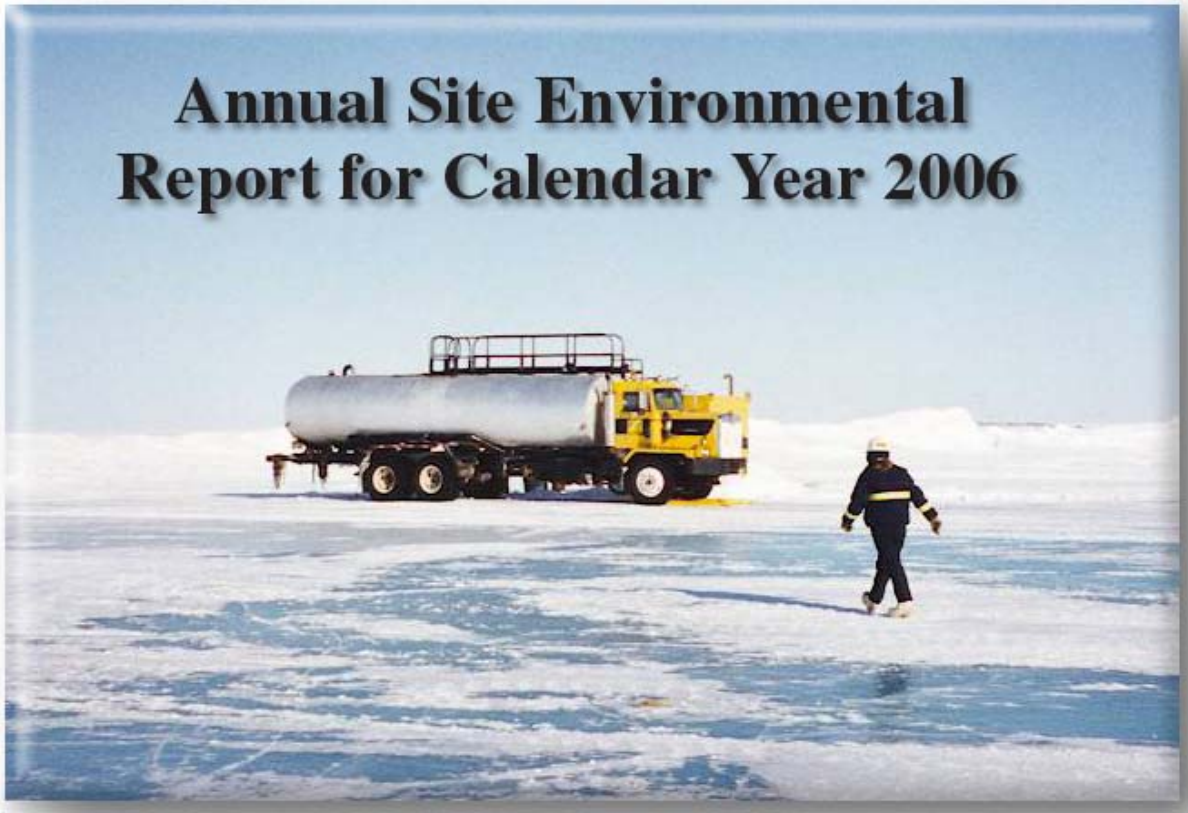
U.S. Department of Energy • Office of Fossil Energy

National Energy Technology Laboratory

Annual Site Environmental Report for Calendar Year 2006



2006 Annual Site Environmental Report

October 2007

U.S. Department of Energy
National Energy Technology Laboratory
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2006 NETL ANNUAL SITE ENVIRONMENTAL REPORT

1.0 EXECUTIVE SUMMARY

2006 was a very successful year for the NETL environmental program. The Albany, Morgantown, and Pittsburgh operations all maintained ISO 14001 certification throughout the year, and substantial progress was made assuring that the Albany site becomes fully integrated into the NETL environmental family. There were no environmental violations cited during the year, and the comprehensive and thorough approach to environmental compliance implemented at NETL uncovered no issues of non-compliance.

In 2006, NETL resolved a concern made by an independent auditor in 2005 that NETL was unable to document compliance with the shortened, but never-the-less extensive, list of environmental requirements that apply to NETL activities. This has been an on-going problem that traces back to the *DOE Necessary and Sufficient Instructions* issued in September 1994, allowing DOE operations to determine which environmental requirements were required to be implemented at each site. In April 1996 this process of standards identification was officially changed to the *Work Smart Standards.* In 1997, upon the merger of the Pittsburgh and Morgantown sites into a single operation, a shortened list of requirements specifically applicable to NETL operations was developed. This list was named the *Focused Standards List* to distinguish it from other less specific standard lists. In 2006 this list identified over 430 distinct standards applicable to the NETL ES&H program, all of which are being implemented through the NETL Directives Process.

NETL conducted more than 1,800 onsite and contracted activities in the United States and in more than 40 foreign countries in 2006. Some of the most important programs NETL implements are FutureGen, the Clean Coal Power Initiative, the Methane Hydrate Research and Development Program, and the Modern Grid Initiative. NETL won a 2006 Fossil Energy Environment, Safety, Security and Health Award for innovative HAZMAT team training methods. This award was based on how NETL maintains processes to respond to accidents and emergency situations and for preventing or mitigating the environmental impacts that may occur.

The Morgantown and Pittsburgh sites, as a single entity, were recertified in 2006 to ISO 14001 by NSF-International Strategic Registrations, Inc. The Albany site was recertified by Orion Registrar, Inc.. To maintain certification, surveillance audits are conducted every 6 months at Morgantown and Pittsburgh, and every 12 months at Albany, to measure continual improvement to the EMS and adherence to the ISO 14001 standard. The NETL EMS assures consideration of environmental impacts of day-to-day activities and minimizes these impacts

as much as possible, consistent with the NETL mission of fossil energy research and development (R&D).

NETL was in full compliance with all environmental statutes and regulations throughout 2006. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those statutes included CERCLA, SARA, RCRA, CAA, CWA, AEA, NEPA, and TSCA. Each of these statutes are described in detail below.

NETL filed three occurrence reports into the DOE Occurrence Reporting and Processing System (ORPS). One report resulted from a potable water line break at Pittsburgh, causing potable water to percolate to the surface. This ultimately released turbid water into the nearby waterway. The two other ORPS reports addressed safety concerns that did not involve any significant harm, but were reported because there was a potential for the incident to be repeated and/or the potential existed for the injury to have been significantly more severe. One of those occurrences was reported when a diamond plate covering outside stairs at the Morgantown site broke loose from the stairs as an employee was descending them, causing the employee to fall down several steps. The other occurrence, also at Morgantown, was reported when it was discovered that an employee had failed to properly lock out a high pressure nitrogen line prior to performing work on the line.

Stage I construction activities of the Technology Support Facility (TSF) at the Morgantown site continued during 2006. Site excavation, foundation, and foundation wall construction were completed. Installation of structural steel, windows, a stone façade, a build-out of the penthouse roof, and the roofing system was initiated, with completion of this phase expected to be accomplished in early FY 2007.

The Morgantown site provides chemical inventory reports (Tier 2 Reports) to the Monongalia County Local Emergency Planning Committee and the Morgantown Fire Department. Hydrogen sulfide (1700 pounds daily average) is the only chemical present at the Morgantown site in excess of the threshold planning quantity, as defined by SARA Title III. Hydrogen sulfide is stored as a compressed gas in metal cylinders. Other materials that are reported are carbon dioxide (average daily amount stored is approximately 3600 pounds (1800 pounds daily average) and nitrogen (average daily amount stored is approximately 7922 pounds (59,386 pounds daily average)). Nitrogen is stored outdoors in an above-ground storage tank and in individual gas cylinders. The Morgantown site does not generate a toxic release inventory (TRI) because the site does not release any of the listed toxic materials in quantities that exceed the TRI threshold amounts. During 2006, there were no releases that would trigger emergency notification as required by either EPCRA or CERCLA.

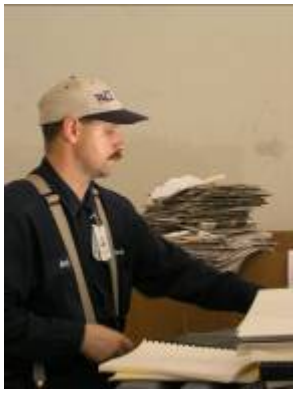
During 2006, the Morgantown hazardous waste management inspections continued to focus on proper control of hazardous materials within lab spaces. Any deficiencies were entered into the AIIS tracking system and appropriate actions taken to correct these findings. On

October 30, 2006, the WVDEP Division of Water & Waste Management conducted a surprise inspection. No areas of non-compliance were found. The recycling program as implemented in Morgantown consists of utilizing a site support services contractor (PACE Industries) for pickup and packaging of the recyclables. The offsite recycling vendor removes the recyclables from a central location and disposes of them via local recycling outlets.

NETL conducted NEPA reviews for both on-site actions and off-site actions proposed for funding by the federal government. These include actions planned in cooperation with other governmental organizations, educational institutions, and private industry.

NETL reduced consumption of petroleum products primarily through the use of ethanol and natural gas in alternative-fueled vehicles. DOE defines petroleum products as oil, gasoline, diesel fuel, LPG, and propane. NETL does not typically use petroleum products for heating buildings. Only forklifts, front-end loaders, snow-removal equipment and lawn care equipment use petroleum products, which are primarily fueled with gasoline and diesel fuel. Alternate fuel systems have been installed at both Morgantown and Pittsburgh. These alternative fuel systems include Ethanol 85 and Compressed Natural Gas (CNG) vehicle refueling stations. The Ethanol 85 refueling stations are operating at both Morgantown and Pittsburgh. The CNG facility at Pittsburgh is operating, while the Morgantown CNG facility remains under construction. The Ethanol 85 and CNG facilities are helping NETL meet the alternate fueled vehicle goals as defined in *E.O. 13223*.

Pittsburgh had been experiencing increasing problems with the potable water supply lines that supply all of the potable water for the R&D plateau operations. Problems with this 20-year old system included unpredictable pipe ruptures and inoperable shutoff valves. On several occasions line ruptures caused turbid water to be released into nearby Lick Run, creating an environmental incident. In addition, disruption of the water supply impeded the effective performance of site activities. In 2006, eighty percent of these water lines were replaced and new isolation valves were installed so that future environmental releases from broken water lines will not occur.



Pittsburgh does not prepare a TRI (Form R) because the site does not use, produce, or process any of the listed toxic materials in quantities that exceed the threshold amounts. During 2006, there were no releases that would trigger emergency notification as required by the Emergency Planning and Community Right-To-Know Act, EPCRA, or CERCLA.

EO 13149 established a policy to ensure that the Federal Government exercises leadership in the reduction of petroleum (gasoline and diesel) consumption. In the final year of this executive order, NETL achieved a 10% reduction in petroleum fuel used in 2006, compared to 1999 levels, and 51% of total fuel consumption was used in Alternative Fuel Vehicles (AFV).

Albany does not use, produce, process, or store hazardous materials in excess of threshold quantities that would trigger EPCRA reporting. Therefore TRI reporting (Sec. 313) is not necessary. However, emergency response planning has been implemented at the site. A

chemical inventory and MSDS database are maintained to aid in the efficient use and storage of chemicals and for worker safety and knowledge. In 2005, the Albany site had a chemical stand-down to reduce the amount of unused and unneeded chemicals and related materials. As a result of that action, 4,484 pounds of hazardous materials and 24,054 pounds of non-hazardous materials were identified and removed from the site. This essentially eliminated the administrative burden of managing this large volume of chemicals in 2006.

The photograph used on the front cover of this report was taken by the Fairbanks office. The photograph shows a pumping operation performed at Hinzeman Lake in Alaska that is managed through the Fairbanks office. The actual location of the Fairbanks office is in rented space in the Duckering Building on the campus of the University of Alaska at Fairbanks. In 2006 the office undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the office. Any significant new environmental impacts would be associated with offsite projects supported or funded through the Fairbanks office.

The Tulsa office is located in The Williams Center, a downtown office building complex in Tulsa, OK. The offices are leased from the Southwestern Power Administration (SWPA). In 2006, the Tulsa office undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the offices.

Please refer to the remaining text of this report for a fuller description of all environmental activities conducted at NETL in FY 2006.

2.0 INTRODUCTION

2.1 General Information

The National Energy Technology Laboratory (NETL) is part of the Department of Energy's (DOE) national laboratory system and is the only U.S. national laboratory devoted to fossil energy research. NETL supports the DOE mission to advance the national, economic, and energy security of the United States.

NETL has expertise in coal, natural gas, and oil technology research, contracting and project management of fossil energy research, systems analysis of energy conversion technologies, and energy supply and production issues from both a national and international perspective. In addition to research conducted onsite, the NETL project portfolio includes research and development conducted through partnerships, cooperative research and development agreements, financial assistance agreements, and contractual agreements with universities and the private sector. Together, these

efforts focus a wealth of scientific and engineering talent on creating commercially viable solutions to energy and environmental problems.

NETL has sites in Morgantown, West Virginia; Pittsburgh, Pennsylvania; Tulsa, Oklahoma; Albany, Oregon; and Fairbanks, Alaska. In total, these sites include 81 buildings and 14 major research facilities on nearly 200 acres. More than 1,100 employees work at NETL's five sites; roughly half are Federal employees and half are site support contractors.

NETL is organized into six strategic units:

The **Strategic Center for Natural Gas and Oil** (SCNGO) integrates all elements of the DOE natural gas and oil research. SCNGO is charged with implementing science and technology development to resolve the environmental, supply, and reliability constraints of producing and using oil and gas resources – resources that account for more than 60 percent of the energy consumed in the United States. With core competencies and expertise in all aspects of natural gas and oil, SCNGO investigates and manages research and development leading to improved natural gas and oil production and use. SCNGO invests in projects that promise tangible benefits to the nation, including a cleaner environment and increased domestic natural gas and oil production.

The **Strategic Center for Coal** (SCC) works to ensure national energy security and economic prosperity through the production of clean, affordable electricity and fuels, including hydrogen from coal, the nation's most abundant energy resource. The SCC is charged with implementing research, development, and demonstration activities to resolve the environmental, supply, and reliability constraints of producing and using coal resources. Environmentally responsible coal production technologies will allow the United States to meet growing electricity demand and to lay the foundation for a sustainable hydrogen economy.

The **Office of Systems, Analyses and Planning** (OSAP) conducts studies of large, complex systems, such as industrial or ecological processes, and the interactions among those systems, including the social, economic, political, regulatory, technological, design, and management properties, each of which are systems in their own right. The complex nature of these systems requires an interdisciplinary approach. System studies provide input to decisions on issues such as national energy plans and programs, resource use and environmental and energy security policies, research and development directions, and deployment of energy technologies. System studies are also used to support planning exercises at various organizational levels. Systems analysis focuses on production

and processing of fossil fuels and energy and fuel systems synthesis and design. Benefits analysis performs prospective and retrospective analysis of benefits stemming from program investments in fossil fuel-based technologies. Situational analysis collects data and assesses current and long-term trends within the energy industry that may impact energy production and use.

The **Project Management Center** (PMC) harnesses expertise and talent for non-fossil energy research, development, and demonstration projects, including those with other federal organizations such as DOE's Offices of Energy Assurance and Energy Efficiency and Renewable Energy and the Department of Homeland Security. PMC performs overall management and implementation of these customers' advanced initiatives, providing technical expertise, analytical tools, and a full suite of implementation skills.

The **Office of Research and Development** (ORD) performs basic and applied research and development in fossil energy and environmental science. Building on historic laboratory strengths and competencies, ORD focuses on four primary research topics, termed "focus areas", that are designed as concentrated research topics recognized as increasingly important issues for the 21st century:

- Energy system dynamics focuses on natural gas technology development, including higher efficiencies and lower costs in the use of advanced gas turbines and fuel cells.

- Geological and environmental science focuses on the minimization and abatement of environmental problems associated with the use of fossil fuels. Research topics include geological sequestration of carbon dioxide, oil and gas exploration and production, air pollution/particulate matter issues, and removal of toxins from the emissions in coal utilization systems.

- Computational and basic science develops tools that enable more rapid and efficient scaling-up of new sub-systems, devices, and components to commercial-scale.

- Materials science specializes in the lifecycle research of metals, alloys, and ceramics and the recycling and remediation of waste streams associated with these processes.

The **Office of Institutional and Business Operations** (OIBO) plans, directs, and coordinates administrative, operational, construction, and staff support activities for

the laboratory, including organization and human resource management; the laboratory's chief financial officer (CFO) function; budgetary and financial analyses and administration; information technology management, maintenance and implementation; onsite ES&H program execution, compliance, and remediation activities; acquisition and assistance services; site management, including design, construction, operation, and maintenance of NETL facilities; an internal control program; security services; real and personal property management; and administration of the non-primary site support contracts. Particular functional and technical specialists participate individually or on teams to ensure timely information exchange, to coordinate responses to action items affecting FE and DOE crosscutting functional issues, and to provide support to specific functional offices.

2.2 Focused Standards List

NETL is committed to ensuring compliance with all of the environmental requirements impacting the Albany, Fairbanks, Morgantown, Pittsburgh, and Tulsa sites. Compliance with the extremely large number of requirements that are found in the DOE directives; executive orders; federal, state and local codes; federal, state, and local regulations; acquisition letters; negotiated agreements; and consensus standards is extremely challenging. To assist with the achievement, NETL established a shortened list of requirements that specifically apply to NETL operations. This shortened list is called the *Focused Standards List,* and it embodies all of the requirements that apply to NETL operations.

The Focused Standards List was created by the NETL ES&H subject matter experts from the universe of ES&H standards and requirements known to exist. These ES&H subject matter experts oversee approximately 74 ES&H programs that are coordinated by the ES&H Division. Standards and requirements determined by the subject matter experts to be applicable to the NETL ES&H program are incorporated into one or more NETL directives. The NETL directives provide the policy, programs, and procedures used to implement these standards and requirements. In total, there are 139 directives, including 10 orders, 17 operating plans, and 112 procedures. Every directive contains a set of requirements that the directive addresses in the body of the document. All the requirements that are contained in the NETL ES&H directives collectively form the NETL Focused Standards List. All standards and requirements contained in NETL ES&H directives are captured in the Focused Standards List, and there are no standards or requirements on the Focused Standards List that are not implemented through one or more of the NETL directives.

The Focused Standards List includes both the standard or requirement citation and the location where the standard or requirement may be read. On a quarterly basis, the location that is published for the standard or requirement is checked to ensure that it is still available at that location. Most of the requirements identified in the Focused

Standards List are located on the internet, and the quarterly location check requires little more than to verify that the internet link is still active. Most of the standards are copyrighted. The standards are purchased, and one copy is placed in both the Morgantown and Pittsburgh libraries. On an annual basis, the Focused Standards List is analyzed to ensure that the standards and requirements listed are still applicable to NETL activities. In addition, approximately every 3 years the subject matter experts for the NETL ES&H directives review all of the directives and provide updates as appropriate.

Verification that the standards and requirements listed on the Focused Standards List are being implemented occurs through the following approach. First, NETL utilizes a rigorous Safety Analysis Review System (SARS) to review the details of a project before authorizing any significant activities to proceed. Checklists have been developed for the SARS to facilitate verification of the standards and requirements to be covered during the review. Also, ES&H subject matter experts provide support to the SARS process and ensure that applicable ES&H standards and requirements are addressed through the process. Second, NETL has retained the services of an independent third party auditor to perform comprehensive in-depth compliance assessments of specific ES&H programs. This auditor performed three such assessments in 2006, including workplace monitoring, facility SARS assessment, and the industrial wastewater program. It is anticipated that this effort will be increased during 2007 as NETL contracts with the U.S. Army Corps of Engineers to perform additional assessments. Third, NETL performs monthly walkthrough inspections of site facilities, targeting specific facilities each month so that all NETL facilities are inspected each year. These walkthrough inspections are attended by several ES&H subject matter experts who verify that NETL is in compliance with all of the standards and requirements. Finally, the preparation of the NETL Annual Site Environmental Report requires a complete review of compliance with all of the major standards and requirements. More than 60 subject matter experts participate in this effort to review the past year's performance in complying with the entire major, and many of the minor, ES&H standards and requirements listed on the Focused Standards List.

2.3 Discussion of Sites within the Document

Four principal sites and one satellite office, AEO, constitute NETL. Each office is located in a different state, is subject to different state and local laws, and focuses on different activities. Because most members of the public are interested in learning about only one site – the site located nearest them – this document splits the detailed discussion among the sites. The Albany, Morgantown, and Pittsburgh sites are

laboratories that have a broad array of environmental concerns, so a detailed discussion is provided for each below. Tulsa and the Alaska satellite office only perform administrative functions, so less is required to be said about their environmental impacts and regulatory compliance activities.

