL) through the Pinellas Area Office (PAO). Construction of the Pinellas Plant commenced in 1956, with production operations beginning in 1957. The Pinellas Plant is an essential part of the nation's nuclear weapons complex.

The Pinellas Plant is located in Pinellas County, Florida on a 99-acre parcel of property (Fig. 1). Pinellas County is situated along the west central coastline of Florida on a peninsula that separates Tampa Bay from the Gulf of Mexico. The City of Tampa is located approximately 30 miles east of the plant, while St. Petersburg is about six miles to the south east. The plant is located midway between the cities of Largo and Pinellas Park and is centrally located within the county. The Plant is bordered on the East by Belcher Road (County Road 27), on the South by Bryan Dairy Road (County Road 135), on the West by the CSX railroad tracks and to the North by industrial lots, some of which are vacant (1).

Originally constructed in an isolated area, the plant site today resides in the highest and most densely populated county in Florida with light industry and residential areas in the immediate vicinity. Approximately 35 percent of the plant site is occupied by structures and paved areas, the remaining 65 percent is open space (Fig. 2). Pinellas Plant Layout). Natural surface waters do not exist on the Pinellas Plant property; however, included in the open space are two man-made ponds (the East and West ponds) which have been designated as national wetlands by the U.S. Department of the Interior, Fish and Wildlife Service National Wetlands Inventory (2). In addition to the two man-made ponds, there is a stormwater retention basin (the South Pond) designated to collect runoff from a half-inch rainfall event. The three ponds have a combined surface area of approximately 2 hectares (5 acres).

The Pinellas Plant was originally built to manufacture neutron generators, a principal component in nuclear weapons. Over the years the mission of the plant expanded to include the small-volume production of select high technology nuclear weapon components which require strict control of materials and processes in an ultra-clean environment.

\* GE Neutron Devices operates the Pinellas Plant for the U.S. Department of Energy under contract No. DE-AC04-76DP00656.

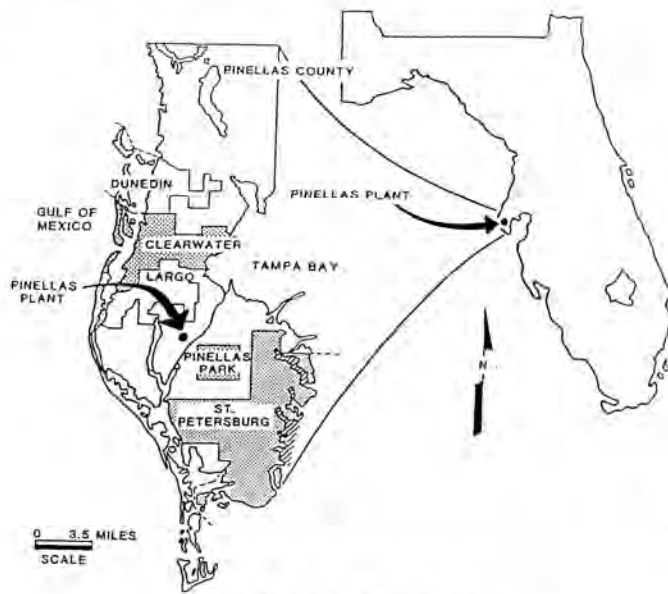


Fig. 1. Pinellas Plant location.

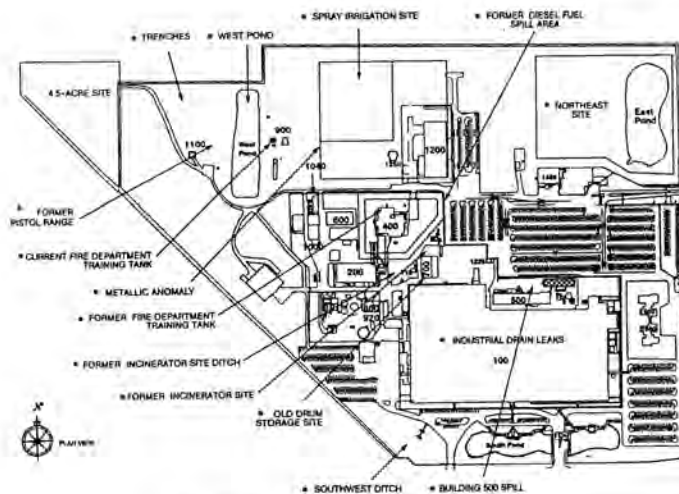


Fig. 2. Pinellas Plant site layout.