2.4 Accomplishments

NETL's efforts are focused on resolving the environmental, supply, and reliability constraints of producing and using America's fossil fuel resources. To accomplish this mission, NETL draws on 1,200 federal and support-contractor employees to implement and manage a broad spectrum of research programs. NETL conducts more than 1,800 onsite and contracted activities in the United States and in more than 40 foreign countries.

NETL's accomplishments are the result of research activities that demonstrate real and measurable progress toward national energy security, a cleaner environment, and a robust American economy. Some of the most important programs NETL implements are FutureGen, the Clean Coal Power Initiative, the Methane Hydrate Research and Development Program, and the Modern Grid Initiative.

- FutureGen is a $1 billion industry-government partnership to design, build, and operate a coal gasification-based, near-zero-emission electricity and hydrogen production plant. The 275-megawatt prototype plant will serve as a large-scale engineering laboratory for testing advanced power, carbon capture, and coal-to-hydrogen technologies. A direct response to the President's Climate Change and Hydrogen Fuels Initiatives, the FutureGen plant will employ cutting-edge technology to make it the cleanest coal-fueled power plant in the world.

- The Clean Coal Power Initiative is a cost-shared, large-scale technology demonstration program between government and industry. Its goal is to accelerate the commercialization of advanced, affordable, and environmentally sound technologies powered by coal. Under this initiative, the nation's power generators, equipment manufacturers, and coal producers help identify the most critical barriers to coal's use in the private sector and select and demonstrate technologies that will economically meet environmental standards while increasing the efficiency and reliability of coal power plants.

- The Methane Hydrate Research and Development Program is helping the energy and scientific communities understand the nature and potential of naturally-occurring methane hydrate. In a collaborative effort, researchers from industry, academia, other DOE national laboratories, and other federal agencies

are exploring hydrate-related hazards to conventional deepwater oil and gas exploration, documenting the role methane hydrate plays in environmental processes, and researching the potential of methane hydrate as a source of domestic natural gas.

- The Modern Grid Initiative (MGI) is developing a shared vision for the modernization of the U.S. electric grid and creating a flagship government-industry partnership to invest significant funds in grid-technology demonstration projects. MGI-funded projects will develop an integrated suite of technologies and processes to move the grid toward modernization. Projects will address key barriers and establish scalability, applicability, and a path to full deployment for solutions that offer compelling benefits. Each project will involve a full spectrum of national and regional stakeholders and multiple funding parties.

This is only a sample of the accomplishments made by NETL in 2006. For a more complete description of NETL's accomplishments, please see NETL 2006 Accomplishments, located on the NETL internet website.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

3.1 Introduction to the NETL EMS

The Pittsburgh and Morgantown sites have implemented an EMS around the ISO 14001 standard. Albany received certification on June 9, 2005, while working under the Albany Management System (AMS), which is Albany's EMS-compliant system. Pittsburgh and Morgantown received initial certification on August 31, 2003, maintained that certification throughout 2004 and 2005, and were recertified in 2006. Tulsa and Fairbanks are not required to have an EMS, because these two operations are not a facility as defined by EO 13148; their activities are strictly limited to desktop operations that do not impact environmental programs.

The Morgantown and Pittsburgh sites were recertified as a single entity in 2006 by NSF-International Strategic Registrations, Inc. Albany was recertified by Orion Registrar, Inc. To maintain certification, surveillance audits are conducted every 6 months at Morgantown and Pittsburgh, and every 12 months at Albany, to measure continual improvement to the EMS and adherence to the ISO 14001 standard. By maintaining ISO 14001certification, NETL demonstrates to its workforce, the surrounding community, DOE, and other stakeholders that NETL takes its responsibilities for environmental stewardship seriously.

The EMS assures consideration of environmental impacts of day-to-day activities and minimizes these impacts as much as possible, consistent with the mission of fossil energy research and development (R&D). The EMS, as described in NETL Order 450.1, Environmental Management System, includes a policy statement, top-down

responsibility, personal accountability for work being performed, regulatory awareness, document control, goals, self assessments, and continuous improvement activities.

The scope of the AMS for the Albany site covers all activities on site. Information about customer and stakeholder needs are translated into requirements for Albany's research, ensuring that resources and controls for performing research are in place, that the highest quality goods and services are delivered, and that payment for the delivered products is obtained using processes in the AMS. The AMS also addresses the requirements of controlling the impact of Albany's operations on the environment, on the health and safety of employees, and on the local community.

The scope of the EMS for the Pittsburgh and Morgantown sites covers onsite operations involving employees at the Morgantown and Pittsburgh sites, including onsite R&D activities, site operations, and the supporting administrative functions related to these activities and operations. Operations not owned or controlled by NETL are excluded from the EMS, such as the credit unions, childcare facilities, and the Navy tower operations.

The underlying framework of the EMS is the DOE Integrated Safety Management (ISM) system, whereby ES&H accountability is integrated into individual decisions and corporate planning processes. ISM provides for a plan-do-check-act approach to maximizing safety of the workforce and the public. The EMS uses the same philosophy to protect the environment, both onsite and offsite, during the conduct of operations over which NETL has control.

3.2 Environmental Policy

Senior management created an environmental policy which has guiding principles to use when addressing environmental issues. NETL strives to reduce injuries to the workforce and to minimize hazards to the public and the environment. NETL requires consideration of potential environmental impacts when planning and executing work at all levels. The environmental policy was updated and approved by senior management in 2005 to align the policy with the 2004 version of the ISO 14001 standard and updated again in 2006 to include the Albany site.

Management commitment and employee involvement are required to minimize oversight and improve communications; however, responsibility for effective environmental performance rests with line management. Line management must

involve workers in the planning and execution of environmental programs and must fully communicate information to workers and others.

The Albany site created the AMS, which is an integrated management system, prior to being incorporated into the NETL family in FY 2006. The AMS is a single system which meets the requirements of safety, the environment, or any other system requested by its stakeholders. The results of such a system are that meeting these requirements are made a normal part of conducting operations, rather than simply adding tasks. As Albany work processes are merged with NETL work processes, the AMS is updated to reflect these changes. The eventual result will be a unified NETL Management System.

NETL uses the acronym PRISM to illustrate its policy (see Figure 3.2). PRISM also shows the successful incorporation of the DOE ISM into the ISO 14001 standards. The PRISM graphic is displayed widely at the sites as a reminder to employees and visitors of the NETL policy. The PRISM logo was updated in 2006 to address safety and health, as well as to support the NETL pursuit of OHSAS 18001 certification.

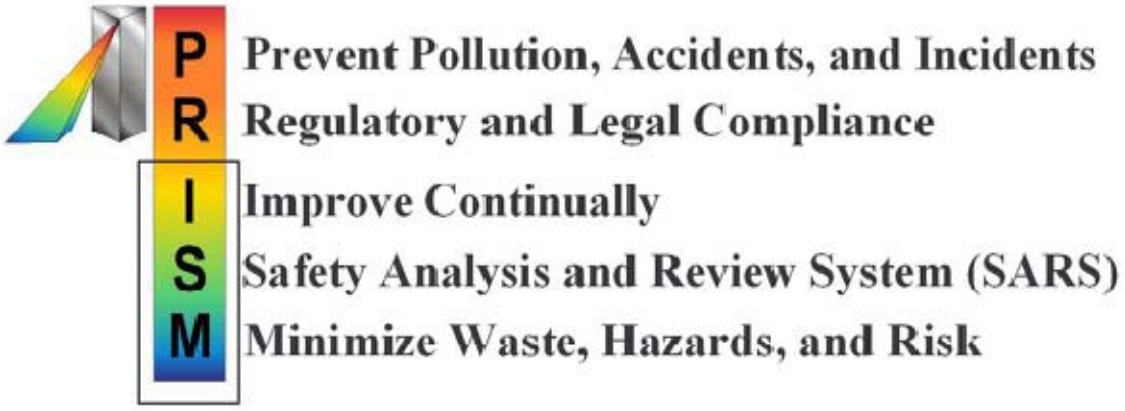


Figure 3.2 Illustration of NETL Environmental Policy

3.3 Identification of Environmental Aspects and Impacts

Determination of Pittsburgh and Morgantown environmental aspects requires input from a wide range of sources – onsite researchers, site operations personnel, and ES&H staff. Environmental aspects are impacts over which NETL has control or influence. All research projects, operations, and facilities have been inventoried and scored based on their potential for impacting the environment, natural resources, and environmental laws and regulations.

The significant impact scoring matrix is used to inventory and score each project, operation, and facility. The scores are reviewed by the EMS Crosscutting Team, a group of ES&H professionals and administrators consisting of both DOE and

contractor staff, to determine the most significant aspects of NETL activities. The team then recommends to the EMS representative which aspects should be considered for future activities.

The relative ranking of aspects is updated annually by the EMS Crosscutting Team, and the Registry of Significant Environmental Aspects is published. At the Albany site, aspects are updated on an on-going basis, rather than annually. The 2006 registry (see Table 3.3) provides a listing of the significant environmental aspects.

3.4 Environmental Objectives and Targets

Following the annual update and ranking of the significant environmental aspects of activities, Pittsburgh and Morgantown revise their environmental objectives and targets for the following year and gain approval from the Management Review Team for these revised objectives and targets.

Environmental objectives are goals that an organization attempts to achieve. Environmental targets are specific measurable or quantifiable criteria which support the objective. Performance measures are compared to targets to determine the degree of success in reaching an associated objective. Before establishing and reviewing its objectives, NETL considers regulatory and DOE requirements; technological options; financial, operational, and business requirements; and the views of interested parties.

The EMS representative assigns responsibility for the objectives and targets to various individuals with expertise in the respective subject area. These individuals develop environmental management plans (EMPs) that specify how NETL plans to attain the objectives. The approved objectives and targets based on the top ten aspects for 2006 appear in Table 3.4.

Albany has provided for its environmental objectives and targets through EMPs, including the Alternative Fuels for Lift Trucks Program; the Beryllium Identification and Remediation Program; the Energy Efficiency Program; the Lead-Based Paint Abatement Program; the Groundwater Program; and the Particulate Emissions Reduction Program.

3.5 Environmental Planning and Analysis Procedures

NETL takes a tandem approach to planning and managing its activities in an effort to minimize environmental impacts. Some activities require continuous control for the foreseeable future, while others can be completed in a single effort. Those activities requiring continuous control are managed through ES&H programs. Other activities that represent a concentrated effort are managed through EMPs.

ES&H Directives. Most activities that can impact the environment are routine and occur repeatedly during ongoing operations. One example would be the recovery and use of ozone-depleting refrigerants from appliances when the appliance undergoes maintenance. Because these activities are not one-time events, they are best managed through programs that are documented in directives (orders, operating plans, and procedures). These documents are written to describe how routine actions are undertaken to achieve the safety and environmental goals of NETL. Managerial responsibilities are attached to EMS/ES&H function titles. NETL directives are used to establish the foundation and control mechanisms of the EMS. The directives process is described in NETL Procedure 251.1-1, Directives Management System.

Environmental Management Plans (EMPs). Some activities that can impact the environment can be addressed through a concentrated effort that directly affect objectives and targets associated with the significant environmental aspects. An example would be replacing chillers that use ozone-depleting refrigerants with chillers that use non-ozone-depleting refrigerants. Short-term EMPs are developed and implemented to achieve near-term objectives and targets. The specifics of the process and elements of an EMP are explained in NETL Procedure 450.1-6, Environmental Aspects, Objectives, Targets, Management Plans, and Management Review. Each EMP specifies the nature of the action to be taken, the timeframe for the action, the responsible person(s) for the action, quantifiable targets, and how performance should be measured against the targets. Quarterly status reports are collected for EMPs to show progress on the activities documented in the plans.

3.6 Implementation and Operational Controls

The EMS is implemented through an organizational structure shown in Figure 3.6.1.

Senior level positions include the director, who serves as the ultimate authority for the EMS and is a lead member of the Management Review Team; the chief operating officer, who has authority for all on-site operations including in-house R&D and administrative support and crosscutting functions; the director of the Office of Institutional and Business Operations, who is the environmental steward and champion; and the division director for ES&H, who functions as the program administrator and the EMS representative. Mid-level titles and responsibilities are defined in several NETL directives that specify key components of the EMS. The ES&H division director assigns employees to the function titles and responsibilities.

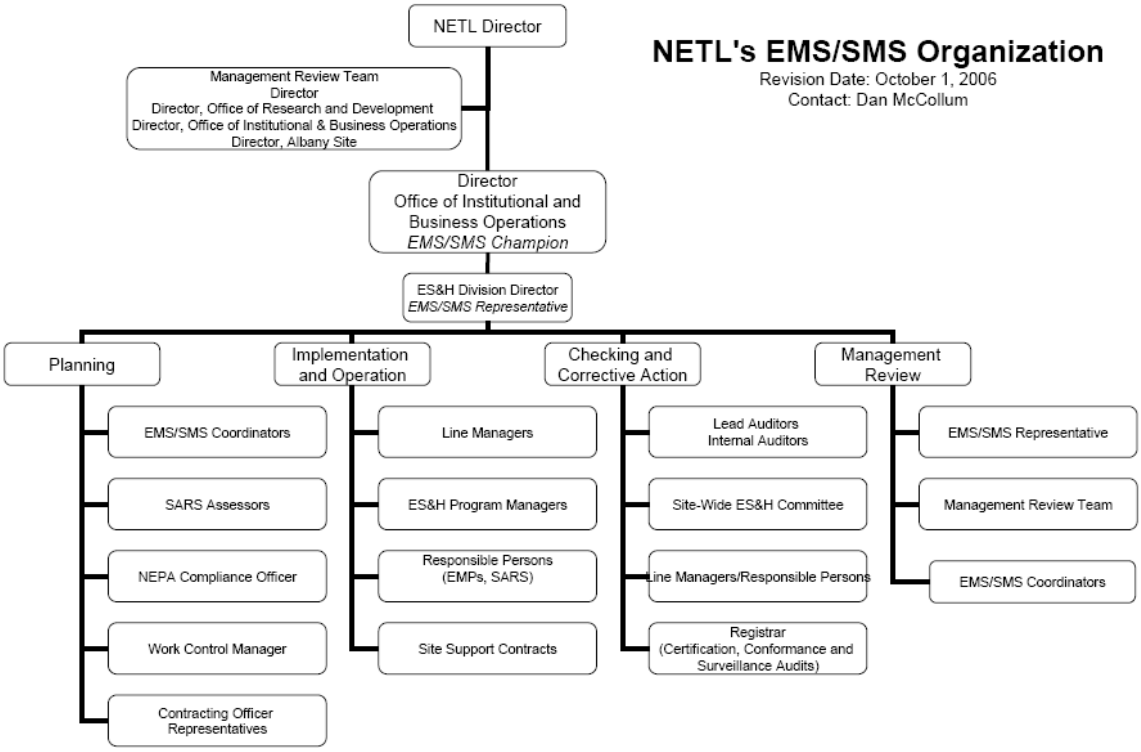


Figure 3.6.1. – NETL EMS/SMS Organization

In 2006, Albany began implementing NETL procedures and directives. This included aligning Albany with NETL procedures for chemical inventory. The software program CISPro® was procured, and plans were made to complete bar code labeling of all chemicals and record the chemicals in the chemical inventory.

Extensive internal communication is necessary to successfully implement any program. The NETL system of line management responsibility requires that line managers communicate effectively with the people working for them. Line managers are the primary means that NETL uses for achieving operational control.

EMS communication also occurs through the NETL Intranet, which is a secure internal website containing current versions of all NETL directives, as well as general reference information, forms, and programmatic information. On the EMS webpage there is an EMS Roadmap that provides an overview of available information about the NETL EMS.

Another example of internal communication at NETL is the bi-weekly regulatory review, which promotes awareness of regulatory changes and new programs. Every two or three weeks, an employee reviews federal and state agency websites while searching for announcements of changes in environmental laws, regulations, guidance documents, compliance information, and regulatory agency programs. The search also includes a DOE Headquarters website to check for new DOE requirements and

guidance. These reviews are circulated to the ES&H staff and posted on the NETL Intranet Post-It Board.

NETL communicates the EMS to its employees through the intranet, training, staff meetings, e-mail, and posters. The training program includes general EMS training designed to make employees aware of the EMS by providing them with information about the significant environmental aspects and the potential impacts of their work, employee roles and responsibilities, and the potential consequences of a departure from operating procedures. In addition to the general training, program- and job-specific training is required for all staff based on their job duties. The Computer-Based Training (CBT) system includes an evaluation that asks the user about their work assignments to obtain information about which training modules or types of training are needed. Job-specific training can also be requested directly by an employee or line manager. Every employee and their line manager is responsible for ensuring that all required training is complete before beginning work on an assignment.

For purposes of communication with external parties, NETL maintains an internet site – www.netl.doe.gov – that has EMS information available to the public, such as the EMS policy and the significant environmental aspects.

NETL conducts public participation activities under the National Environmental Policy Act (NEPA) program. For projects conducted offsite, NETL is required by law to use the NEPA process to identify potential environmental impacts, consider alternatives, invite public comment or participation, plan the project with due regard for the environment, impose mitigation requirements, and make informed decisions about whether to proceed with the proposed project. The NEPA process provides a system for reviewing actions prior to a major expenditure of funds to ensure the environmental and social impacts have been identified, analyzed, and will be mitigated to the extent practicable prior to committing to the project.

To effectively and efficiently implement the EMS, NETL has to maintain operational control of its onsite R&D projects, facilities, and operations. At Pittsburgh and Morgantown this is accomplished through the Safety Analysis and Review System (SARS). The process requires proposed projects to be described in writing and subjected to ES&H and quality reviews by various subject-matter experts and technical committees. Approval must be granted before a project, operation, or facility modification can proceed beyond the planning stage. Included within this process is a review of the potential environmental impacts, regulatory requirements, safety and health hazards, and monitoring plans. After a project begins, annual

reviews are required to make sure the project remains within the bounds and constraints that were previously imposed. If the project requires changes, the SARS package must be modified, and the SARS review is repeated. Other processes for operational control include the following:

- Environmental Programs. Baseline programs have been established for both defined media (air, surface water, and groundwater) and likely pollution routes (spills, hazardous waste, non-hazardous waste). Each program is explained by a NETL procedure and is managed by a NETL program manager at each site.
- Emergency Response System. NETL maintains processes to respond to accidents and emergency situations and for preventing or mitigating any environmental impacts that may occur. The Emergency Response Organization (ERO) conducts emergency response exercises annually and participates in emergency preparedness training. In 2006, NETL conducted exercises at the Morgantown and Pittsburgh sites. The exercise at the Morgantown site involved a truck making a delivery of empty drums to the new building construction site. The truck contained a leaking drum of nitric acid which was scheduled to be delivered to another worksite. The nitric acid had reacted with copper piping in the truck and created nitrogen dioxide gas. Two construction workers and the truck driver were overcome by the nitrogen dioxide upon entering the back of the truck. The incident required the extrication and decontamination of the three victims by site hazmat/rescue personnel, as well as remediation of the leaking 55-gallon drum of nitric acid.

  The exercise at the Pittsburgh site involved a delivery truck that lost control and rammed into the side of two tanks, a 275-gallon diesel and a 500-gallon unleaded gasoline tank, both located in front of B-901. The tanks broke loose from their support stands and were pushed over the edge of their underlying containment area by the delivery truck. Both tanks ruptured, spilling their entire contents onto the roadway in front of the tank storage area. Approximately 700 gallons of diesel fuel and gasoline entered the storm drains located in the roadway. The driver of the truck sustained serious head and back injuries. At the same time, an attendant performing continuous air monitoring for two entrants in a manhole located adjacent to the storage tanks is diverted from his duties by the crash. The confined space entrants performing maintenance on the storm drain system are subsequently overcome by an oxygen deficiency in the manhole. Later in the incident, an individual with false credentials, attempts to enter the site posing as a media representative.

- Contract Requirements. Work performed by contractors is controlled at the NETL sites through procedures that define the ES&H requirements for work on NETL property as well as for NETL-funded work at offsite locations.
- Affirmative Procurement Program. For procurement of goods at the NETL sites, a program has been established to require the purchasing of certain goods having recycled content, as outlined in NETL Procedure 541.2-1, Affirmative Procurement Program.