Production of these devices necessitated the development of several uniquely specialized areas of competence and supporting facilities. The existence of these capabilities has led to the assignment of other weapon application products.

In addition to the manufacturing facility, a production development capability is maintained at the facility. The plant's products have included: neutron generators and detectors, vacuum switch tubes, electromagnetic devices, thermal batteries, radioisotopically-powered thermoelectric generators, frequency control devices, quartz digital accelerometers, lightning arrestor connectors, ceramics and foam support pads.

The manufacturing operations at the Pinellas Plant fall into the Metal Finishing category as defined by the U.S. Environmental Protection Agency (EPA). A list of production and testing processes at the plant include: electroplating, electroless plating, encapsulation, etching and chemical cleaning, machining, grinding, burnishing, impact deforma-

tion, shearing, thermal cutting, welding brazing, soldering, flame spraying, sand blasting, solvent degreasing, painting, calibration and testing. This work involves handling of relatively small volumes of hazardous substances. During calendar year 1990, the radioisotopically-powered thermoelectric generator (RTG) product line was discontinued with RTG production equipment and all plutonium being removed from the site in early 1991. During RTG production all plutonium entering, residing and leaving the site was triple encapsulated.

The Pinellas Plant has been operated since its inception in 1956 by the DOE and its predecessor agency, the Atomic Energy Commission for the production of nuclear weapon components for national defense programs. Low-level radioactive, hazardous and other waste has been disposed of in, or discharged to, the air, soil and water at the site due to past waste management practices which were industry standard at the time. Limited, isolated areas of groundwater and soils underlying the site have resulted in releases of contaminants to the environment from these past practices.

### REGULATORY FRAMEWORK

Prior to the enactment of current environmental regulations, DOE, its predecessor, and its contractors were guided by internal standards and the Atomic Energy Act of 1954 with respect to environmental practices, pollution and radiation control (2). Presently, DOE and its operating contractors are guided by the existing applicable state, federal and local laws and regulations as well as DOE orders. Figure 3 depicts an outline of the relationship between the various regulatory agencies and operations at the Pinellas Plant. The regulatory framework guiding environmental restoration activities at Pinellas fall under the auspices of either the EPA, the Florida Department of Environmental Regulation (FDER), Pinellas County government and the DOE. Some specific laws which direct the Environmental Restoration Program at the Pinellas Plant are discussed below.

### Comprehensive Environmental Response, Compensation and Liability Act

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as amended, is implemented by EPA under 40 Code of Federal Regulation

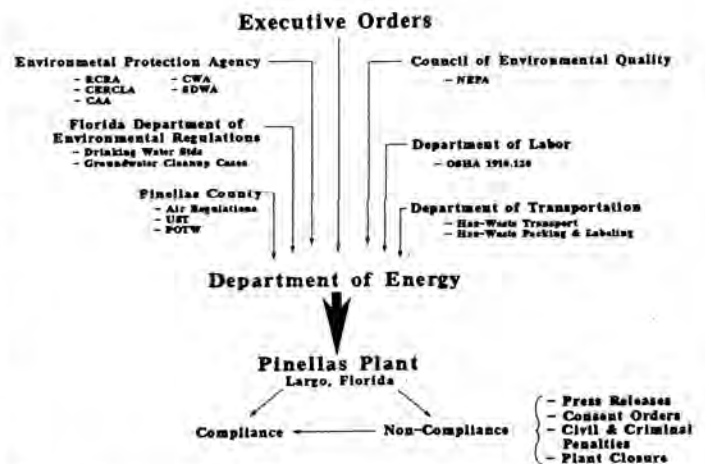


Fig. 3. Environmental rules, regulations and policies applicable to Pinellas Plant.