An integral part of operational control is documentation. Critical documents are controlled according to a defined process to ensure they can be located; they are periodically reviewed and revised; current versions are readily available; and obsolete documents are promptly disposed. The intranet is used as the tool by which up-to-date, approved, and official EMS documentation is provided to the NETL population.

Core EMS documentation is embodied primarily within the NETL ES&H directives. According to procedure, the most recent and official hard copy versions of NETL directives reside with the NETL directives coordinator. Electronic versions of these controlled directives are placed on the intranet for employee use and are considered to be official versions. Official copies of ancillary tables, lists, and forms are also maintained on the intranet and are reviewed and updated as required.

3.7 Self-Assessment Procedures and Corrective Action

NETL uses self-assessment procedures to improve ES&H performance through identification of non-conformances and tracking of corrective and preventive actions. Responsibility and authority for handling and investigating non-conformances and for initiating and completing corrective and preventive actions has been clearly defined by NETL as part of its processes. Several practices are employed including internal audits, reviews, and inspections; independent assessments; and reporting through the Assessment Information Input System (AIIS) for the Morgantown and Pittsburgh sites. Albany uses the commercially available program TrackWise® for tracking findings and corrective actions.

NETL conducts both internal and external audits of its EMS as required by the ISO 14001 standard. This process is defined in NETL Procedure 450.4-14, EMS Auditing. To maintain the ISO 14001 certification, an annual schedule is prepared that ensures that the entire standard is audited against the NETL EMS. There were four EMS audits performed in 2006, including one surveillance audit by the ISO registrar, and three internal audits.

Management's commitment to ES&H is evidenced by participation in monthly management ES&H walkthroughs. DOE and contractor managers, ES&H staff, facility operations staff, and union representatives participated in the walkthroughs, which cover all NETL facilities annually. Walkthroughs focus on readily-observable conditions of facilities (e.g., compliance with OSHA regulations, National Fire Protection Association (NFPA) codes, the National Electric Code (NEC)), and other environmental requirements). The status of corrective actions resulting from the walkthroughs is provided to senior management quarterly.

Annual SARS assessments are performed on new or modified R&D projects, facilities, and support operations. In addition, annual assessments are performed to ensure continued ES&H compliance. A full discussion of the SARS assessment process can be found in Section 3.9, Quality Assurance.

Program reviews are conducted annually by the responsible program managers for each major environmental program (e.g., the Water Quality Program, the Air Quality Program, and the Groundwater Program). These reviews are informal and may vary in scope and detail. During each review, managers attempt to verify that the requirements stated in the procedure are still relevant and are actually being met. When discrepancies are found, the program manager must decide whether to remove a specific requirement from the directive or to enforce the requirement. Some programmatic reviews occur more frequently or focus on monitoring results. These reviews look for trends, with the goal of identifying correctable problems and promptly taking action.

Site support contractor employees inspect various high-risk items periodically, document their findings, and provide the results to program managers. For example, daily inspections are performed at the hazardous waste facility and at selected potential spill sources. Weekly inspections are made of the storm water outfalls and industrial wastewater discharge points. Quarterly discharge monitoring reports are compiled and reviewed to see if any of the permit limits have been exceeded. Likewise, semi-annual surface water monitoring reports are compiled and reviewed. All of this information provides the program managers with an opportunity to assess the effectiveness of their programs.

Meaningful reviews for environmental compliance can occur only if the program managers remain abreast of the changing laws and regulations and any changed DOE administrative requirements. NETL supports several means of maintaining current awareness of the applicable regulations and laws:

- A bi-weekly regulatory review, generated at NETL, provides updates to the program managers that cover the major changes in laws and regulations, as posted on the websites of selected governmental agencies and as posted by DOE Headquarters (EH-41).
- Private sector publications are received by program managers, such as “Environmental Compliance in West Virginia,” a quarterly regulatory update bulletin published by Business and Legal Reports, Inc.; environmental compliance updates on CD ROM, published by the Bureau of National Affairs; and various trade journals.
- Program managers also draw on the Pennsylvania Bulletin and the Pennsylvania Code, which are produced by the Commonwealth of Pennsylvania, and the Code of Federal Regulations published by the National Archives.

- The NETL library subscribes to relevant regulatory documents.
- Program managers purchase updated lists of hazardous or regulated chemicals as needed.
- All environmental program managers periodically check the websites of regulatory agencies, such as the West Virginia Department of Environmental Protection (WVDEP) and the Pennsylvania Department of Environmental Protection (PADEP).
- Albany uses a regulatory review service, RegScan™, to provide for regular review of Federal and State of Oregon regulatory changes to ensure continued compliance with regulatory requirements.
- To develop general awareness of new areas of responsibility, program managers may take training classes on relevant statutes and regulations.

Ultimately, NETL relies on the professionalism and personal responsibility of the program managers, who are the subject matter experts of the ES&H Division, to do whatever is necessary for them to stay abreast of the changing laws and regulations. It is part of the program manager's general job responsibilities to stay abreast of regulatory issues that may affect the NETL EMS and to take appropriate actions to implement these requirements.

- Independent Program Assessments. In addition to internal audits, NETL conducts independent assessments of its ES&H programs through an external contractor to identify strengths, weaknesses, deficiencies, and recommendations for improvement. These assessments provide a look at regulatory compliance and assure that non-compliances are discovered and corrected. The contractor reviews internally- and externally-generated documents associated with the programs and interviews program managers and other involved personnel. The independent assessments cover (1) directives, policies, standards (including ISO 14001), permits, and regulations; (2) organization and administration; (3) staffing and training; (4) communication/dissemination of program information; (5) documentation and reporting; and (6) performance measurement. Programs assessed in 2006 were the Work Place Monitoring Program, Facility SARS, and the Industrial Wastewater Program.
- Workplace Monitoring Program. In general, the systems in place with regard to the workplace monitoring program are effective and contribute to the protection of workers and the environment. The system is effective in identifying workplace hazards and screening employees for the potential of exposure to those hazards. Line managers and support staff work cooperatively to reduce or eliminate exposures to employees.

It has not been necessary to conduct frequent industrial hygiene monitoring at NETL, since engineering controls had historically reduced personnel exposures to minimal levels. Monitoring of

most activities is largely driven by the SARS process, which establishes routines for operating facilities or research projects safely, inclusive of workplace monitoring.

- Facility SARS Program. In general, the systems in place with regard to the Facility SARS program are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities, applicable regulations, and best practices related to structural engineering, mechanical engineering, and construction safety.

  The Facility SARS process is used to determine the safety requirements for the design and construction of new and modified facilities. Certain selected renovation projects are done under a use permit, rather than the Facility SARS process, to reduce the administrative burden when a full SARS package would be unnecessary. The determination of whether to obtain a use permit or prepare a SARS package is generally made by the responsible person (RP) or facility custodian (FC), based on experience and professional judgment.

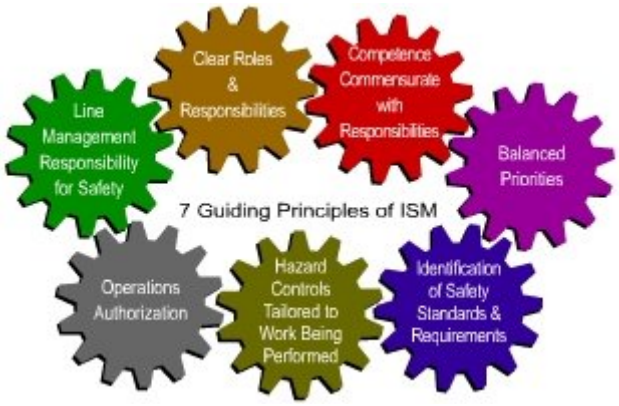
  Upon completion of a construction project, the facility is inspected by a team of ES&H personnel, who recommend any necessary remedies or approve the use permit. After the facility is approved for use, the inspection schedule reverts to an annual review by the ES&H staff to determine if required safety measures are still in place and operational controls are being followed. Deficiencies found during the annual inspection are documented on the Assessments Information Input System (AIIS), which automatically generates an e-mail message to the head of the Facility Safety Committee and the RP/FC.

- Industrial Wastewater Program. In general, the systems in place with regard to the industrial wastewater program are effective and contribute to the protection of workers and the environment. NETL does an excellent job of employee training that ensures employees know their responsibilities, applicable regulations, and best practices related to management of chemical hazards, including management and disposal of hazardous materials. Additional training is provided when needed for exceptional circumstances.

Non-conformances generated from all of the self-assessment audits mentioned above are documented using the internally developed AIIS corrective action database at Morgantown and Pittsburgh. Albany tracks non-conformances identified in assessments and audits within the commercially available TrackWise® software

system. The AIIS database is used for recording ES&H assessments and tracking corrective and preventive actions. Corrective action status is measured by data provided by AIIS or TrackWise®. All NETL employees have access to AIIS or TrackWise®, and instructions on the use of the systems have been communicated to everyone.

At Pittsburgh and Morgantown, NETL Procedure 450.4-4, ES&H Corrective and Preventive Action Process, outlines how corrective and preventive action items identified in the various assessments performed at NETL are captured, prioritized, assigned, tracked, closed, analyzed for root causes, and incorporated, as appropriate, into the lessons learned and training systems. This process holds responsible persons and line management accountable for timely closure of corrective actions implemented within their programs, organizations, or facilities and disseminates lessons learned across appropriate organizational elements at NETL.



In brief, after completion of an assessment, the lead assessor at Pittsburgh and Morgantown uses the AIIS database to generate an assessment record, which is identified by a unique number. Albany utilizes TrackWise®, for recording corrective and preventive actions. Individual findings and concerns that require corrective action are entered into AIIS or TrackWise® to ensure they are tracked to completion. When a finding or concern is entered into the system, a unique number is assigned and cataloged in the database with the associated assessment record. A notification of the finding is sent electronically to the responsible person and line manager. All actions taken regarding the finding are then documented in AIIS or TrackWise®. To ensure that the findings have been fully addressed, follow-up is done through the internal auditing process at Morgantown and Pittsburgh. At Albany verification and validation are performed when the work is reported as completed.

Other processes used for reporting corrective actions include NETL Procedure 151.1-2, Emergency Categorizations, Classifications, and Notifications, which is used to catalog and investigate major non-conformances as required by DOE, and NETL Procedure 231.1-2, Injury/Illness Investigation and Reporting, which sets forth the minimum requirements for injury or illness and property damage investigation and reporting for NETL.

3.8 Quality Assurance

Please see Section 4.13 for a description of the NETL Quality Assurance (QA) Program, including QA for the EMS and AMS.

3.9 Management Review Process

Management review of the EMS ensures that the policy and system remain appropriate and effective. The EMS representative/QA manager conducts semi-annual review meetings with the Management Review Team (MRT) (see Figure 3.6.1, NETL EMS Organization). During the review meetings, the MRT considers the environmental policy, objectives, targets, internal and external audits, and other related issues. Changes are documented and implemented. Management involvement guarantees that the projects are funded and the appropriate priority is placed on the issues that are identified. Notes from the MRT meetings are posted to the intranet.

In 2006, two MRT meetings were conducted approximately six months apart. During the first meeting, the MRT approved the 2006 objectives and targets, agreed to the reduction in internal audits from four to three based on successful internal audits over previous years, and requested changes to the AIIS be made to make it more user friendly. These actions were completed.

During the second meeting, the MRT requested that training be provided to employees prior to the ISO 14001 recertification audit, directed that the director of OIBO ensure that the Facility SARS process was being followed after internal audits found significant problems in this process, and generally demonstrated their continued support for the EMS.

4.0 COMPLIANCE SUMMARY

4.1 Major Environmental Statutes

NETL was in full compliance with all environmental statutes and regulations in 2006. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those statutes included CERCLA, SARA, RCRA, CAA, CWA, AEA, NEPA, and TSCA, and each are described in detail below.

4.2 Environmental Executive Orders

NETL was in full compliance with all applicable environmental executive orders in 2006. Throughout the year numerous inspections and audits were performed and documented to ensure that there were no instances of environmental non-compliance. Those executive orders included 13148, 13101, 11988, and 11990, and each are described in detail below.

4.3 DOE Internal Environmental and Radiation Protection Orders

NETL was in full conformance with DOE Order 450.1, which is the single major internal environmental protection order applicable to NETL. NETL does not operate a radiological program of similar scope to the DOE national laboratories administered under the National Nuclear Security Administration's control. However, a limited number of sealed sources were administered in full compliance with DOE Internal Radiation Protection Order 5400.5, as discussed below.

4.4 Atomic Energy Act of 1954

The Atomic Energy Act (AEA) of 1954 and its amendments require federal control of radiation source materials for the protection of the public and workers. DOE orders, EPA regulations, and Nuclear Regulatory Commission regulations are based on the AEA. To fulfill its obligations, DOE has implemented radiation protection programs at DOE facilities that process, produce, handle, use, or dispose radiation source materials.

NETL's sites in Morgantown and Pittsburgh do not process, produce, or dispose radiation source materials as a part of its routine operations. Morgantown and Pittsburgh use research instruments that contain sealed radiation sources. Most of these are small quantity emitters used to make various types of measurements. Additionally, the Morgantown site has four phosphorescent exit signs located in the hazardous waste accumulation facility. The radiation safety officers maintain an inventory of the radiation sources on site, indicating the item, isotope(s), quantity, custodian, location, status, and activity. Table 4.4.a lists the 2006 source inventory for Morgantown. Table 4.4.b lists the 2006 radioactive sealed source inventory for Pittsburgh. Table 4.4.c lists the 2006 X-ray radiation generating devices for Pittsburgh. During 2006, the Morgantown and Pittsburgh sites did not release any of the radiation source materials into the environment. All of the source materials are sealed from escape or discharge. No radiation source materials were sent to offsite storage or disposal facilities. The Albany site has legacy radiological issues, including the presence of ores that are naturally-occurring radioactive materials.

Albany is finalizing a radiation protection plan in 2006. Radiation exposure monitoring at the Morgantown, Pittsburgh, and Albany sites consisted of the use of several personal dosimeter badges. In addition, leak testing and analysis was performed on sealed sources at Morgantown and Pittsburgh by Applied Health Physics, Inc. Operational radiation sources at Albany are leak checked by certified personnel employed by Oregon State University.

4.5 Compliance and/or Cleanup Agreements

There were four ongoing compliance activities in the State of Wyoming during 2006, two active offsite remediation activities and two other sites that have been cleaned-up and are now only subject to continuing surveillance monitoring. The two active sites

have volatile and semi-volatile compounds in the groundwater and soils. Volatiles present are primarily benzene, toluene, ethylbenzene, and xylenes (BTEX). The semi-volatiles are primarily phenolic compounds. Pilot production tests of underground coal gasification and production tests of in-situ oil shale retorting caused the contamination at these sites. They are discussed in detail in Section 6.6.1.

4.6 Environmental Violations Cited by Regulators

There were no environmental violations cited by regulators in 2006.

4.7 Notices of Violation, Notices of Deficiency, Notices of Intent to Sue, and Other Enforcement Actions Issued.

Groundwater

Certain volatile organic compounds (VOCs) at levels above the State of Oregon's risk-based standards have been found in the groundwater at the Albany site, at Liberty Elementary School located adjacent to the site, and in drinking wells used by nearby local residents. Contaminants of potential concern include trichloroethene (TCE), tetrachloroethene (PCE), carbon tetrachloride, and chloroform. NETL-Albany began a groundwater monitoring program as a voluntary effort on site in 2001 and offsite in March 2005.

Given the detection of the VOCs, NETL continues to monitor the groundwater both on and off-site, perform applicable site investigations, document applicable risk assessments, and is a voluntary participant of the Oregon Department of Environmental Quality (DEQ) Cleanup Program. As a result, NETL works closely with the Oregon DEQ, the appropriate regulatory authority, to investigate the nature and extent of the contamination, as well as assess appropriate remediation methods. No enforcement action has been initiated by the DEQ against the DOE.

DOE may have some liability associated with the groundwater contamination at Liberty Elementary School and/or the contamination at several surrounding residences using wells as a drinking water source if the groundwater investigation reveals that NETL is a source of the contamination. The source of the contamination remained unknown at the end of FY 06. The City of Albany tested and certified the drinking water both on-site at NETL and at Liberty Elementary School and certified that it does not contain VOCs above Federal drinking water standards. Further**,** TCE, the prevalent VOC detected off-site, is a common chemical found in cleaners, degreasers, and paint thinners, the source of which may be from gas stations, dry cleaners, repair shops, or former businesses using such chemicals in the immediate vicinity of the NETL-Albany site.

Permanent monitoring wells were installed at Liberty Elementary School in September 2006 and are now included as part of the sampling plan. Sampling of monitoring wells will continue on a periodic basis until remedial actions are complete or until they are no longer appropriate. Albany will continue to investigate potential sources, and confirm the nature and extent of the contamination. Current plans also include the development of a site investigation report to document work efforts to date and completing human health risk assessments both on and off-site at Albany. Once the investigation is complete, NETL will conduct a phased risk assessment and determine and implement the appropriate remedial actions. NETL will continue to cooperate with the Oregon DEQ in conducting these activities.

Beryllium

The NETL-Albany site was engaged in a variety of metallurgical and materials research projects and activities, some of which involved beryllium (Be), until the early 1980s. In 2005, beryllium surface contamination above the threshold limits for contamination specified in 10 CFR Part 850 was discovered in several areas of the NETL-Albany site. In response, Albany began a systematic process of identifying all beryllium-contaminated areas and evaluating the potential levels of residual beryllium throughout the site. In 2006 and 2007, Albany continued testing the facility for the potential spread of beryllium by performing beryllium inventory sampling. To date over 95% of the site has been characterized. Areas of concern are being evaluated with respect to background levels and other naturally occurring sources of beryllium (such as building materials).

To limit potential exposure of its employees to beryllium, the site has restricted access to a number of its facilities and requires protective measures to be taken for individuals requesting access to perform work in these areas. Taking a conservative approach, the site has additional worker safety measures, including the provisions of 10 CFR Part 850 for establishing a Chronic Beryllium Disease Prevention Program.

4.8 Reportable Occurrences

NETL filed three occurrence reports in 2006 into the DOE Occurrence Reporting and Processing System (ORPS). One report resulted from a potable water line break at Pittsburgh, causing potable water to percolate up to the surface and ultimately releasing turbid water into the nearby waterway. The two other ORPS reports addressed safety concerns that did not involve any significant harm, but were reported because there was a potential for the incident to be repeated and/or the potential existed for the injury to have been significantly more severe. One of those safety ORPS reports was reported when a diamond plate covering outside stairs broke loose from the stairs as an employee was descending them, causing the employee to fall down several steps. The other incident was reported when it was discovered that an employee had failed to properly lock out a high pressure nitrogen line prior to performing work on the line.

4.9 Major Issues, Instances of Non-compliance, and Corrective Actions

There were no major issues, instances of non-compliance, or corrective actions at NETL in 2006. The minor issues are discussed above in Section 4.7.

4.10 Status of Ongoing Self-Assessments and/or Environmental Audits

NETL continued to maintain the ISO 14001 certification at the Albany, Morgantown, and Pittsburgh sites in 2006. Morgantown and Pittsburgh completed an independent, third party Recertification Audit on April 11-14, 2006, and three internal audits were performed throughout the year. Albany did not conduct an independent third party audit of the ISO 14001 certification in 2006.

4.11 Existing Permits

A summary of environmental permits for the Morgantown site is provided in Table 4.11.a and for the Pittsburgh site in Table 4.11.b. Albany maintains a wastewater discharge permit with the City of Albany.

4.12 Emergency Preparedness

NETL won a 2006 Fossil Energy Environment, Safety, Security and Health Award for innovative HAZMAT team training methods. This award was based on how NETL maintains processes to respond to accidents and emergency situations and for preventing or mitigating the environmental impacts that may occur. The Emergency Response Organization (ERO) conducts emergency response exercises annually and participates in emergency preparedness training. In 2006, NETL conducted one emergency response exercise at the Morgantown site involving a chemical spill and included emergency medical rescue. An exercise at the Pittsburgh site involved a confined space rescue and environmental mitigation. Both exercises were observed by an Office of Fossil Energy program manager from DOE HQ. The exercises identified a major corrective action involving long term improvement to the public affairs team. NETL emergency preparedness teams were deployed to the Joint Information Centers in both counties (Monongahela and Allegheny) in 2006, and there were several joint training classes conducted to facilitate teaming between these counties and NETL emergency preparedness teams.

4.13 Quality Assurance

NETL is responsible for a wide range of work activities, including basic and applied onsite research; contract administration for offsite research, development, and demonstration projects; design, construction, operation, modification, decommissioning, and environmental remediation of NETL facilities; and the management and oversight functions related to these activities. NETL's Quality Assurance (QA) Program provides the tools to ensure that this work is accomplished

safely while minimizing potential hazards to the public, site workers, and the environment. The QA Program is based on DOE's ISM principles, ISM core functions, and DOE Order 414.1C -- Quality Assurance.

Line management accountability for ES&H issues is an integral part of the QA Program and ISM. NETL implements this through work performance goals for which all line managers are accountable. Internal assessments and audits also ensure that line managers are accountable for their ES&H responsibilities.

Another principle of ISM is competence commensurate with responsibilities. NETL's ES&H training program provides a process for ensuring that employees get the appropriate ES&H training they need to protect themselves, their coworkers, the public, and the environment.

NETL uses an electronic job hazard survey to identify both general and specific ES&H training courses that employees need. Survey questions focus on potential hazards and responsibilities associated with the various tasks of an individual's job. Training needs are also identified and documented through the SARS process. This training analysis includes defining requirements to show competency, including appropriate education, training, and experience, as well as an understanding of the importance of NETL's environmental aspects for project design and operation, including support operations. ES&H training records are managed through NETL's CBT system, DOE and contractor human resource departments, and official SARS files.

The SARS process is the backbone of NETL's QA Program for ES&H. Much of the needed data regarding hazards and environmental impacts are generated from this process; therefore, it is important that it work effectively. NETL has three distinct SARS processes: one each for R&D, facility, and support operations.

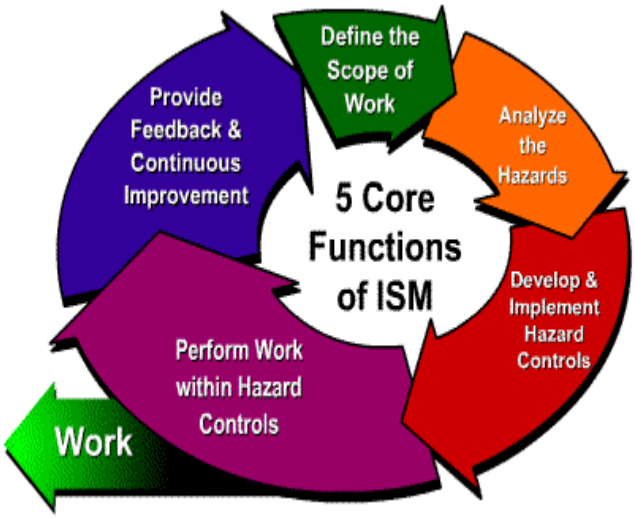
At Morgantown and Pittsburgh, the R&D SARS procedure, NETL P 421.1-1, describes the process and procedural requirements for a safety analysis and review of onsite R&D projects. The purpose of this safety analysis and review is to ensure that risks associated with NETL's onsite R&D projects are analyzed, understood, and then eliminated, mitigated, or controlled to a degree acceptable by line management before work begins. All onsite R&D projects receive a SARS operating permit after successful completion of the SARS review. Albany uses a job hazard assessment (JHA) process and writes standard operating procedures (SOP) for all hazardous tasks on site.

An annual review is conducted on all SARS-permitted R&D projects by a team made up of, at a minimum, the project's responsible person (or designee), an ES&H representative, a project quality assurance engineer (PQAE), and the site's environmental manager. The assessment includes: (1) a check for significant modifications made to the project without appropriate authorization and SARS review; (2) an ES&H Division inspection of the project area covering chemical hygiene, OSHA requirements, and environmental compliance; (3) a review of the SARS files and the

project area for engineering design and QA/quality control concerns; and (4) a review of problems found in the project area or in the SARS file. Records from each annual assessment are added to the SARS file.

Findings from the annual assessment are assigned a priority by the assessor or ES&H representative: Priority 1 findings are urgent actions and are required to be corrected within 7 days; priority 2 findings are serious deficiencies and are required to be corrected in 45 days; priority 3 findings are considered non-serious deficiencies and are required to be corrected in 120 days; and priority 4 findings are considered de minimis deficiencies which are to be corrected within one year. After assignment, findings are sent to the responsible person for correction using the AIIS. The responsible person's supervisor is copied on the finding.

NETL's Facility SARS Procedure (NETL P 421.1-3) covers onsite facilities including buildings, trailers, utilities, services, structures, roads, and walkways. The purpose of this safety analysis and review is to ensure that facilities are constructed, maintained, and modified in compliance with applicable codes, regulations, and standards. The Facility SARS Procedure provides for construction permits, which are required prior to new construction or modification of an existing facility, and for use permits, which are required prior to occupancy of a facility or changing the use of a facility.



An annual ES&H assessment is performed of all SARS-permitted facilities by an ES&H assessment team made up, at a minimum, of the facility's custodian and ES&H staff, including the OSHA safety manager, the chemical hygiene officer, the environmental manager, and the life safety officer. Findings are assigned a priority based on significance and recorded in the AIIS database for tracking.

NETL's Support Operations SARS Procedure, NETL P 421.1-2, covers onsite support operations conducted by site support contractors, such as construction, operations, maintenance, and renovation activities for which they are responsible, and ensures that associated risks are analyzed and understood and then eliminated, mitigated, or controlled to a degree acceptable by responsible line management prior to initiation of the project or operation.

An annual assessment is conducted on all SARS-permitted support operations. The purpose of the annual assessment is to determine the continued validity of the SARS package and to address any changes in the operations. Typical items that might be re-evaluated include changes in site conditions, worker training, operating procedures, and the effectiveness of controls.

4.14 Performance Measurement

Goal setting is an excellent approach to motivate and monitor performance. NETL's environmental performance and progress toward goals is tracked and reported to satisfy both internal and external requirements. Throughout 2006, trained ES&H professionals performed extensive crosscutting audits and inspections of the NETL ES&H program to ensure adequate performance. The performance measures used to monitor progress include *EMP Objectives and Targets* (see Section 3.4) and institutional environmental performance measures. This includes NETL's performance measures established under the Government Performance and Results Act (GPRA) of 1993. The results of these measures are presented in Table 4.14.a *CY 2006 EMP Metrics*. A summary of the same environmental performance measures is presented in Table 4.14.b. These measures are tracked on a fiscal year basis. They cover performance goals and accomplishments for FY 2006. In addition to these measures, surveillance monitoring is conducted through routine reviews and inspections. The type of performance monitoring conducted through this program is presented as Table 4.14.c, *Surveillance Monitoring*.

BEGIN SEPARATE SITE ANALYSIS

5.0 MORGANTOWN

5.1 Site Description

The Morgantown site resides within Monongalia County, West Virginia, on the northern end of Morgantown. This location is about 70 miles south of Pittsburgh, Pennsylvania, and about 200 miles west of Washington, DC. Geographically, the facility sits within the rolling hills of the Appalachian Plateau, about 1,000 feet east of the Monongahela River and about 10 miles west of Chestnut Ridge, the westernmost ridge of the Allegheny Mountains. The Morgantown site covers approximately 132 acres, 46 acres of which are developed as an industrial area. Two small streams border the site on the east and northeast sides, and all surface drainage goes into these two streams. Immediately surrounding the Morgantown site, the land use is a combination of residential, commercial, deciduous forest land, and pasture.

The Morgantown site focuses on technologies in coal utilization, natural gas production and utilization, and energy efficiency. This work is accomplished through both in-house R&D and contracted research. There are approximately 600 employees at the Morgantown site, roughly half are Federal employees and half are site support contractors.

As of the 2000 U. S. Census, Morgantown's population consisted of 26,809 people, 10,782 households, and 4,183 families within the city limits. The population density was 1,056.2 people per square kilometer (2,736.0 people/mi²). There were 11,721 housing units at an average density of 461.8 units per square kilometer (1,196.2 units/mi²). The racial makeup of the city was 89.48% White, 4.15% African American, 0.17% Native American, 4.15% Asian, 0.05% Pacific Islander, 0.51% from other races, and 1.48% from two or more races. The Hispanic or Latino makeup of any race was 1.54% of the population.

The median income for a household in the city was $20,649, and the median income for a family was $44,622. Males had a median income of $33,268 versus $24,944 for females. The per capita income for the city was $14,459. About 15.0% of families and 38.4% of the population were below the poverty line, including 23.3% of those under age 18 and 8.3% of those who are age 65 or over. However, it should be remembered that traditional poverty statistics can be misleading when applied to

communities with large university student populations, such as Morgantown. The major employers within the Morgantown area are West Virginia University (WVU), WVU Hospitals; Mylan Laboratories, Inc.; the Monongalia County Board of Education; the Monongalia Health System, Inc.; University Health Associates; the National Institute for Occupational Safety and Health; NETL; and the Health South Rehabilitation Hospital.

5.2 Major Site Activities

Stage I construction activities of the Technology Support Facility (TSF) at Morgantown continued during 2006. Site excavation, foundation, and foundation wall construction were completed. Installation of structural steel, windows, stone façade, build-out of roof penthouse, and installation of the roofing system was initiated with scheduled completion of this phase to be accomplished in early FY 2007. When completed, the TSF will be a multi-story, 106,000-square foot structure and house 168 offices. TSF was designed and is being constructed to obtain U. S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Gold Certification. When completed, the facility will be one of the most energy efficient and cost effective federal structures built to date. The TSF is being designed and constructed to consume 43% less energy than a typical building designed to meet ASHRAE 90.1-2001 Standards. The Department of Energy and NETL will realize utility and operational cost savings of approximately $1.5 million dollars annually. The TSF is scheduled for completion in 2008.

NETL began collecting and analyzing Building 26 energy usage under a co-funded energy management project with the DOE Federal Energy Management Program (FEMP). Meters were installed for electricity, steam (heating), natural gas, chilled water, and domestic water useage. This facilitated the analysis of baseline and performance data to enable NETL to classify B-26 as an Energy Star Building. This co-funded program, which includes $57,000 of FEMP funding, incorporates installation of energy utility meters and specialized programming in the building, which is a multi-story, 63,062-square foot office/conference/administrative facility. The metering and associated programming will monitor and analyze annual and real time energy usage in the facility. The initial one-year performance period of this project will establish an annual baseline energy usage. Subsequent analyses will verify energy savings of installed energy conservation retrofit measures. The intent of the model program is to demonstrate the benefits of obtaining the Energy Star Building Label and to share the information with other sites in the DOE complex so that final results can be duplicated or improved. Initial baseline data will be analyzed

and reported to the DOE Office of Federal Energy Management Program in September of FY 2007.

Facility Repairs Completed. The exterior façade of Buildings 26 and 3 were repaired and replaced, including removal of old deteriorated brick and mortar followed by replacement with Dryvit® water barrier façade to ensure that the building envelope is water-sealed. The in-ground wiring and the lighting systems were repaired and new energy saving light sensors were installed in the site courtyard. Energy saving insulation was installed on the site nitrogen supply system and condensate line. The parking garage lighting was relocated and replaced to improve lighting efficiency. Seals were installed in the parking garage to prevent water from pooling on the floor surface, which was causing the formation of dangerous ice pools in the winter. Approximately forty fire-resistant doors were replaced throughout the site that were considered a safety risk in the event of an emergency.

6.0 COMPLIANCE STATUS

6.1 Environmental Restoration and Waste Management

6.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Morgantown had no National Priorities List (NPL) sites in 2006 and has never been proposed as an NPL site. Furthermore, NETL has never been on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list or the West Virginia Hazardous Waste Site list (state equivalent of CERCLIS). There were no reportable releases in 2006.

During the past 25 years, there have been several onsite cleanup activities. Some of these activities followed the closure of facilities that had leaked for a number of years. Other cleanup activities followed discrete spills. Table 6.1.1 provides an overview of these events in terms of the sources, the contaminants, and the current status of the sources and contaminants at the site. A list of the specific chemicals or materials of concern is presented in Table 6.1.2, *Properties of Potential Contaminants.*

6.1.2. SARA Title III

The Emergency Planning and Community Right-To-Know Act (EPCRA) requires facilities that store hazardous materials in quantities exceeding threshold amounts to notify the state emergency response commission, to cooperate in local emergency response planning activities, and to submit hazardous material inventories and MSDS documents to the local and state emergency response and planning organizations. It also requires the reporting to the EPA and to

designated state officials of any annual releases of toxic materials that are used, produced, or processed in quantities exceeding threshold amounts. The inventory requirement is triggered when the facility stores more than 10,000 pounds of a hazardous material (as defined by OSHA) or more than 500 pounds, 55 gallons, or the specific threshold planning quantity of a listed extremely hazardous substance.

To help comply with these regulatory requirements, NETL developed Procedure 440.1-2 (B), *Chemical Inventory and SARA Title III Reporting*, which is implemented by the NETL chemical hygiene officer. The program revolves around a computer-based chemical inventory system that is continually updated as materials are purchased, consumed, or disposed. The database is verified annually by representative samplings of work areas to determine whether observed types and quantities of materials match the database information. Chemicals arriving on site must be accompanied by an MSDS, or they will be held at the warehouse until the MSDS is obtained. When a prospective buyer wants a particular chemical, they must first check the intranet-based chemical inventory and the waste accumulation list to determine if it is available on site. If not, they may obtain a purchase request for the chemical. The purchase request is reviewed by a specialist who assigns an MSDS number, if an MSDS is already on file. The specialist also attempts to determine if less hazardous substitutes are available. When the purchase request is cleared, the purchase can begin. When chemicals arrive on site, tracking begins. First, the chemicals are tagged and logged into the database. When the chemicals are moved to a new location, the database must be updated with the new location of the materials. When the empty container is picked up or when the remaining material is sent to the hazardous waste facility for disposal, the item is removed from the database.

The Morgantown site provides chemical inventory reports (Tier 2) to the Monongalia County Local Emergency Planning Committee and the Morgantown Fire Department. Hydrogen sulfide (1700 pounds daily average) is the only chemical present at the Morgantown site in excess of the threshold planning quantity, as defined by SARA Title III. Hydrogen sulfide is stored as a compressed gas in metal cylinders. Other materials that are reported are carbon dioxide (average daily amount stored is approximately 3600 pounds (1800 pounds daily average) and nitrogen (average daily amount stored is approximately 7922 pounds (59,386 pounds daily average)). Nitrogen is stored outdoors in an above-ground storage tank and in individual gas cylinders.

The Morgantown site does not generate a toxic release inventory (TRI) because the site does not release any of the listed toxic materials in quantities that exceed the TRI threshold amounts. During 2006, there were no releases that would trigger emergency notification as required by either EPCRA or CERCLA.

6.1.3. RCRA Program

RCRA classifies sites as generators, transporters, or TSD facilities. The Morgantown site is regulated as a large quantity generator and is under the jurisdiction of WVDEP. Although hazardous waste generation rates are low for most months, occasional lab activities result in the generation of larger quantities that exceed the threshold for large quantity generators. See Table 6.1.3 for summary information on waste generation and management. NETL does not hold a permit as a transporter or TSD facility for hazardous waste, nor does it hold a permit for treatment or disposal of non-hazardous waste that would be regulated under RCRA Subtitle D. Hazardous waste may be stored on site for no more than 90 days without a permit. During 2006, hazardous waste materials were transported to the storage and treatment facilities of American Environmental Services (AES), Inc., located in Westover, WV, a town adjoining Morgantown. At the AES facility, small packages of similar waste are combined and repackaged for more cost-effective shipment to a final disposal facility selected by AES. Non-hazardous waste (normal office wastes that are not recycled and cafeteria waste) is transported by Browning Ferris Industries (BFI), Inc., to the Meadowfill landfill, located near Clarksburg, WV.

NETL complies with the RCRA manifest requirements by initiating documentation when hazardous wastes are shipped from the Morgantown site. The NETL hazardous waste coordinator initiates the documentation and files copies of the manifests, forms, waste profiles, and contracts. Ultimately, these documents are sent to the NETL ES&H Records Center.

NETL does not have an onsite program to treat hazardous waste or render them harmless; however, NETL does recycle some semi-hazardous materials (materials classified under RCRA as universal waste). During 2006, NETL recycled batteries, fluorescent light bulbs, and various items containing mercury.

Onsite hazardous waste handling is governed by NETL Procedure 450.1-9, *Waste Handling, Storage, and Disposal*. This procedure requires lab workers to put their own hazardous waste into labeled containers (drums, buckets, bottles) in their labs. NETL provides various types of containers and labels for this purpose. Labels must include a list of the contents of the container and the name of the responsible party (producer of the waste). An internal manifest is attached to waste containers for internal tracking and identification. Laboratories have satellite accumulation areas where the waste awaits transport by technicians to the on-site collection area located in B-33. Technicians who transport the waste on site inspect the waste for proper containment, labels, and completed documentation. They will not move waste that lacks these items. When unlabeled and unidentified materials are found,

NETL sends samples to a contracted laboratory to test for RCRA hazardous characteristics (e.g., toxicity, ignitability, reactivity, and corrosiveness).

According to the procedure, the collection occurs each month or as needed. At the collection area, a technician checks the containers for appropriate internal manifests, and the waste may be repackaged into "lab-packs" for purposes of transportation. Wastes are held only temporarily in the collection area until the next pickup by the contracted transporter. Storage on site is less than 90 days for "non-universal" hazardous waste regulated by RCRA. The hazardous waste coordinator assures proper labeling on the waste at the time of pickup by the contracted transporter.

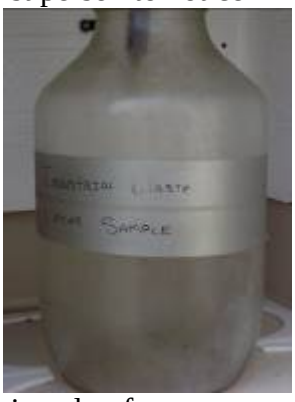
Despite training and the various administrative controls, including the planning that precedes the issuance of a SARS permit, there is always the possibility that someone may dispose hazardous materials down a sink, toilet, or floor drain. It is a violation of NETL procedures to put hazardous materials into sinks, toilets, floor drains, or regular garbage cans. During annual inspections and during periodic walkthrough inspections, ES&H staff visually check garbage cans for evidence of improper disposal practices. To check for improper flushing of chemicals, ES&H staff sample wastewater discharges monthly for metals, various organic compounds, pH, BOD, total suspended solids, and TOC. A full suite of chemical analyses are conducted on wastewater annually. If anomalous readings are obtained during the monitoring of the dedicated laboratory wastewater sewer system, troubleshooting begins. If necessary, ES&H staff will sample fixture traps and drains to locate the source of the chemicals. Spill kits are provided in areas where chemicals are handled. Floor drains are connected to the on-site pretreatment facility, where NETL staff may be able to detain and neutralize any spilled chemicals before release offsite.

Morgantown stores its waste indoors within a specially designated area, which requires a key for entry. Extra spill protection is provided by an epoxy coating on the concrete floor, which drains to sump pumps connected to catch containers. The building is constructed with blast abatement and spill containment features to minimize the potential risks of spark-induced ignition and the spread of contaminants in the event of an explosion or leak. Each class of waste is stored in separate rooms to minimize the chance that a leaked material could come into contact with an incompatible substance and cause a reaction. An employee is assigned to perform daily inspections and keep records of the results. RCRA-required worker training is mandatory for all technicians who collect and handle hazardous waste. The initial training is supplemented periodically with refresher courses. All NETL employees take general awareness training. Those persons who generate hazardous waste in the labs take additional, lecture-based training.

There are no hazardous waste ponds or underground storage tanks for any materials at the Morgantown site. These items were phased out in the past, and

most contaminated soils associated with these items were removed. Currently, there are aboveground storage tanks holding gasoline, diesel fuel, ethanol, and fuel oil. The tanks holding gasoline are visually inspected weekly for leaks. Quarterly interstitial monitoring is performed on the double-walled tanks. NETL installed most of these tanks during the mid 1990s. Aboveground fuel tanks do not require certifications for the State of West Virginia. At the Morgantown site, there are additional aboveground storage tanks designed to hold acids and bases as lab feeds. For the GPDU, there was one tank designated for holding sulfuric acid (H2SO4) at a 93 percent concentration, and there are two tanks designed to hold sodium hydroxide at 50 percent and 20 percent concentrations, respectively. The tanks designed for sodium hydroxide storage were never utilized and have been empty since installation. In 2005 the tanks designated to hold acid were thoroughly cleaned and prepared for decommissioning. The sump water (which consists of rainwater) collected in the secondary containment area associated with these tanks was monitored for pH in the first quarter of 2006. The monitoring results did not indicate any contamination. Therefore, monitoring has stopped, and the rain water is being discharged to the storm water drains.