(CFR) part 300 as amended by "Superfund". Current CERCLA regulations address inactive waste sites from the stand point of release of hazardous substances. Sites are given a numerical Hazard Ranking System (HRS) score based on various site and waste characteristics. Changes in CERCLA regulations to permit inclusion of federal sites on the National Priority List (NPL) were effective February 18, 1986 (2). The Pinellas Plant is currently involved in the assessment and remediation of two CERCLA sites. The Peak Oil site, a privately owned facility located in Tampa, Florida, was used as an oil reclamation facility and has been placed on the NPL by the EPA and is currently ranked 55. The Pinellas Plant has been identified as one of many Potentially Responsible Parties (PRP) for this site and is participating in the cleanup through a PRP steering committee. Currently, the Peak Oil site is in the Remedial Investigation / Feasibility Study (RI/FS) stage of CERCLA cleanup.

The Pinellas Plant is also involved in assessment and remediation activities on an adjacent parcel of property previously owned by the plant. This parcel, known as the 4.5 Acre Site was used as a waste disposal site for spent solvents contained in 55-gallon drums. The property was sold to a private individual in 1972. The site was scored under HRS; however, the score did not warrant inclusion on the NPL. Therefore activities are being conducted voluntarily by the Pinellas Plant under a mutual agreement with the FDER.

#### Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) defines solid and hazardous waste and regulates its storage, handling, transport and disposal. RCRA Reauthorization, signed by President Reagan on November 9, 1984, contains the Hazardous and Solid Waste Amendments (HSWA) that substantially expanded, among other issues, corrective action authorities for both permitted RCRA facilities and facilities operating under interim status. Section 3004(u) of HSWA requires that any permit issued under Section 3005(c) of RCRA to a treatment, storage or disposal facility after November 8, 1984, address corrective action for releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU) at the facility (2).

Under RCRA, federal facilities are required to prepare RCRA Part A and B applications that describe in detail how their hazardous waste is managed. Section 3006 of RCRA authorizes states to develop and enforce their own hazardous waste programs in place of the federal program administered by the EPA. Florida obtained final authorization under the original RCRA provisions (i.e., pre-HSWA) from the EPA on February 12, 1985; however, Florida has not received administrative authorization for any of the provisions of the 1984 amendments. Therefore the Pinellas Plant's Part B permit consists of an FDER Operating Permit for active hazardous waste management activities and EPA issued a HSWA permit for SWMUs and other HSWA provisions, in essence a "dual" Part B permit. Thus, the HSWA portion of the Pinellas Plant's RCRA Part B Permit, issued February 9, 1990, is the governing force for assessing and remedying on-site SWMUs.

#### Clean Air Act

Florida has essentially full permitting authority for the Clean Air Act (CAA) except for some aspects of "Prevention of Significant Deterioration" regulations. Pinellas County ad-

ministers the CAA under agreement with the state, but the actual permitting authority still resides with the FDER. The National Emission Standards for Hazardous Air Pollutants (NESHAPS) establishes emission standards for substances designated as hazardous air pollutants. Substances designated as hazardous air pollutants under NESHAPS are included in the CERCLA list of hazardous substances for which reportable quantities are established. The CAA is applicable to the Pinellas ER program through various remediation technologies which may impact air quality.