To deal with the possibility of emergencies, the Morgantown site maintains an emergency response system, including a hazmat team. Several NETL directives specify the response to emergencies. If a spill occurs, the first person to notice the spill has the responsibility to report it immediately to site security. This will initiate an investigation and response that is proportional to the perceived potential threat or risk. NETL personnel who participate on the hazmat team or other response teams are trained to contain and control a spill or cleanup, as warranted. Emergency response drills are conducted annually. Where potentially needed, lab-specific operating procedures specify how to control and shut down various lab activities in the event of an emergency.



During 2006, hazardous waste management inspections continued to focus on proper control of hazardous materials within lab spaces. Any deficiencies were entered into the AIIS tracking system and appropriate actions taken to correct these findings.

On October 30, 2006, the WVDEP Division of Water & Waste Management conducted an unannounced inspection. No areas of non-compliance were found.

6.2 National Environmental Policy Act

The National Environmental Policy Act (42 U.S.C. 4321 et seq., 1969) establishes federal policy for protecting the quality of the environment. The Act establishes three levels of review for federal actions: environmental impact statements (EIS), environmental assessments (EA), and categorical exclusions (CX). Under the highest level of review, an EIS is prepared to evaluate the environmental consequences of any major federal action that might have significant impact on the quality of the environment. The EIS must include a comparative analysis of those realistically

available alternatives that would accomplish the same goals that the federal action is expected to address. Based on the EIS, a record of decision is prepared to document which alternative will be pursued.

If it is not clear from the scope of the federal action that an EIS is necessary, or if the potential for environmental impacts from the proposed action is uncertain, the second level of review, an EA, is prepared. Based on the analysis in the EA, a determination is made that either the potential environmental impacts warrant preparation of an EIS, or the impacts are not significant and a finding of no significant impact (FONSI) can be issued.

If the federal action does not have a significant effect on the environment, either individually or cumulatively, then the third level of review, a CX, is warranted. These types of federal actions can be excluded from an in-depth NEPA review. DOE has determined that certain classes of actions do not individually or cumulatively have a significant effect on the human environment, and might, therefore, be covered by a CX. A list of the CXs, as well as the eligibility criteria for their application, is identified in DOE's NEPA Implementing Procedures (10 CFR 1021).

NETL conducts NEPA reviews for both on-site actions and off-site actions proposed for funding by the federal government. These include actions planned in cooperation with other governmental organizations, educational institutions, and private industry.

The following environmental impact statement activities took place in 2006:

FutureGen
NETL continued an extensive background investigation into the NEPA requirements for the FutureGen Research Initiative which is aimed at creating the world's first coal-based, near-zero emissions electricity and hydrogen production power plant. The 275-megawatt FutureGen plant will employ advanced coal gasification technology integrated with combined cycle electricity generation, hydrogen production, and capture and sequestration of carbon dioxide. On July 28, 2006, DOE issued a notice of intent to prepare an EIS for the proposed action of providing up to $700 million of federal funding for the FutureGen Project.

Western Greenbrier Co-Production Demonstration Project
A draft EIS (DOE/EIS-0361) was prepared for the Western Greenbrier Co-Production Demonstration Project, which would be located in Rainelle, Greenbrier County, WV. This project was selected from a competitive solicitation for Clean Coal Power Initiative demonstration projects in Round 2. The project would involve the construction and operation of a plant using approximately 1,610 tons per day of coal waste from existing gob piles as feed to a circulating-fluidized bed boiler. The demonstration plant would produce 90 megawatts of electricity and generate alkaline product ash to be used to remediate acid mine drainage. Comments were invited from stakeholders on the draft EIS for a period of 45 days after publication of the notice of availability in the Federal Register on December 01, 2006. A public hearing was scheduled for January 4, 2007. DOE expects to issue the Final EIS in 2007.

Orlando Gasification Project

Southern Company Services, Inc. was selected under Round 2 of the Clean Coal Power Initiative to demonstrate a coal-based transport gasifier which has a fuel-flexible design projected to have higher efficiency and lower capital and operating costs than the currently available oxygen-blown entrained-flow gasifiers. The demonstration plant would be built in Orange County, FL, and would generate 285 MW (net) of electricity using sub-bituminous coal. A notice of availability of the draft EIS for the Orlando Gasification Project was published in the Federal Register on August 24, 2006. A public hearing was held on September 13, 2006. The public comment period ended on October 10, 2006, and preparation of the final EIS (DOE/EIS-0383) was initiated in the final quarter of 2006.

Mesaba Energy Project

Excelsior Energy was selected under Round 2 of the Clean Coal Power Initiative to build the Mesaba Energy Project near Hoyt Lakes in the Iron Range of Northeastern Minnesota. The objective is to design, construct, and demonstrate a utility-scale next-generation integrated gasification combined cycle (IGCC) electric power generating facility, which uses the ConocoPhillips E-Gas™ carbonaceous solids gasification technology. The planned installed capacity is approximately 600 MWe (net). DOE participated in scoping meetings held by the Minnesota Department of Commerce on August 22-23, 2006. The state public scoping period ended on August 30, 2006. The draft EIS (DOE/EIS-0382D) is in preparation.

Gilberton Coal-to-Clean Fuels and Power Project

WMPI PTY, LLC was selected under Round 1 of NETL's Clean Coal Power Initiative to demonstrate the Gilberton Coal-to-Clean Fuels and Power Project located in Gilberton, Schuylkill County, Pennsylvania. This demonstration would involve the design, construction, and operation of an integrated coal waste gasification technology and Fischer-Tropsch technology. Using a feedstock of 4,700 tons per day of anthracite coal waste, the project would produce about 5,000 barrels per day of clean liquid fuels (diesel fuel and naphtha) and about 41 megawatts of electricity. DOE issued the draft EIS (DOE/EIS-0357) in late November 2005 and conducted two public hearings in January 2006. Stakeholder comments presented at the public hearings and written comments submitted to DOE during the public comment period which ended February 8, 2006, were addressed as part of the comment-response portion of the final EIS. Specific comments from the Natural Resources Defense Council and others on the CO_2 emission levels from the project resulted in DOE preparing a supplement to the draft EIS. The purpose of the supplement was to correct estimates of CO_2 emissions from the proposed facilities and to provide additional information regarding CO_2 releases and CO_2-related cumulative impacts. DOE expects to issue the final EIS in 2007.

6.3 TSCA

There were no unplanned releases of air pollutants covered by CERCLA or TRI regulations during 2006. Asbestiform fiber concentration air monitoring is conducted annually in Buildings 1, 2, 3, 4, 5, and 7, because asbestos-containing building materials were used in the construction of these facilities more than thirty years ago. No samples taken this year contained fiber concentrations in excess of EPA and State of West Virginia clearance levels (0.01 fibers/cc). Occasionally, fiber concentrations do exceed that limit, but second level analysis has always verified that the excess was caused by higher levels of non-asbestos fibers. The observed concentrations of asbestos fibers have always been below the clearance level.

6.4. FIFRA

There were no restricted-use pesticides, herbicides, or defoliants kept on site during 2006. Only general use pesticides were kept and used for routine insect control. The NETL ES&H Division is not aware of any spills or releases of FIFRA-regulated substances (e.g., pesticides, herbicides, or defoliants).

6.5 Radiation Protection

Because the Morgantown site is not a nuclear facility, it does not have a radiological program of comparable size and complexity to programs found at nuclear facilities. The site does not generate radioactive materials, and it does not transport, process, treat, store, or provide onsite disposal of radioactive waste. NETL does not have an extensive program for protection of the public and the environment from radiation hazards, because its sources are all small, sealed instrumentation sources that are returned to the instrument manufacturer when no longer used. For these reasons the radiological program at the Morgantown site has been described within our regular ES&H (non-radiological) program information. Additional information may be found in Section 4.4 (Atomic Energy Act of 1954), and Section 4.3 (DOE Order 435.1, Radioactive Waste Management).

Non-applicable radiological program requirements for NETL in 2006 include the following:

- Price-Anderson Amendments Act of 1988, as amended in 1992
- USC, Title 10, Part 71, Packaging & Transportation of Radioactive Material
- 10 CFR 834 (draft), Environmental Radiological Protection Program
- 40 CFR 61, Subpart H, National Emission Standards for Emissions of Radionuclide Other than Radon from Department of Energy Facilities
- DOE Order 5400.5, Radiation Protection of the Public and the Environment

- DOE Order 435.1, Radioactive Waste Management

6.6 Air Quality and Protection Activities

The first of three environmental media protection programs is the NETL Ambient Air Quality Program. Significant requirements and responsibilities of this program are listed in NETL Procedure 450.1-1, NETL Ambient Air Quality Management. Under this program, the air quality manager prepares permit applications, obtains permit renewals as needed, and oversees monitoring programs and reporting. Several EMPs have been created which focus attention on a few of the emissions categories or sources where NETL can make the most improvement. To maintain quality control in our program, NETL selects and subcontracts analytical work only to EPA-certified laboratories. These laboratories must submit their QA/QC manuals to NETL for inspection, and the NETL site support subcontractors submit quality control samples (duplicates, blanks, and spikes) to the laboratories to verify the quality of the analyses. Where possible, air emissions monitoring systems onsite are checked or calibrated.

NETL staff began sampling the emissions of TRI-listed compounds in laboratory fume hoods and flues as part of the ISO 14001 efforts. Under EMP 5.5, various devices were employed to sample organic compounds within the ductwork and stacks. These investigations identified the various compounds in the vents and measured the emission rates of these compounds. The results of the hood emissions monitoring activities may be used for a future EMP designed to reduce NETL's emissions as part of the Office of Fossil Energy's pollution prevention goals under TRI. This study aims to determine NETL's current emissions, which previously had been estimated using material balance approaches. NETL annually reports its air emissions inventory as an in-house check on its status as a non-regulated source.

There are several EMPs that direct NETL's continuous improvement efforts in air-quality protection. Two EMPs are designed to reduce emissions of ODS. One seeks to phase out NETL's use of Class I ODS in smaller appliances such as drinking water fountains; the second will replace selected large chillers that air condition large office buildings. A third EMP will reduce emissions of volatile organic compounds (VOC) from paint operations. A fourth EMP deals with vehicles, where the consumption of petroleum products and the emissions of air pollutants will both be reduced.

WVDEP generally evaluates air quality on a county basis, although the regional data may be aggregated into Air Quality Control Region (AQCR) #6, for North Central West Virginia. Monitoring is performed in Morgantown on a daily basis at several sites, and these data are available from the WVDEP website's air-quality index and from the EPA AirNOW webpage. The Morgantown site is not a significant contributor to ambient air quality problems.

During 2006, there were no new source reviews (i. e., Clean Air Act pre-construction reviews) for any Morgantown facility, nor were there any Morgantown facilities with the potential to emit more than 100 tons/year of any designated air pollutant. Until the certificate to operate expired in June 2006, the WVDEP continued to regulate NETL's GPDU as a minor source of emissions affecting NAAQS. The permit limited GPDU operations to a maximum of 1,440 hours per permit year (July 1 through June 30). During 2006, the GPDU did not operate and will be decommissioned. See Table 6.6 for additional information on this permit.

The Morgantown site is not regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP) Program. Nor does the site emit more than 10 tons/year of any single designated toxic air pollutant or more than 25 tons/year in aggregate of all toxic air pollutants, which would otherwise qualify it as a major source requiring regulation under the Clean Air Act for listed toxic air pollutants. Although WVDEP does regulate a number of minor sources of toxic air pollutants, the NETL site has not been regulated in this category. The Morgantown site does not perform nuclear program work and does not have radiological emissions, which would be covered by NESHAP.

6.7 Water Quality and Protection

Surface water protection at Morgantown is controlled by NETL Procedure 450.1-3, *Surface Water Quality Management*, which is administered by the surface water quality manager (SWQM). Generally, this program includes spill prevention, hazardous waste control, and emergency actions, which are addressed specifically in other directives. The surface water program covers permits and monitoring for storm water sewers (which are separate from sanitary sewers) and for construction-related disturbances that potentially increase sediment loads in streams. The applicable directives are supplemented by more detailed instructions that are found in the Storm Water Pollution Prevention Plan, which documents the various potential sources of pollution and the prescribed methods for managing the various types of sources. Under the plan, designated storm water outfalls are sampled twice per year and tested for basic pollutants of concern that might indicate contamination from site applications of fertilizer or leaking sewer lines, Table 6.7.1a, *NPDES Storm Water Monitoring Requirements*. The results of that testing are presented in Table 6.7.1.b, *NPDES Storm Water Analysis Results*. If a spill were to occur, cleanup would commence immediately, and the appropriate outfalls would be monitored, as necessary, for the contaminants of concern. For all water protection programs, quality control in sample analysis is maintained, in part, by choosing an analytical laboratory from a list of EPA-approved laboratories. QA/QC samples are submitted at least annually to further verify the quality of the analytical results.

On the developed portion of the Morgantown site, there are four drainage areas that have rainwater runoff collection systems and regulated outfalls to the nearby surface streams.

- Outfall 002 drains an area that holds the majority of the facilities for material handling and is approximately 509,652 square feet in area.
- Outfall 003 receives drainage from a hillside beside B-17 and drains an area of 43,560 square feet. The permit does not require monitoring of this outfall.
- Outfall 005 drains an area that includes Building 19 (warehouse, machine shop), Building 33 (hazardous materials temporary storage), and various research facilities. It drains an area of 209,088 square feet.
- Outfall 010 drains parking areas, offices and a large section of undeveloped land. It drains an area of 3,197,304 square feet.

The outfalls at the Morgantown site are monitored according to General Permit Registration #WVG610042 under NPDES Permit #WV0111457. Potential sources of spills of petroleum products and oils are aboveground storage tanks, oil-filled transformers and switches, a hazardous waste accumulation facility, and 55-gallon drums stored at several locations (Buildings 5, 19, and 36). Presently there are six aboveground storage tanks that contain petroleum products (diesel fuel and gasoline) and one that contains ethanol, for a total capacity of 2,900 gallons. Three of the aboveground storage tanks are located inside the area drained by Outfall 002. There are two additional aboveground storage tanks located in the drainage area of Outfall 005, and the remaining two are in the drainage area of Outfall 010. Currently the site has 25 oil-filled transformers and two oil-filled switches, all of which have been tested for PCBs. In addition to the tanks of petroleum products and ethanol, there were three storage tanks associated with the GPDU, a project designed to test technologies for removing sulfur gases from hot coal gasification syngas. The GPDU was decommissioned and these tanks were removed during 2005. One 6,000-gallon tank held sulfuric acid. Two other tanks, a 15,000-gallon tank caustic tank and a 5,000-gallon caustic tank, were never used. Because these tanks posed a significant hazard if their contents were released, the storage facility was designed to contain the entire volume of these tanks. There are no buried or partially buried storage tanks at the Morgantown site.

An oil-water separator is installed inside the runoff collection system of the new parking garage, but there are no other treatment systems for storm water at the Morgantown site. Based on previous test results, the primary concern with surface water impacts from the NETL site has been sediment loading.

Sediment loading of surface water runoff affects Burroughs Run along the southeastern margin of the site, West Run along the northeastern margin of the site, and a small stream that traverses the northern portion of the site and empties into West Run. The State of West Virginia has recently launched a program to categorize streams by water quality and to establish minimum water quality criteria for each category. It is anticipated that both West Run and Burroughs Run would be categorized as impaired streams that require the establishment of TMDL limits and further regulation. West Run is highly acidic from mine drainage located on the upper reaches of the drainage basin, and suburban development is increasing within the basin. Burroughs Run drains an area of significant urban and suburban development, which contributes typical urban/suburban pollution (e.g., oil, salt, pesticides, and herbicides).

Although storm water runoff is handled by storm water sewer systems, a completely separate and dedicated sewer system handles the industrial wastewater. A third separate and dedicated sewer system on site handles the domestic sewage. Industrial wastewater quality on site is controlled by NETL Procedure 450.1-4, *Industrial Wastewater Management*, which is administered by the industrial wastewater quality manager. At the Morgantown site, industrial wastewater is that wastewater conveyed from laboratory sinks and laboratory facilities where pollutants other than normal domestic sewage might enter the wastewater stream. The industrial wastewater enters a clarifier located onsite, where the wastewater is sampled monthly. From the clarifier the industrial wastewater enters the onsite domestic sewage lines that empty into the municipal sewers owned and operated by the Morgantown Utility Board (MUB). The discharge is regulated under Pretreatment Permit Number MUB 012. Periodic sampling is performed, and the samples are analyzed by a laboratory chosen from a list certified by the EPA. Discharge monitoring reports (DMRs) detailing monthly sampling and analysis are provided to the MUB, and those reported in 2006 are provided in Table 6.7.1.c. *NETL-Morgantown 2006 Wastewater Effluent Analysis*. The NETL monitoring activities help to enforce the requirement that hazardous wastes are not permitted in the laboratory drains or other drains, except in the trace quantities that normally originate from washing laboratory equipment and glassware. Managers are required to provide suitable containers in laboratories for the collection of materials that are not permitted in the drains. If hazardous materials or petroleum products accidentally spill into the sewer system, NETL must follow the emergency response and notification procedures specified by the Spill Prevention and Control Management and the Comprehensive Emergency Management System directives (NETL P 450.1-5 and NETL O 151.1, *et seq*., respectively). Hazardous waste must be handled in accordance with NETL's directives on this subject. If pollutant concentrations repeatedly exceed permit limits, NETL will initiate surveillance of drains and fixtures that discharge into the industrial wastewater system to identify the source.

Protection of surface water and groundwater requires the prevention of leaks from storage tanks. Accordingly, NETL instituted a program under NETL Procedure 450.1-5, *Spill Prevention and Control Management*, which is under the oversight of the SWQM. As required by the NPDES storm water permit, this program mandates a written spill prevention, control, and countermeasures plan (SPCC) for each site and a

written operations and maintenance plan for each individual storage tank system. Every system capable of contributing to fires, explosions, emissions, or spills of hazardous materials must have written operating plans that address precautions to prevent an emergency and actions to be taken during an emergency. The program manager must identify potential spill sources on site, establish visual inspection programs, generate lessons learned (and program improvements) from past spills, and coordinate the implementation of this procedure with the NETL emergency response activities. There have been no reportable spills of toxic or hazardous materials within the notification period (November 1996 to the present) of the current general storm water permit.

Aboveground storage tanks are visually inspected on a weekly basis and have their interstitial cavity checked quarterly. Visible leaks are corrected immediately. Oil-filled transformers and switches are visually inspected daily. If leaked materials are observed within secondary containment or on the surrounding ground surface, the material is collected or absorbed with spill kits. To the extent practicable, contaminated soil and rainwater are collected and disposed in accordance with regulations. Steel 55-gallon drums are stored in areas protected from rainwater and within a secondary containment. Large spill containment kits are used routinely as a means of secondary containment underneath the drums, and spill kits are kept nearby. The Hazardous Waste Accumulation Facility (Building 33) is designed and constructed to be compatible with the materials stored there and with the conditions of storage. Leaks within this facility will drain to sump areas that have manual sump pumps for collection of liquids. All of the storage area of Building 33 is inside, and the facility is inspected each week. Hazardous materials are not conveyed through underground pipes, with the exception of acid conveyed to the GPDU. The GPDU, however, has been inactive. All aboveground pipe valves are inspected when the associated tanks are inspected. All tank-filling operations must be attended constantly, and offsite personnel are accompanied by NETL personnel when they enter the site for refueling or loading operations.

Emergency containment actions would consist of placing absorbent materials at the source of the spill, at any potentially-affected drains, and at the entrances and exits of culverts. Any contaminated materials collected following a spill would be disposed in accordance with applicable regulations. Spill kits of varying types are placed at numerous locations throughout the site. Personnel and equipment are committed and on standby to respond to spills, and emergency notification procedures are taught to the NETL staff.

Morgantown has only one discharge to the municipal sewer system which is regulated by the MUB (Permit MUB 012). MUB establishes the pretreatment requirements and the effluent standards. Annually, MUB inspects the pretreatment facility plus the sewer connection. When the permit is renewed, MUB requests an update to the description of the industrial wastewater system and the sources of wastewater on site. When the industrial wastewater system is modified or when there is a change in effluent composition, notification is required. MUB may elect to change the monitoring or pretreatment requirements in response to the changes made by NETL. MUB requires monthly sampling and analysis for the parameters listed in Table 6.7.1.c. They require that NETL annually sample and analyze for priority pollutants in accordance with the MUB permit, and MUB conducts an independent sampling and analysis to verify our results. Biological testing is neither required nor performed. MUB requires that the Morgantown pretreatment system have at least a settling clarifier and a pH control system. Industrial wastewater from the Morgantown site could contain chemicals from our laboratories and projects, oil and grease from our motor pool maintenance area, or glycols (ethylene and propylene) from our chiller units (for air conditioning). History has shown that the primary concerns for discharges to the municipal sewer have been trace acids from research projects and alkaline boiler blow-down from the main boiler room.

6.8 Executive Orders

6.8.1 EO 13149 -- Greening Government through Federal Fleet and Transportation Efficiency

EO 13149 compliance for both the Morgantown and the Pittsburgh sites is discussed in section 8.8.1.

6.8.2 EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition

EO 13101 compliance for both the Morgantown and the Pittsburgh sites is discussed in section 8.8.2.

6.8.3. EO 13123 -- Greening the Government through Efficient Energy Management

The Morgantown implementation of EO 13123 is discussed in detail in section 8.8.3.

6.9. Groundwater and Soil Quality Protection Activities

Groundwater protection on site is controlled by NETL Procedure 450.1-2, *Groundwater Quality Management*, which is administered by the groundwater quality manager. This is a program that covers regulatory requirements and best management practices for preventing leaks and spills, monitoring groundwater and soil, removing contaminated soil, and closeout actions. The directive is supplemented by more detailed information and instructions that are

found in the Groundwater Protection Management Plan, which documents the site hydrogeology, various potential sources of pollution, potential contaminants that should be monitored, methods of well installation and sampling, a monitoring strategy, and QA/QC processes related to having water/soil samples analyzed by a contracted laboratory. Maps of the site aquifers and wells are contained in the plan. Under the plan, selected monitoring wells are sampled and tested twice every year for general water quality parameters and for selected chemicals or metals that might indicate contamination from known leaks and spills. Should a spill occur, containment and cleanup would commence, and the affected soil would be monitored as necessary for the contaminants of concern. Highly contaminated soil would be removed, if practical. Alternatively, in-situ treatment would begin, unless the contamination levels were sufficiently low to warrant only monitoring. For all water protection programs, quality control in sample analysis is maintained, in part, by choosing an analytical laboratory from a list of EPA-certified laboratories. QA/QC samples are submitted at least annually to further verify the quality of the analytical results.

The primary strategy for groundwater protection is one of spill and leak prevention. Together, a Spill Prevention, Control, and Countermeasures (SPCC) Plan and a Storm Water Pollution Prevention Plan lay out the strategy for minimizing the risk of unintentional releases and quickly responding to an unintentional release in an effort to minimize environmental contamination. In addition to these efforts, the Morgantown site initiates new projects only after a rigorous ES&H review is conducted in accordance with the SARS directives. As part of the SARS process, the responsible person for each project must prepare a set of written procedures documenting how the project is to be operated, how waste and feed-stocks are to be safeguarded, and how to contain and control unintended releases. When a leak or spill does occur and the environment is threatened, the onsite emergency response team is activated, and the facility makes the appropriate internal and regulatory-driven notifications.

Twenty active monitoring wells exist at the Morgantown site (see Figure 6.9.1). These wells monitor two shallow aquifers within the unconsolidated Lake Monongahela sediments and one bedrock aquifer, the Morgantown Sandstone. None of these aquifers are used as a source of water in the immediate area.

Figure 6.9.2 shows a generalized cross-section through the site and the relationship between the aquifers.

No groundwater contaminants have ever been consistently detected at higher than regulatory levels at the site. Groundwater monitoring at the Morgantown site is focused primarily on past spills and leaks and the effectiveness of the cleanup actions undertaken. The section on CERCLA (Section 6.1.1) lists the past events and the current status of these spill sites.

An informal agreement exists between NETL and WVDEP concerning the Pond 005 site located north of Building 7. The pond collected waste from an experimental fixed-bed gasifier. That site is now a parking lot. When the pond was closed and the area was converted into a parking lot during 1985, the closure was not consistent with the state-approved closure plan. Sampling indicated that low concentrations of semi-volatile organic compounds remained in the soil after removal of the pond liner. The plan called for removal of all the contaminated soil. But after removing many truckloads of soil, NETL decided to forego further removal despite the fact that some contaminated soil remained. NETL then constructed a parking lot on the site. The informal agreement subsequently reached with WVDEP requires groundwater monitoring around the parking lot perimeter. NETL continues to comply with this requirement. Five wells (I, J, L, M, and N) associated with the now-closed Pond 005 and completed in the Lake Monongahela sediments are sampled semiannually for benzene, toluene, ethylbenzene, xylenes, naphthalene, phenolics, cadmium, sulfates, sulfides, and chlorides. Three wells associated with closed Pond 005 (K, L, and N) have detected cadmium at levels above background. However, these have never consistently exceeded the West Virginia limit of 0.005 µg/l in groundwater (see Figure 6.9.3).

During the construction of B-19, coal combustion ash was used as fill beneath the concrete floor slab. After completion of the building, leachate appeared which had the characteristics of acid mine drainage. Installation of collector drains at the footer of the building to collect the leachate and to convey it to a treatment facility that first raises the pH of the leachate into the alkaline range, filters the resulting precipitates from the leachate, and then adjusts the pH to the normal range was the mitigation method employed.

The only contaminants consistently found in significant amounts in the groundwater at the Morgantown site are those related to the application of salts for deicing purposes. Sodium chloride is applied to the parking lots and roads and calcium chloride is applied to the sidewalks and outdoor steps. Wells located near these features and near the runoff routes from these features show significantly elevated levels of both sodium and chloride compared to background levels (see Appendix Tables 6.9.1, Table 6.9.2, and Table 6.9.3. This impact on groundwater is a problem that is shared with many businesses and road maintenance activities in this region, but it is considered a necessary safety practice to prevent injuries to site personnel and visitors.

The overall groundwater monitoring strategy has been to monitor any flow coming onto the site through each aquifer and to monitor the flow after it passes beneath the NETL facilities and moves toward the springs and seeps. Groundwater monitoring at the Morgantown site from 1993 to 2002 was driven by two reasons. The first was the mandate of the WVDEP regarding the closure of Pond 005. The second was the mandate of DOE Order 5400.1, *General Environmental Protection Program*. Although DOE Order 5400.1 no longer exists, samples from a large number of wells

were analyzed between 1993 and 2002 for a lengthy list of analytes. This list of analytes (see Table 6.9.3.) included all organic compounds known to have been detected in analyses of the coal tar waste from the aforementioned gasifier, the Pond 005 bottom sludge, and the sampled soils beneath Pond 005. It also included metals alleged to have been present in the Stretford solution used to remove sulfur oxides in the off-gas from the gasifier. No organic compounds were consistently detected during 10 years of sampling, and no consistent indications of contaminant concentrations above the state limits have been found. Only one analyte (cadmium), traceable to the operation of the closed pond, has been detected.

After 10 years of monitoring, groundwater conditions are well understood. Spills and leaks in the past have not significantly degraded the groundwater on site. The facilities and most of the underlying contaminated soils associated with spills and leaks in the past have been removed. In recent years, operations have changed greatly, and there are now few large projects that could create significant groundwater contamination. At this point, most of the research is bench-scale and uses small quantities of chemicals and solvents. Accordingly, the groundwater analyses have been significantly curtailed. Under the new scheme, wells will be sampled each spring and fall. Wells located around the perimeter of the developed portion of the site in the two shallow aquifers will be tested to check water quality as it enters and leaves the developed area. For the deep aquifer, sampling will continue for one up-gradient well and three down-gradient wells. The original list of measurements and compounds analyzed which was presented in the annual site environmental reports for previous years has been reduced to the list presented in this year's report. The results of the groundwater monitoring conducted during 2006 are presented in the Appendix as Table 6.9.1, Table 6.9.2 and Table 6.9.3. Due to problems with a contracted laboratory, semiannual sampling of the wells was not performed in the Fall of 2005 or the Spring of 2006. Semiannual sampling resumed in September 2006.

7.0 PITTSBURGH

7.1 Site Description

The Pittsburgh site resides within Allegheny County, PA at a location locally known as the Bruceton Research Center. This is approximately 13 miles south of Pittsburgh, PA in South Park Township. It is approximately 60 miles north of Morgantown, WV. Geographically, the facility sits within the rolling hills and steeply incised stream valleys that are tributaries of the Monongahela River. The Pittsburgh site is a partially wooded tract with scattered industrial and office buildings. When the Pittsburgh site was first developed, the immediate vicinity was completely rural. However, the population and housing densities have increased dramatically in recent years as new subdivisions were built nearby.

Immediately west of the site is a low ridge top with a road and scattered houses. Another road with scattered houses borders the north side of the site. The east side of the site is bordered by Lick Run, the Pleasant Hills Sewage Treatment Plant, and a major local road. Housing development is increasing around the boundaries of the site, especially to the southwest, where new homes overlook the site. Commercial zones are found more than three-quarters of a mile away, although some small businesses are located nearby. About 40 percent of the immediately surrounding land is forested, and about 25 percent is pasture or fallow field. Most of the remainder is residential.

With the decline of the steel industry and other manufacturing, the area shifted to retail trade and, more recently, to the service industry. Today the area is widely known for its hospitals and universities. Pittsburgh is still home to a number of large companies such as the H.J. Heinz Corporation, PPG Industries, Bayer Corporation, Alcoa, and U.S. Steel. DOE employs about 510 people at the Pittsburgh site. NIOSH and MSHA employ an additional 502 people, so the entire workforce of the Bruceton Research Center is over 1000. The laboratory is a major employer for the surrounding townships.

7.2 Major Site Activities

Facility Improvements

NETL had been experiencing increasing problems with the water lines that supply all of the potable water for the R&D plateau operations. Problems with this 20-year old system included unpredictable pipe ruptures and inoperable shutoff valves. On several occasions line ruptures caused turbid water to be released into nearby Lick Run, creating an environmental incident. In addition, disruption of the water supply impeded the effective performance of site activities. In 2006, eighty percent of all these water lines were replaced and new isolation valves installed so that future environmental releases from broken water lines will not occur.

An energy management retrofit project in Building 94 continued in 2006. This project integrates six energy conservation measures into the building which include: expansion of the building management system; upgrade of laboratory hoods and installation of laboratory hood controls; installation of variable speed drives on supply air fans; decommissioning of the makeup air system; replacement of two 225-ton Class I CFC chillers with two high efficiency CFC-free 167-ton chillers; and replacement of existing fluorescent fixtures with high efficiency, 3 tube T-8 fluorescent fixtures.

The Building 84 restroom facilities renovations were completed, thereby bringing the building into ADA compliance. Included in this project was a comprehensive upgrade to the heating and ventilation system and renovation of adjoining office space. Ductwork and fire suppression sprinklers were replaced, making the building safer and more energy efficient.

Interior locker room fixtures were repaired and replaced in Building 167. The fixtures included both the showers and the lockers that had deteriorated from the high humidity common to the building. New lockers were installed and painted, and the showers retiled and restored.

The third floor of Building 83 was completely gutted of all structures and equipment in preparation for an upcoming renovation project. The Dewar storage tanks were refurbished, and the nitrogen supply lines were reconditioned and appropriately labeled.

Approximately forty fire doors were replaced throughout the site that were considered a safety risk in the event of an emergency. Several areas in Building 922 had become unsafe due to deteriorated floor tile and exposed carpet seams. A project to replace all the deteriorated and unsafe floor tile and carpeting in Building 922 was completed in 2006.

8.0 COMPLIANCE STATUS

8.1 Environmental Restoration and Waste Management

8.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA Section 120 (40 CFR 300-310; 43 CFR 11) requires federal facilities to comply with the provisions of CERCLA and imposes an additional set of regulations related to site studies and to notices for the sale and other transfers of federal real property. Specifically, this section makes all CERCLA guidelines, rules, regulations, and criteria applicable to federally-owned or -operated

facilities, including: (1) preliminary assessments for facilities at which hazardous substances are located; (2) possible inclusion of such facilities on the National Priorities List (NPL); and (3) remedial actions at these sites. Federal facilities are not required to comply with CERCLA provisions regarding financial responsibility and removal/remediation contracts with state governments. Federal facilities that are not on the NPL still may be subject to state laws concerning removal and remediation actions. However, these state laws and regulations may not impose provisions that are more stringent than those applicable to non-federal facilities. EPA administers the CERCLA program in cooperation with the Commonwealth of Pennsylvania for the Pittsburgh site. The CERCLIS database lists information about the Pittsburgh site, specifically, that the site is not listed as an NPL site. NETL was not listed as an NPL site during 2005 or at any other time in the past.

The Pittsburgh site is listed as "undetermined" on the EPA CERCLA Section 120 List. This is because NETL detected onsite soil and groundwater contamination prior to 1997 and has not been issued a further remedial action plan letter. Each year, including 2006, NETL provides a status report to the US EPA through the DOE Environment, Safety, and Health Program Office. The status report states the following:

> *The site sampling and analysis program has been completed. Remediation for areas of concern was completed during FY 1997. Based on the sampling and analysis, no further significant soil remediation is planned. The human health and ecological risk assessment is in the process of being updated. The current conclusion is that exposure to media at the facility is not expected to generate adverse health effects in onsite or current receptors. Groundwater monitoring continued on a routine basis. EPA has been requested to perform a Docket Review and the Laboratory is waiting on the Docket Status Determination [which is "Undetermined"].*

8.1.2 SARA Title III

SARA Title III requires the reporting of hazardous chemicals present at a facility in excess of certain quantities during the preceding year. This includes solid chemicals designated as extremely hazardous substances in amounts greater than or equal to 500 pounds, liquids in amounts greater than or equal to 55 gallons, or amounts greater than or equal to the threshold planning quantity (TPQ). It also requires reporting of all other hazardous chemicals present at the facility during the preceding calendar year in amounts equal to or greater than 10,000 pounds. Table 8.1.2 lists those chemicals reported by the Pittsburgh site for 2006, commonly known as the Tier II Chemical Inventory Reporting List.

The Pittsburgh site does not prepare a toxic release inventory (TRI) (Form R) because the site does not use, produce, or process any of the listed toxic materials in quantities that exceed the threshold amounts. During 2006, there were no releases that would trigger emergency notification as required by either Emergency Planning and Community Right-To-Know Act EPCRA or CERCLA.

Section 312 of SARA Title III requires NETL to provide an MSDS to the Pennsylvania Department of Labor and Industry, Bureau of PENNSAFE; the Allegheny County Department of Emergency Services; the South Park Local Emergency Planning Commission; the South Park Township Police; the Library Volunteer Fire Department; and the Broughton Volunteer Fire Department for each hazardous chemical and each extremely hazardous substance existing on site at or above the limits. NETL maintains an active inventory of all hazardous and extremely hazardous chemicals on site along with the MSDS for each of these substances. The Pennsylvania Emergency Response Commission, the local emergency planning commission, and the local fire departments have all been advised of all materials, quantities, and their location on the Pittsburgh site.

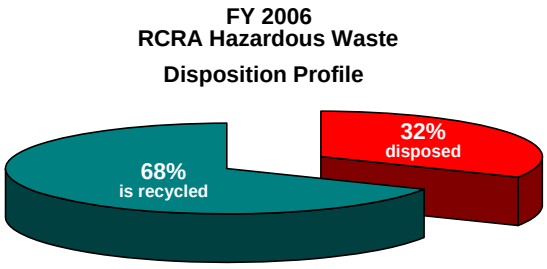
As part of the ongoing commitment to improve emergency planning under the SARA Title III Program, NETL has established targets for reducing the accumulation of hazardous chemicals on site. The intent of these targets is to avoid the unnecessary accumulation of potentially hazardous chemicals in the laboratories while maintaining sufficient chemical stores to complete mission-related research. Year 2002 inventories provided a baseline for the target to reduce the number of containers that contain hazardous chemicals. The number of containers that contain hazardous materials in 2002 was 6600 containers. The objective for this target is to reduce the number of containers by 20%.

NETL achieved a reduction in number of containers by 294 containers over the target, demonstrating the commitment made to reduce the risk posed by such chemicals. The targeted reduction was surpassed because laboratory personnel were encouraged to clean out their laboratories and remove chemicals that were no longer needed. This accomplishment was assisted by an improvement to the program which involved the implementation of a real-time chemical inventory system that enables NETL to submit chemical inventory reports in a timely manner, thus avoiding a time lag in removing chemicals from the inventory list.

8.1.3 RCRA Program

Hazardous waste operations at the Pittsburgh site complied with all applicable federal, state, and local regulations that apply to the handling, storage, and disposal of hazardous waste during 2006. RCRA (42 U.S. Code 6901 et seq.) is regulated through 40 CFR parts 260-271, and the transportation of hazardous waste is regulated through 49 CFR 171-179. The regulations found in 40 CFR 261, Identification and Listing of Hazardous Waste; 40 CFR 262, Standards Applicable to Generators of Hazardous Waste; and 49 CFR 171-179 DOT Hazardous Materials regulations apply to the NETL hazardous waste program.

NETL Procedure 435.1-1B (now P 450.1-9A), *Waste Handling, Storage and Disposal*, is used to implement these regulatory requirements.



PADEP is authorized to enforce the federal and state hazardous waste management requirements at the Pittsburgh site. To help ensure they are current on regulatory requirements, the hazardous waste operations personnel frequently review current waste industry newsletters and bulletins, receive information from the Academy of Certified Hazardous Materials Managers, read NETL's regulatory compliance reviews, and attend the hazardous waste operations training annually, and attend the hazardous materials transportation training every three years.

Pittsburgh is a large quantity generator and has an EPA Large Quantity Generator Identification Number. Although Pittsburgh generates relatively small amounts of hazardous waste during most months of the year, occasional lab activities result in the generation of larger quantities that exceed the threshold for small quantity generators. Hazardous waste is not retained on site for more than 90 days because NETL does not have a permit to store non-universal hazardous waste for a longer period of time. Most waste is shipped in laboratory packs containing combinations of several different compatible chemicals inside a single container.

The Pittsburgh site is not authorized and does not transport hazardous waste. All hazardous waste removed during 2006 was transported by American Environmental Services (AES), Inc. to their storage and treatment facilities. The AES facility combines small packages of similar waste and repackages the waste for more cost-effective shipment to a final disposal facility, which is selected by AES and monitored by NETL. Non-hazardous waste (normal office waste that is not being recycled and cafeteria waste) are transported to a local landfill using commercial waste disposal services.

The amount of hazardous materials and waste removed from the site increased in 2006 over previous years. Pittsburgh generated 6,759 pounds of hazardous waste during 2006. The increase in waste generated can be attributed to clean out operations of various large and small projects this year that are no longer in use and to an aggressive program to reduce the chemical footprint. The latter was done by contacting various researchers to verify that all chemical materials are still needed. Any items that were deemed unusable were disposed. See Section 3.4, Environmental Objectives and Targets, for an explanation of how this quantity was established. This reduction was accomplished using a multitude of reduction efforts. For example, when unused and unopened chemicals were received for disposal, they were offered to other researchers for potential use. Less hazardous or non-hazardous chemicals were substituted for requested

hazardous chemicals when possible. Smoke detectors and batteries were sent to recyclers. Used computers were offered to schools or offered for sale as excess government property.

Design and engineering studies of facility modifications to improve hazardous waste operations were completed in late 2005/early 2006. Design changes included closing two walls of the open building to reduce the impact of weather on the facility. One wall was left open to facilitate ventilation to the building. A new HVAC system was designed for the enclosed north end of the CHF to protect employees from temperature extremes and exposure to hazardous vapors. Also, epoxy sealants were evaluated for use on the building floors to protect against chemical penetration into the building foundation. The chemical storage racks were evaluated and determined to be satisfactory for reuse upon resurfacing.

Liquid wastes are kept in drums. The Pittsburgh site does not have a storage or treatment pond. There are no underground storage tanks in Pittsburgh for petroleum or hazardous waste, and there are no above-ground storage tanks for hazardous waste. No leaks were reported from storage tanks during 2006. Liquid acids and bases are collected monthly at the satellite accumulation areas and are analyzed for acidity.

Waste handling and management personnel ensure regulatory compliance by:

- Weekly walkthrough inspections of the Chemical Handling Facility.
- Monthly pickup at satellite accumulation areas.
- Participation in the SARS process.
- Participation in ERO exercises.
- Training on hazardous waste management.
- Regulatory reviews.
- Attendance at conferences addressing hazardous waste requirements.