#### Clean Water Act

National Pollutant Discharge Elimination System (NPDES) requirements outlined within the Clean Water Act (CWA) are designated to regulate hazardous aqueous pollutant discharges by issuing permits for outfalls. Those materials designated as hazardous substances under the CWA have been incorporated into a larger set of hazardous substances outlined under CERCLA (2). Reportable quantities (RQs) of hazardous substances under CERCLA are consistent with the RQs established under the CWA. Florida has not been delegated NPDES authority. Consequently direct surface water discharges are permitted through EPA. Under agreement with the EPA, the state does oversee pretreatment requirements and regulates industrial discharge to publicly owned treatment works (POTWs) through a variety of state (FDER) and local (county and municipal) permitting actions. The Pinellas Plant currently does not have a NPDES permit because all industrial and sanitary effluents are discharged through the sanitary sewer system to a publicly owned treatment works (POTW). Under NPDES regulations, stormwater discharges will soon require NPDES permitting. The Pinellas Plant is currently preparing a NPDES permit application for stormwater discharges from the three on-site ponds. The impact of this permitting effort on ER activities are unknown at this time. All wastewaters associated with or generated by ER activities are currently discharged in accordance with POTW permitting requirements via the plant's wastewater discharge subsequent to proper pretreatment.

#### National Environmental Policy Act

The National Environmental Policy Act (NEPA) regulatory process is initiated by preparation of an Environmental Checklist and unless Categorical Excluded, conclude with NEPA documentation. NEPA documentation may be in the form of an Environmental Assessment/Finding of No Significant Impact or an Environmental Impact Statement/Record of Decision. The Pinellas Plant reviews all ER projects for NEPA compliance and prepares reports for subsequent processing and action by DOE.

Maintaining compliance with the regulatory drivers stated above (as well as others not stated) is an achievement in and of its self. The ramifications of noncompliance can be monumental both financially and in the area of public relations. The issue of noncompliance can result in a multitude of negative circumstances ranging from press releases to liabilities in the form of civil and criminal penalties to facility closure, not to mention the potential for an accident and/or injury to personnel or the environment.

### ER PROGRESS AND CURRENT STATUS

The ER program at the Pinellas Plant was initiated in mid-1984 in response to the DOE Field Office, Albuquerque's Comprehensive Environmental Assessment and Response Program (CEARP) and has rapidly advanced to its current state. Figure 4 outlines the advances made at the plant since the program was initiated by the DOE Albuquerque Operations Office. The program's major emphasis was to determine if waste management practices followed in the past had resulted in environmental issues and whether corrective actions were needed. CEARP also assisted DOE in setting environmental priorities and provided justification for funding to carry out enhancements to existing programs or remedial actions if required. This program was initiated to help fulfill DOE's commitment to have all of its facilities operate under a policy of full compliance with applicable environmental regulations while conducting their missions (2). Through records searches, open literature surveys, interviews with employees, preliminary assessments and site inspections, CEARP identified 14 potential sites for further investigation.

#### Pinellas Plant ER Program Progress

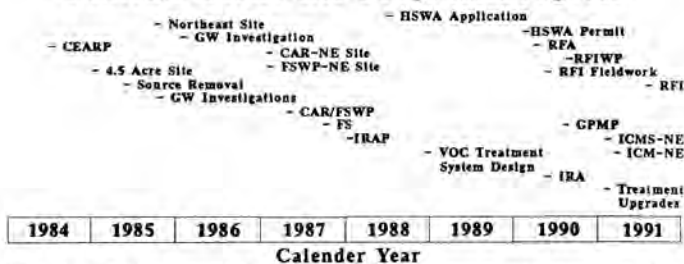


Fig. 4. Environmental restoration program progress at the Pinellas Plant.

Of those sites identified, the resin drum disposal area (or the 4.5 Acre Site) was identified as the highest priority site. Drums filled with resin and solvent waste from plant operations were disposed of in the triangular area northwest of the present site boundary in the early 1960s. Disposal consisted of excavation, placement of drums, and backfilling. The land was subsequently sold to a private individual in 1972 (1). Confirmation of these activities occurred in 1985 when the U.S. Geologic Survey was commissioned to perform an electromagnetic survey of this area to ascertain if drums were present. During revegetation activities at the site, the top was knocked off of one drum that was buried at the immediate surface. The contents were determined to be methylene chloride. Subsequently, a detailed, voluntary assessment and source removal activity authorized by the Florida Department of Environmental Regulation commenced. A total of 83 drums were exhumed and about 303 tons of contaminated waste and soils were disposed of at the Pinewood, South Carolina hazardous waste landfill (2).