Pittsburgh complies with the RCRA hazardous waste manifest requirements before wastes are shipped from the site. The NETL hazardous waste coordinator initiates the documentation and coordinates the completion of the manifest with AES, Inc. and the hazardous waste manager. When AES is ready to ship the waste, the manifest is again checked against the actual shipment to ensure accuracy. All information collected for the manifests, including waste generation forms, waste profiles, and contracts, are retained by the hazardous waste manager, and copies are sent to the ES&H Records Center.

At Pittsburgh, the hazardous waste generators have full responsibility for managing waste that they generate from the moment of generation until the waste is transferred to the waste management organization. The waste generators ensure that all hazardous or potentially hazardous wastes are properly contained and identified at the point of generation. Generators are held accountable for wastes that are not properly contained or identified or are otherwise mismanaged.

Waste handling personnel who collect the hazardous wastes first inspect the container, the labels, and the internal documentation to ensure that the wastes are properly packaged and labeled and that the required documentation is complete and accurate. The waste handling personnel are not allowed to accept or move any hazardous waste without proper packaging, labeling, and identification. The responsibility for identifying the waste rests primarily with the hazardous waste generator.

NETL's hazardous waste manager ensures compliance with applicable regulations by overseeing the entire hazardous waste program. Periodically, the hazardous waste manager reviews the program and brings any deficiencies to the attention of the appropriate individuals or managers. He also ensures the development, accuracy, and submission of the Biennial Hazardous Waste and Waste Minimization Reports to the Commonwealth of Pennsylvania. The manager audits hazardous waste management operations, hazardous waste generators, and TSD facility subcontractors. The manager signs the RCRA manifests and other relevant documentation (e.g., land disposal restriction (LDR) forms, waste profiles, and bills of lading) and maintains the original copy of the RCRA manifests, biennial reports, and certificates of disposal or destruction. The manager ensures that training is provided to employees who require the annual hazardous waste operations and emergency response training (HAZWOPER) so that they may properly perform their duties and responsibilities. Training includes instruction on the proper handling techniques and disposal methods for chemical waste.

8.2. National Environmental Policy Act

Information about all of the NEPA projects that were performed at NETL in 2006 is consolidated into Section 6.2 above.

8.3. Toxic Substances Control Act

Pittsburgh uses more than 100 different materials containing TSCA-regulated substances. Nearly all of these substances are present in very small amounts, either as preservatives for stock chemicals or as chemical reagents used in the laboratories. None of these TSCA-regulated substances are manufactured by NETL, and

consequently, Pittsburgh is not subject to TSCA reporting requirements. No PCBs are kept on site for lab use or as a dielectric fluid inside electrical transformers. Oil-filled equipment is occasionally discovered on site. Since it cannot be ascertained whether it was manufactured after July 2, 1979, it is presumed to contain PCBs at a concentration greater than 50 parts per million. NETL disposed of 149 pounds of such presumed waste in 2006, consisting of capacitors and lighting ballasts (transformers) from construction and maintenance activities.

Table 8.3.1 lists the TSCA-regulated chemicals held at Pittsburgh in quantities greater than 10 pounds.

Asbestos is perhaps the most abundant TSCA-regulated substance retained on site. NETL has never manufactured asbestos, but has used it primarily in building materials that were purchased in prior years. Most is contained within floor tile and floor tile mastic found on the floors of several lab buildings (e. g., Buildings 86, 94, 141, 903, and 920). The remainder is contained in roofs and in laboratory furniture (Buildings 74, 83, 86, 94, and 921). Asbestos located inside buildings is well encapsulated by the matrix material (e.g., floor tiles). Air monitoring has revealed no shedding of asbestos fibers. Asbestos is found on site within some gaskets and inside some lab devices as muffle and tube furnaces. Asbestos abatement activities are discussed above in the section on TSCA remediation activities.

8.4. The Federal Insecticide, Fungicide, and Rodenticide Act

There were no restricted-use pesticides, herbicides, or defoliants kept or used on site during 2006. Only general use herbicides were kept and used for routine vegetation control along fence lines, guard rails, and flower beds. This included Prosecutor Pro®. A commercial pest control company provided integrated pest management services in the cafeteria and in and around the daycare center. Talstar® crystals are spread on the grass to control insects. Demand® is used in the cafeteria and at the daycare center on door thresholds and window sills to prevent insects from entering the building.

8.5. Radioactive Materials

Use of radioactive materials at NETL is limited to research instrumentation that contains sealed radioactive sources (see Table 8.5.1) and radiation-generating devices (see Table 8.5.2). NETL does not generate, process, or treat any radioactive material, and it does not have on site any temporary or permanent facility for radioactive waste disposal. An inventory of radiation sources is actively maintained and monitored by the radiation safety officer. Information is retained about the item, isotope, quantity, custodian, location, status, and sealed source activity. Title 10 CFR 835.901(e), DOE Policy 441.1, and NETL Procedure 440.1-17 are the applicable regulations and requirements. In addition, best management practices include DOE implementation guides, EPA information, NRC information, and Commonwealth of Pennsylvania recommendations and requirements. All of the radioactive sources are sealed and are used in instrumentation. The site support contractor has the required NRC license for the three Ronan Engineering Company level density gauges. Pittsburgh has two

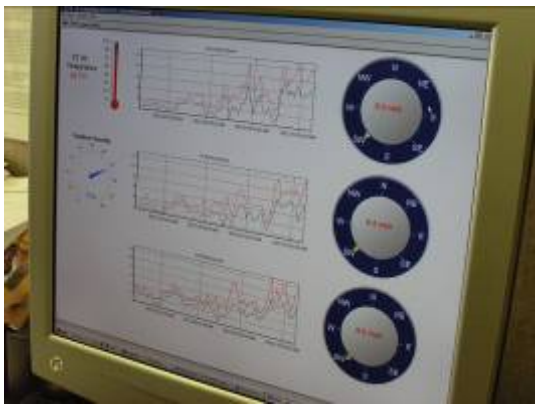
sealed source electron capture devices that are licensed through the manufacturer. In total for the site, there are ten radiation-generating devices in six radiological control areas at Pittsburgh. The five devices described above use radioactive source materials, and the other five are in instruments that produce X-rays. These instruments include two scanning electron microscopes, an electron spectroscopy chemical analyzer, an X-ray diffraction instrument, and an X-ray scanner in the mailroom.

Radiation monitoring performed at Pittsburgh consisted of body TLD and finger rings for the employees in the mail facility. In addition, there are specific radiological control areas which have dosimeter badges continually displayed. Leak testing was performed every 6 months on all applicable sealed sources. None of the testing or monitoring detected any radiation leakage or exposure problems during 2006.

8.6. Air Quality and Protection Activities

The NETL Ambient Air Quality Management Program is concerned with protection of outdoor air quality. This includes the applications for air emissions permits that allow NETL to conduct research into the science of reducing air emissions. The program is regulated by the ACHD, which is authorized to administer Title V permits under the Clean Air Act Amendments.

The air quality manager prepares permit applications, obtains permit renewals as needed, and oversees monitoring programs and reporting. Air emissions are reported annually in accordance with the three air permits maintained at the site. One permit (#7032056-000-00500) is for a 4,500,000-Btu/hr Cleaver Brooks natural gas-fired boiler located inside Building 922. The second permit (#7032056-000-00501) is for three RayPak finned copper tube boilers located inside Building 922, each having a 1,630,000-Btu/hr input rating. The third permit (#7023056-000-00800) is for the 500-lb/hr gas- and coal-fired research unit located inside Building 86.



The site was designated as an administratively synthetic minor source by the ACHD, and this designation continued through 2006. A synthetic minor source is a source that accepts an emissions limit that allows it to remain outside of the federal permit program. It is any source that has its emissions administratively limited below certain thresholds by means of a federally enforceable order, rule, or permit condition. A synthetic minor source site pays a fee for the work involved in establishing the order, rule, or permit condition. After the synthetic minor source determination is complete, the source then becomes a registered source with the agency. An administratively synthetic minor source must have a completed application form; a written certification signed by a responsible official; a fee deposit sufficient to cover the estimated costs to the Division of Air Quality to review, evaluate, and act on the application; and submittal

of sufficient information to ACHD. The designation provides interim permitting under Title V, pending final approval of the permit by ACHD.

This designation provides full compliance with Title V of the Clean Air Act. For the Pittsburgh site, three R&D combustion units follow operating requirements as outlined in the Title V application submitted to Allegheny County. Although not yet permitted under Title V, Allegheny County requires NETL to follow the limitations submitted in their application. NETL has never exceeded these operating limits.

The model used by the ACHD, Bureau of Environmental Quality, Division of Air Quality to calculate air emissions is based on fuel usage and provides worst-case emissions estimates. This model takes into account the type and quantity and the total burn time of the fuel to determine the estimated emission level. The results of this modeling are summarized in Table 8.6.1. Several of the largest combustion units at the Pittsburgh site are now in the planning process for decommissioning and demolition. These units are the 500-lb/hr Combustion Unit and the Combustion and Environmental Research Facility (CERF). The third large unit is the flexible Modular CO_2 Capture Facility (MCCF), which is now in a mothballed/inactive state. Due to the size of the MCCF's combustion capabilities, the Pittsburgh campus will remain a Title V synthetic minor source.

In years past, the three large units contributed the vast majority of site emissions. Other operations that still contribute site emissions include: the Raypak boilers in Buildings 58, 84, 900, 920, 921, and 922; three Kewanee boilers in Building 84; two Weil McLain boilers in Building 74; three Patterson Kelley boilers in Building 94; unpaved roads (a source of particulates); and paved roads. -

NETL is not required to perform continuous air monitoring to determine emission levels and is in compliance with all permit requirements for the 500-lb/hr Combustion Unit and for the boiler air emissions permits. There were no NOVs and no unplanned air emissions during 2006.

NETL actively participates in a program for a reduction in the use of Class I ODSs. This program aims to recover and reclaim chlorofluorocarbon refrigerants from HVAC equipment for subsequent reuse. The inventory of ODS-containing equipment on site is steadily decreasing. Older ODS-containing equipment is being replaced, and the use of Class I ODSs is being phased out for the HVAC equipment. For example, water fountains that contained Class I ODSs in their chiller units continued to be replaced across the site during 2006. Systems and appliances with environmentally-friendly substitutes are being used to replace the Class I ODS-containing systems and appliances.

The site maintains three 30-foot meteorological towers that monitor temperature, relative humidity, precipitation, wind speed, and wind direction. The towers are not used for emissions monitoring. Data are collected twice per week for use by the site's

HVAC programs, for providing critical meteorological information to the ERO during emergency situations, and for providing meteorological information used in the models for the air emissions program.

8.7. Water Quality and Protection Activities

The topography of the Pittsburgh site is comprised of rolling hills that separate the natural flow of water on the site. In addition, NETL has separated many of the activities performed on the site. Consequently, the surface water quality and protection program is essentially divided into two distinct areas. One area is located south of Wallace Road, and the other is located north of Experimental Drive. The northern area houses all of the laboratory and process facilities for the DOE portion of the site. The southern side primarily houses administrative, project management, and contractor maintenance operations.

The site is staffed by ES&H professionals who review site activities to ensure that the site does not contaminate storm water, industrial wastewater, or sanitary wastewater discharges. All onsite research projects and support activities are reviewed by ES&H staff as part of the SARS process for possible impacts on air, surface water, groundwater, and soil. Applicable federal, state, and local regulations potentially affecting these activities are reviewed, and compliance is ensured before approval to operate is given by the ES&H staff.

Laboratory wastewater from the northern area is routed to the WWTF located in Building 74. All treated industrial wastewater, which consists of laboratory and process wastewater from the site's R&D operations, is regulated by the Pleasant Hills Industrial Sewer Use Permit Program. Treatment in the WWTF consists of flow equalization with subsequent pH adjustment by adding caustic soda or ferric chloride. Metals and particulates are removed by agglomeration in the flocculation tank coupled with solids separation in the plate separator, and final removal of the metals and particulates occurs in the filter press. An activated clay/activated carbon filtration system provides additional removal of organics and metals from the treated wastewater prior to discharge into the sanitary sewer. The effluent can be re-circulated from within the effluent monitoring tank immediately prior to discharge into the sanitary sewer. This recirculation is pH-driven. If the pH is outside the allowable range (between 6 and 9), a diverter valve automatically opens, which allows the off-specification treated effluent to be re-circulated within the system for additional treatment until the pH has been brought back to within requirements. Final effluent pH adjustment occurs in a chamber inside the effluent monitoring tank prior to discharge into the sanitary sewer system. Treated industrial wastewater effluent from the site's WWTF is then routed to, and given final treatment in, the Pleasant Hills Sewage Treatment Plant.

The Pleasant Hills Authority (PHA) issued the current Industrial Sewer Use Permit to NETL on December 28, 2001. Conditions placed on NETL by the permit limit the quantity and quality of effluent constituents (free cyanide, phenolics, mercury, copper, chloroform, and pH) that may be discharged into the wastewater. The permit requires NETL to submit all wastewater analysis data for the treated wastewater effluent discharged through the WWTF to PHA's consulting engineering firm, Gannett Fleming, Inc., semiannually. Table 8.7.1 contains the results of the 2006 monitoring. During this semiannual sampling, PHA conducts sampling and analysis independently. NETL also provides the PHA with the monthly sampling analysis at their request, although these data are not required by the permit.

In addition, NETL is required to prepare an annual wastewater report that contains no analytical data, but rather summarizes information about the site's industrial wastewater discharge, including the volume of wastewater discharged, the number of site employees, the type of waste discharged, and the type of pretreatment performed.

Table 8.7.2 provides the industrial wastewater treatment facility effluent sampling results taken at the WWTF during 2006. There were no permit exceedances in 2006.

The southern area does not have and does not need an industrial wastewater sewer system separate from the sanitary sewer system that drains to the Clairton Municipal Sewage Treatment Plant, because there are no laboratory operations on the south side of the site.

Pittsburgh's sanitary sewage from the northern area is combined with sanitary sewage from the other major federal agency on the site, CDC/NIOSH. This sanitary sewage discharge is separate from the discharge of the treated laboratory/process wastewater.

In addition to the sampling and analysis performed by NETL and CDC/NIOSH, PHA conducts independent sampling and analysis of wastewater effluent from all these locations. This information is used by the PHA to determine whether any discharges of the treated effluent were in excess of the local limits and required the issuance of a NOV.

The Mine Safety and Health Administration (MSHA) is the other federal agency sharing the environment of the Bruceton Research Center. MSHA is also located on the northern area and has a separate sanitary sewer line from the NETL and NIOSH sub-interceptor discharge that is positioned on the north side of the site. The MSHA sanitary sewer line discharges directly into the South Park (PA) main sanitary line. The NETL/NIOSH sub-interceptor sanitary sewer line also discharges into the South Park main sanitary line, but at a point much closer to the PHA WWTF.

All NETL sanitary sewage from the southern area is routed to, and treated in, the Clairton Municipal Sewage Treatment Plant.

Storm water (surface water) runoff from the 69-acre NETL northern portion of the site exits the site through the northern storm drainage system, a dedicated storm water system that drains directly into nearby Lick Run. This discharge occurs at the NPDES-permitted North Outfall (001). Lick Run is a small natural stream that flows along the eastern boundary of the 238-acre Bruceton Research Center. Contaminants to the storm water effluent are regulated by an NPDES storm water discharge permit. The contaminants consist of air conditioning condensate, runoff from various impervious surfaces into the site storm sewers, and treated acid-mine drainage from a research coal mine operated by CDC/NIOSH. There was a single reportable release into this permitted system during the year that required NETL to notify PADEP. This single reported release involved a potable water line break on January 4, 2006 that released turbid water into Lick Run.

Storm water collected from the southern side of the site exits through the southern storm drainage system, a dedicated storm water system that enters Lick Run through the NETL NPDES-permitted South Outfall (002). NETL is required to monitor and report the results for the two site storm water discharge outfalls on a quarterly basis, although there are no discharge limits established for this discharge.

Storm water discharged from the northern side of the site is regulated through a NPDES permit issued to NETL, NIOSH, and MSHA. Storm water discharged from the southern side of the site is regulated through a NPDES permit issued to NETL only. Table 8.7.3 provides the storm water North Outfall monitoring results for flow, suspended solids, carbonaceous biochemical oxygen demand 5-day test (CBOD5), oil and grease, aluminum, iron, manganese, lead, mercury, pH, and ammonia. Table 8.7.3 also provides the storm water South Outfall monitoring results for flow, suspended solids, aluminum, iron, manganese, lead, pH, and ammonia.

8.8. Executive Orders

8.8.1 EO 13149 -- Greening Government through Federal Fleet and Transportation Efficiency

EO 13149 established a policy to ensure that the Federal Government exercises leadership in the reduction of petroleum (gasoline and diesel) consumption. It is the EO in force throughout 2006 and the policy followed throughout NETL in 2006. *EO 13149* required improvements in fleet fuel efficiency and increased use of alternative fuel vehicles (AFV) and alternative fuels. NETL won an award from the Department of Energy, Office of Energy Efficiency and Renewable Energy, FreedomCAR and Vehicle Technologies (FCVT) Program for exemplary performance in achieving the goals of EO 13149. NETL has also won an award for demonstrating leadership reducing petroleum consumption in the federal transportation sector.

The goals established by this EO and the results achieved in 2006 by Morgantown and Pittsburgh is:

- Reduce the entire vehicle fleet's annual total fuel (diesel and gasoline) consumption by at least 20% by the end of FY 2006, compared to FY 1999 levels:

  NETL consumed 20,021 gallons of petroleum fuel through the vehicle fleet in 2006. In 1999 NETL consumed 29,602 gallons of total fuel. Thus, NETL realized a 10% reduction in petroleum fuel consumption.

- Increase the use of AFVs and alternative fuels to the extent practicable and consistent with the agency's mission. Hybrid electric vehicles should be considered by each agency. Each agency should fulfill the AFV acquisition requirements of *Section 303 of the Energy Policy Act of 1992*. NETL should acquire AFVs as 75% of total light duty vehicles. Alternative fuels should provide the majority of the fuel consumed in these vehicles by the end of FY 2005:

  NETL consumed 21,546 gallons of alternative fuel compared to 21,021 gallons of petroleum fuel in 2006.

8.8.2 EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition

The recycling program as implemented in Morgantown consists of utilizing a site support services contractor (PACE Industries) for pickup and packaging of the recyclables. The offsite recycling vendor removes the recyclables from a central location and disposes of them via local recycling outlets. The present recycling vendor was engaged at the completion of a recycling vendor contract period. It was desirable to utilize the services of a vendor local to the Morgantown area if possible to support the local economy. The qualifications of the present vendor, Edwards Document Destruction & Recycling, were approved by the MGN recycling contracting officer's representative. The site pays for recyclables pickup on a per event basis.

The recycling program as implemented in Pittsburgh uses the site support contractor to transfer, approximately once per month, the recycle bin contents into large cardboard boxes (gaylords) for pickup by the site's recycling vendor. Historically, the recycling vendors for the Pittsburgh site have been selected competitively on a yearly basis by issuing a bid package (in December) with the individual recycle streams (e.g., mixed paper, magazines, newspapers, and aluminum cans) listed with a space for the potential vendor to insert a dollar amount that they will pay the site for the

recyclables. To date, two vendors have stopped picking up recyclables partway through the year. After an extensive search, a vendor, Pittsburgh Recycling Services was found to provide recycling services for specific waste streams created at NETL. An agreement between NETL and the vendor the site pays for recyclables pickups and receives no money in return.

This vendor will pick up #1 & #2 plastics, which some other vendors would not accept. In addition, hard cover textbooks and catalogs can be recycled rather than thrown away as was the case previously.

Pittsburgh has recently implemented a "recyclables sorting" effort that has added several metric tons (tonnes) of recyclables to the recycle stream while removing the same amount from the waste stream. Employees who are cleaning out offices because of retirement, relocation, or just as part of general housekeeping are provided with large, wheeled bins into which they can dump all their unwanted office supplies. The bins are subsequently taken to the recycling building where appropriately trained support service contractor employees remove the recyclables from the bins for placement into the proper recyclable receptacles. On average, large bins containing approximately 200 – 350 pounds of unwanted office supplies usually contain approximately 30 – 50 pounds of un-recyclable trash.

EO 13101 also establishes a general approach and goals for affirmative procurement activities by federal agencies. The stated goal is to increase and expand the markets for recovered materials through preferential purchasing, consistent with the agency's need for efficiency and cost effectiveness of operations. It directs each agency to establish an affirmative procurement program. Affirmative procurement means the purchasing of goods and services that have a less adverse impact on the environment throughout their life cycle and that are reasonable for the government to purchase. Results must be tracked and reported. The goal is 100 percent procurement of goods normally used at a site that meet EPA guidelines, except for those products for which written justification is given for avoidance. The EPA must designate items that meet this requirement in their Comprehensive Procurement Guideline. Onsite recycling goals for each agency are to be established progressively for years 2000, 2005, and 2010.