After the source material was removed, a series of studies to identify the areal extent of groundwater contamination resulting from drum leakage was conducted. The Pinellas Plant followed all FDER activity and reporting requirements for ground water cleanup cases. These activities were initiated and/or considered completed upon FDER written approval even though no consent order or other formal compliance agreement was signed. The Contamination Assessment Report and Feasibility Work Plan were submitted to the FDER

in August 1986 and approved in March 1987. The Feasibility Study report was submitted and approved in October of 1987. During the Feasibility Study it was determined that Interim Remedial Action was warranted due to the off-site migration of contaminated groundwater. An Interim Remedial Action Plan was submitted and approved in May 1988 and design and construction of the Interim Remedial Action and Volatile Organic Compound Treatment System was completed in May 1990.

During 1991, ER activities relating to the 4.5 Acre Site included (3):

- Upgrades to the treatment system to reduce maintenance downtime;
- Extensive monitoring to evaluate the effectiveness of the Interim Remedial Action recovery and treatment system;
- Design and construction of a pretreatment system for removal of naturally occurring high levels of iron from recovered groundwater, (resulting in improved treatment efficiencies and reduced system downtime); and
- Re-assessment activities to determine whether residual contaminants remain in the soils, to evaluate the effectiveness and placement of recovery wells, and to provide data for development of a final remedial action plan.

As of December 31, 1991, 19 months of Interim Remedial Action were completed. Approximately 6 million gallons of groundwater has been recovered and treated. Greater than 99% removal efficiency is routinely achieved. Contaminant levels have dropped significantly (85-100%) in a majority of on-site and off-site monitoring wells. The results from a soil gas survey indicate no residual contaminants exist in the vadose (or unsaturated soil) zone.

While ER activities were being conducted at the 4.5 Acre Site other on-site activities were being conducted to evaluate other miscellaneous sites on Pinellas Plant property. A majority of this work focused on the Northeast site, a former waste drum staging area. A Contamination Assessment Report (CAR) was developed and submitted to the FDER for approval. FDER approval was granted in October 1987. The Feasibility Study (FS) was initiated and completed; however, subsequent to FDER submittal, EPA exercised jurisdiction over the miscellaneous sites under HSWA authority. Thus effectively delaying progress in the Pinellas Plant ER program due to required reinvestigation of this site. Prior to issuance of the HSWA permit in February 1990 (4) development of the RCRA Facility Investigation Work Plan (RFIWP) was initiated.

It was, and is, the Pinellas Plant ER strategy to initiate and complete as much documentation development and field work as practical while the regulatory agency is in the process of reviewing the submitted documentation. For example, document development of the Corrective Measures Study Work Plan (CMSWP) has been initiated even though final EPA approval of the RCRA Facility Investigation (RFI) has not been granted. This strategy is one factor that accounts for the quick progression of the Pinellas Plant ER Program despite setbacks which resulted from regulatory lead agency changes. It must be noted that this approach does involve a level of risk. The RFI Work Plan was submitted to the EPA in May 1990

with subsequent approval in April 1991 (5). Conforming to this strategy, site investigation field work and documentation was initiated prior to the RFI Work Plan approval. Assessment field work was completed in early 1991 with the RFI Report generation and EPA submittal in September 1991 (5). Had EPA required substantial rework of the RFI Work Plan, all field work conducted to date would have been invalidated.

During 1991, development of proposed accelerated remediation of the Northeast Site, one of the EPA identified HSWA solid waste management units (SWMUs) was initiated. This accelerated remediation was warranted by the previous findings indicated in:

- The Northeast Contamination Assessment Report;
- On-going routine groundwater sampling conducted under DOE Order 5400.1, General Environmental Protection Programs, Chapter III 4.a, the Groundwater Protection Management Program (GPMP) Plan; and
- Preliminary findings of the RCRA Facility Investigation fieldwork.

A report titled "Interim Corrective Measures Study, Northeast Site" was developed in May 1991 and approved by EPA Region IV in September 1991. The appropriate NEPA documentation, in accordance with DOE Order 5440.1D, was completed concurrently and DOE Headquarters approval was received in November 1991.

Subsequent to EPA and DOE approvals, initiation and completion of construction activities associated with the interim action were completed. Interim Corrective Measures of the Northeast Site consist of four recovery wells which pump to a Northeast Site transfer system. Groundwater is then routed to the existing VOC treatment system at the 4.5 Acre Site. Utilization of excess capacity at the 4.5 Acre Site VOC treatment system allowed for expeditious implementation of interim action at the Northeast Site and in extensive cost savings through consolidation of remediation projects. Thus, a reduction in potential adverse public and environmental health impact due to possible contaminant migration to adjacent properties was avoided.

The implementation of interim corrective measures at the Northeast Site is consistent with EPA's goals for RCRA Corrective Actions. In EPA's draft Corrective Action Rules (Subpart S), the agency states, "One of the agency's overriding goals in managing the corrective action program will be to expedite cleanup results by requiring (taking) sensible early actions to control environmental problems on an interim basis" (6). This action is also consistent with Secretary of Energy Watkins' commitment to the environment-- addressing environmental issues in an efficient and thorough, yet cost-effective manner.

The Pinellas Plant ER strategy is to progress as rapidly and cost-effectively as necessary while maintaining full regu-

latory compliance. Many factors govern this progression, with primary factors being dedicated personnel with required expertise and the formation of a close working relationship between all parties involved (ie. assessment, remediation, regulatory and DOE).

## CONCLUSION

The Pinellas Plant has been involved with ER activities since the mid-1980s when the DOE's Pinellas Area Office entered a voluntary cleanup agreement with the Florida Department of Environmental Regulation to remediate the 4.5 Acre Site. The ER program at the Pinellas Plant has progressed rapidly since this inception with the implementation of many ER activities; such as the voluntary cleanup at the 4.5 Acre Site, the implementation of interim corrective measures at the Northeast Site, and planned activities at all sites where contaminants have been detected above regulatory standards. This rapid progression conforms to the intent stated in EPA's Draft Corrective Action Rule (Subpart S) and the DOE's commitment to addressing environmental issues in an efficient and thorough and cost-effective manner. The U.S. Department of Energy's Pinellas Plant operates under a policy of full compliance with all applicable environmental regulations while conducting their mission. It is the position of all ER personnel involved that neither value need be compromised.

## REFERENCES

1. GE, 1991a, "Pinellas Plant Site Environmental Report For Calendar Year 1990", Environmental Health and Safety Programs, August 1991.
2. DOE, 1987, "Phase 1: Installation Assessment Pinellas Plant [DRAFT], Comprehensive Environmental Assessment and Response Program," U.S. DOE Albuquerque Operations Office, Albuquerque, New Mexico, December 1987.
3. GE, 1991b, "Pinellas Plant Environmental Protection Implementation Plan", Environmental Health and Safety Programs, October 1991.
4. EPA, 1990, "RCRA Hazardous and Solid Waste Amendments Permit, U.S. DOE Pinellas Plant, Largo, Florida", (EPA ID No. FL6-890-090-008), February 9, 1990.
5. DOE, 1991, "Draft RCRA Facility Investigation Report, Pinellas Plant", Environmental Restoration Program, U.S. DOE Field Office, Albuquerque, New Mexico, September 1991.
6. EPA, 1990, Federal Register / Volume 55, Number 145 / Friday July 27, 1990, Proposed Rule, "Corrective Action For Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities, July 27, 1990.