NETL implements this EO, in part, with NETL Procedure P 541.2-1B, *Affirmative Procurement Program*. This program makes employees aware of the opportunities for purchasing products designated by the EPA for recycled content. Government credit card purchases are monitored for compliance, and metrics are tallied each year for purchases by the warehouse and others.

NETL takes a two pronged approach to this program. The first prong establishes a program of affirmative procurement through the warehouse. The warehouse purchases and distributes common supplies (e.g., office materials) to the sites. The second prong is based on continuous training of the professional purchasers and the government credit card holders to make the affirmative choice when

purchasing. The trust placed in the purchasers is not blind – the purchases are monitored.

One or more lists of green products are produced and made available on the NETL Intranet. When items are needed, the prospective buyer is encouraged to first determine whether used or excess items are already available on site (Intranet-based lists of office supplies, furnishings, tools, chemicals, etc.). If not, the prospective buyer is encouraged to obtain the items from the warehouse, which stocks green items. As a last resort, the prospective buyer can directly purchase the items. Recent enhancements to the small purchase system software require prospective buyers to provide justifications if they choose to buy non-affirmatively.

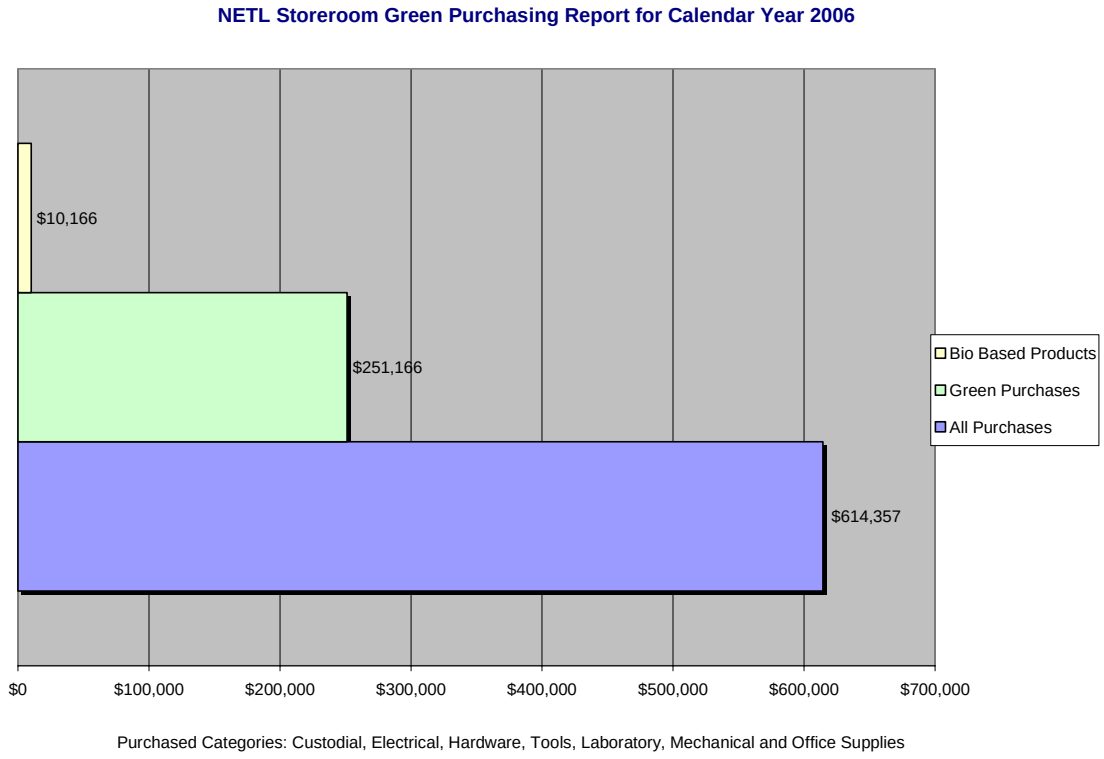


Figure 8.8.1 – NETL Storeroom Green Purchasing Report for CY 2006

The purchase of green items is a function of availability and demand, as shown in Figure 8.8.2. During FY 2005, NETL achieved the goal of purchasing 100 percent green items for the NETL storeroom.

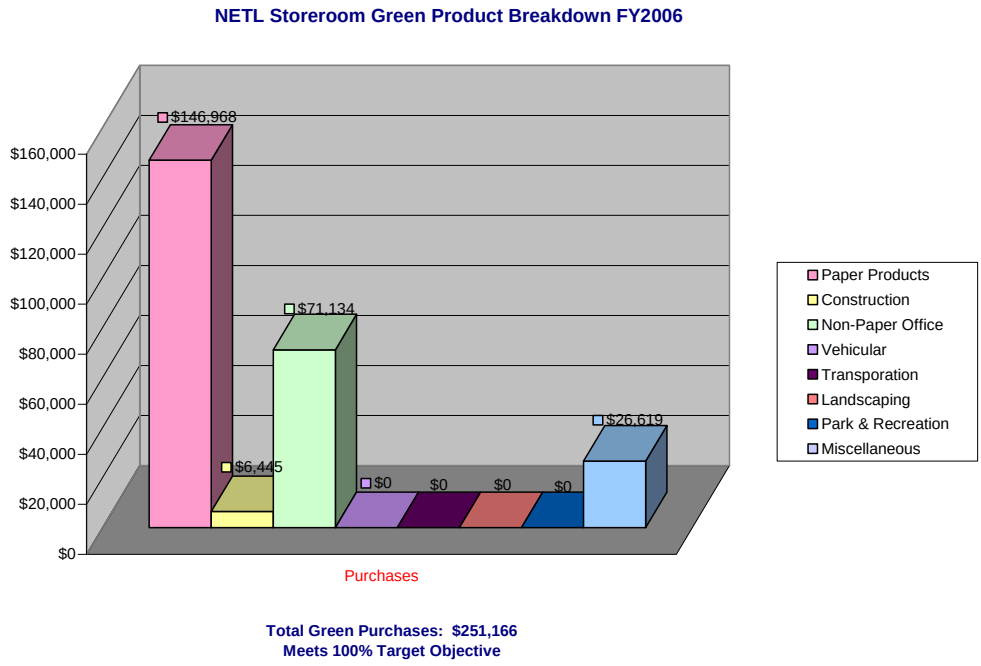


Figure 8.8.2 – NETL Storeroom Green Product Breakdown

8.8.3 EO 13123, Greening the Government through Efficient Energy Management

2006 is the final year for *Executive Order 13123*, and so most of the focus directed toward efficient energy management involved the strategy to be used to implement *EO 13423*. *E.O. 13423* requires sweeping changes to the NETL energy management program and will be discussed fully in the NETL 2007 Annual Site Environmental Report. NETL is aggressive in providing the most energy efficient management of facilities possible. For example, lighting retrofits are now a routine part of all construction/renovation packages where inefficient fixtures are replaced with more efficient 277-volt Energy Star-rated electronic ballast fluorescent fixtures. Motion sensors have been installed to conserve energy in areas without constant use. NETL has incorporated energy efficient designs and energy star equipment into construction packages, remodeling, and maintenance projects.

Beginning in 2006, Public Law 109-58, Energy Policy Act of 2005 (EPact05), establishes new performance objectives for the Federal Government that includes energy intensity, procurement of energy efficient products, energy savings performance contracts, federal building performance standards, renewable energy procurement, and guidelines for the use of photovoltaic energy in federal buildings. It specifically applies to ``the [f]ederal buildings of [NETL] (including each industrial or laboratory facility) so that the energy consumption per gross square foot of the [f]ederal buildings of [NETL] in fiscal years 2006 through 2015 is reduced, as compared with the energy consumption per gross square foot of the [f]ederal buildings of the agency in fiscal year 2003."

The Department began updating *DOE Order 430.2a,* Departmental Energy and Utility Management, in 2006 to reflect these new performance objectives. NETL was directed to follow the current active DOE Oder 430.2a, where applicable, and to meet or exceed EPact05 objectives until the new order is approved for release. One of the EPact05 energy intensity objectives establishes a 2% reduction in energy use per year. This reduction is to be increased each subsequent year from FY2006 through FY2015, for a total reduction in energy use per gross square foot of building space of 20% by FY 2015.

Consistent with *EO 13123* and *EPact05,* NETL's Comprehensive Energy Management Plan has been updated to include strategies and annual implementation steps to insure compliance. The plan includes the requirements of *DOE O 430.2a* and an energy curtailment plan for use in the event of emergencies. As a part of the decision-making about whether to undertake certain projects and investments, NETL undertakes life-cycle cost analyses. These analyses have been used primarily for equipment replacement projects, especially HVAC system replacements. Often, these analyses indicate the optimal time to undertake a retrofit project during the life span of equipment or facilities. To further guide the decisions about priorities for energy efficiency improvements to the infrastructure, NETL, during fiscal year renovations, conducts specific construction project energy audits.

Under *EPact05* NETL reclassified all of its facilities in Albany, Morgantown, and Pittsburgh as buildings. In FY 2006 NETL was able to achieve the *EPact05* total of a 2% reduction in energy consumption per square foot of building use. This was determined using the base year FY 2003 energy use of 231,732 Btu/sq.ft. During FY 2006 energy use was 167,435 Btu/sq.ft., achieving a reduction of 27.75 percent. This significant reduction in energy intensity was assisted by the Pittsburgh procurement of 100% of its natural gas needs from a local landfill gas site. This natural gas source is obtained through the natural gas utility supplier. The DOE Office of Federal Energy Management Program has identified landfill natural gas usage as a renewable energy source.

EPact05 does not define a goal for greenhouse gas reduction and, therefore, the goal established in *EO 13123* is generally applicable. *EO 13123* defines the goal as a 30% reduction in greenhouse gas emissions as compared to the FY 1990 baseline year. *E.O. 13123* defines greenhouse gas as CO_2 only. NETL has received clarification from the DOE Federal Energy Management Program that allows credit for a reduction in greenhouse gas through the use of landfill gas. This was permitted because using landfill gas reduces methane emissions, which are considered to be more environmentally damaging than CO_2 emissions. In FY 2006, NETL greenhouse gas emissions were 48,082,490 lbs of CO_2. Using the 1990 baseline of 67,849,829 lbs of CO_2 equates to a 29.134% reduction in 2006. The success in reducing greenhouse gas emissions has been achieved by a

reduction in electricity, natural gas, and steam use combined with the credit for using landfill gas.

NETL has reduced consumption of petroleum products primarily through the use of ethanol and natural gas in alternative-fueled vehicles. DOE defines petroleum products as oil, gasoline, diesel fuel, LPG, and propane. NETL does not typically use petroleum products for heating buildings. Only forklifts, front-end loaders, snow-removal equipment, and lawn care equipment use petroleum products, which are primarily fueled with gasoline and diesel fuel. Alternate fuel systems have been installed at both Morgantown and Pittsburgh. These alternative fuel systems include ethanol-85 and compressed natural gas (CNG) vehicle refueling stations. As of the end of FY 2006, the NETL ethanol-85 refueling stations are operating at both Morgantown and Pittsburgh. Only the CNG facility at Pittsburgh was operating, while the Morgantown CNG facility remained under construction. The ethanol-85 and CNG facilities are helping NETL meet the alternate-fueled vehicle goals as defined in *E.O. 13223*. Please see Section 8.8.1. for more information about the NETL alternative fuel vehicles program.

8.9. Groundwater, Soil Quality, and Protection Activities

The Pittsburgh site Figure 8.9.1 is located within the Appalachian Plateau physiographic province. The topography, consisting of rolling hills and ridges, reflects the dendritic drainage erosion of the uplifted Allegheny Peneplain.

All rocks in the area are of sedimentary origin. They are almost exclusively of Pennsylvanian or Permian Age, with the exception of alluvium in the stream and river valleys, which is of Quaternary Age. At the Bruceton location, bedrock is of Pennsylvanian Age and belongs to the Monongahela and Conemaugh Groups. The contact is identified by the Pittsburgh Coal, which is the basal member of the Monongahela Group (see Figure 8.9.2).

The Monongahela Group forms the tops of the hills on the site and consists of cyclic and interfingering sequences of shale, limestone, sandstone, and coal. Two prominent coal beds, the Redstone Coal and the Pittsburgh Coal, outcrop onsite. The Pittsburgh Coal, however, has been heavily mined and very little remains. The resultant mine voids and their possible effect on groundwater are subsequently discussed.

The Conemaugh Group is exposed lower on the hills and in the valleys of the site. The upper member of this group is the Casselman Formation and consists of thinly bedded limestone interbedded with calcareous, variegated shales and sandstone.

In the Pittsburgh geologic quadrangle, there are two major anticlines and two major synclines. The axis of one of the anticlines, the Amity Anticline, trends northeast to southwest and passes just southeast of NETL. As a result, rock units under the site dip gently to the northwest at about a 10° angle. Locally, minor folding and faulting also occur.

Groundwater in the region is known to occur in unconsolidated deposits in stream valleys and in fractures, pore spaces, bedding planes, and solution channels in consolidated rock layers. No water-bearing zones have been encountered in overburden soils during previous drilling on NETL property.

The shallowest aquifer on NETL property is found in the weathered bedrock just below the rock/soil contact and occurs over most of the site, except where it is undermined. Recharge of this unit occurs where rainfall percolates downward into the weathered strata until a continuous horizon of low vertical permeability (unweathered bedrock) is encountered. There are a total of 19 wells screened in shallow weathered bedrock; 7 are located in the Main Plateau area and 12 are in the Valley Fill area. Figure 8.9.3 and Figure 8.9.4 show the locations of the monitoring wells.

A deeper, water-bearing zone has been noted at NETL at the contact between the Connellsville Sandstone and the Clarksburg Clay and Limestone. There are a total of 4 wells screened in this deeper zone (located in the Main Plateau area). This deeper aquifer had extremely low yield in the Valley Fill area.

Four wells (2 at the Main Plateau and 2 in the Valley Fill area) were originally screened in the depth interval between the two aquifers, within fractured strata. These wells had extremely low yields and were subsequently abandoned. The minimal amount of groundwater occurring in this intermediate zone is probably the result of leakage from the overlying shallow, weathered bedrock zone.

The Pittsburgh Limestone, with its interbedded shales, is generally impermeable except where weathered, fractured, or where bedding plane separations have been formed by solution. Onsite monitoring wells installed in the Pittsburgh Limestone formation have had highly variable water production. Weathered or fractured portions of this unit have been capable of supporting submersible pumps, and a spring emanating from a limestone outcrop in the bed of McElhaney Creek flows freely and constantly year round. Conversely, where the unit is unweathered or exhibits poorly developed fracture zones, yields have been very poor.

Although the Connellsville Sandstone has been reported to yield up to 25 gallons per minute in some southern portions of Allegheny County, previous on-site drilling into the upper Connellsville revealed it to be shaley and relatively unproductive. However, the lower Connellsville at the contact with the Clarksburg group was very fractured, and at some locations it exhibited water-filled voids.

The Lick Run Valley, which borders the eastern edge of the Pittsburgh site, is made up of silt and sand alluvial deposits. The alluvial deposits comprise a water-bearing unit, which discharges to form the stream baseflow within Lick Run. Although shallow piezometers have been established in these deposits, the thickness of this water-bearing unit is unknown.

The vast majority of domestic water supplies for the area surrounding the Pittsburgh site are provided by the Pennsylvania American Water Company, which processes water from the Monongahela River. There was, however, at least one groundwater well listed for domestic usage within a one-mile radius of the site. This well, situated near central Bruceton, was 140 feet deep and was completed in the Monongahela Group, according to the computerized PADEP Water Well Inventory. Upon topographic review of the well's location based on reported longitude and latitude, it was possible that this well was in fact completed in the Conemaugh Group due to the reported depth of the well. The well is located to the north of the Pittsburgh site, so it should not be affected by NETL groundwater impacts, because groundwater is assumed to flow in a southerly direction beneath the Lick Run Valley. There has been a report of a domestic water well on Piney Fork Road (approximately 1-1/2 miles south of the Pittsburgh site), but this well could not be located or confirmed by preliminary physical exploration and was not included on the water well inventory.

The PADEP Water Well Inventory reported no other domestic wells in Jefferson Borough or South Park Township. It should be noted, however, that the inventory does not list those wells that may have been drilled prior to 1966.

There are two groundwater flow patterns at the Pittsburgh site. Groundwater flowing in the shallow, weathered bedrock aquifer may percolate along the soil/bedrock interface and/or along near-vertical stress relief fractures and follows the general site topography, flowing from the tops of hills on the site, generally perpendicular to ground surface elevation contours. This flow is directed by the intervening valleys toward the Lick Run Valley, where it joins the water-bearing unit located in the valley and adds to the base flow of Lick Run itself. Some of this flow also discharges as springs on the hillsides or in the valleys.

The second flow pattern is associated with the deeper aquifer. Groundwater in this zone generally flows east towards the Lick Run Valley, where it commingles with water of the shallow zone as it flows off the hillsides.

The Pittsburgh Coal seam outcrops throughout the Pittsburgh site and underlies a small portion of NETL property, particularly the Building 167 area. The coal outcrop can be seen in the hillside above the main plateau area. The 900 and 920 areas are built on fill very near to where the coal probably outcropped, but the seam probably has been removed by crop mining or stripping during construction.

The Pittsburgh Coal has been extensively mined since the beginning of the 20th Century, and is mined out in the area, except for remaining roof support pillars and a small working portion of the on-site experimental mine. The coal seam, as with the other strata, dips to the northwest at an approximate 10° angle. Near the eastern boundaries of the site, the top of the coal is located at an elevation ranging from 1015 to 1020 feet above mean sea level. The dip is such that the top of the coal is found near 990 feet above mean sea level at the western end of the site.

The coal seam and associated mine workings have influence on groundwater at those locations underlain by them. Fracturing of overlying strata and actual roof collapse has created conduits that act to dewater the overlying rock. This is the case at Building 167 (and the adjacent triangle parking lot) where the shallow, weathered bedrock zone was dry. Also, the voids created during mining leave open conduits that allow water to flow down freely, possibly exiting at old portals. Mining may have removed underlying fireclays usually associated with the bottom of coal seams, opening up the possibility for downward migration of water into the underlying rock. For these reasons, special attention will have to be paid to the coal seam and its relative position to areas of investigation.

The Groundwater Monitoring Program (GMP) will have as its primary objective the monitoring of the shallow, weathered bedrock zone as the first significant aquifer or water-bearing unit beneath the Pittsburgh facilities of NETL. Contamination entering the ground from soil surface sources would be expected to impact this zone first and foremost; hence, the majority of wells are placed in this zone. The GMP will also monitor the wells screened in the deeper water-bearing zone in order to provide data on water quality and contaminant migration.

Another goal of the monitoring program is to identify and characterize groundwater flow and relate it to surface water flow conditions to better evaluate potential environmental effects of any groundwater contamination.

By properly determining and characterizing local groundwater conditions, it should be possible to ensure that potential contamination and potential contaminant migration routes are suitably identified and investigated. This should enable sources of potential continuing contamination to be characterized and to be remediated, if warranted).

The 2006 groundwater monitoring was performed according to the NETL-PGH 2006 Groundwater Detection Monitoring Plan (NETL controlled document #: NP001.0804.0271.2001.1.00.0). The NETL-PGH monitoring wells locations are located in Attachment A of this document. To fulfill a Pennsylvania Department of Environmental Protection storage tank closure request, seven wells were monitored for total petroleum hydrocarbons – diesel range organics in 2006. The eighth well, VFW-9, was under the process of modification due to construction in the area. The

results of the NETL-PGH Groundwater Detection Monitoring Program are presented in Table 8.9.5., Table 8.9.6., Table 8.9.7., Table 8.9.8., Table 8.9.9., Table 8.9.10., Table 8.9.11., Table 8.9.12., and Table 8.9.13. The results were compared against federal and state standards for groundwater.

The following is a summary of the results:

- Well VFW-3 exceeded the state drinking water primary MCL and the EPA Region III risk-based tables for tetrachloroethene and the EPA Region III risk- based tables for trichlorethene and chloroform. Well VFW-3 is located adjacent to a laboratory wastewater holding tank with the overflow connected to a French drain. The overflow was connected to the sanitary sewer more than thirteen years ago. Well MPW-11 exceeded the EPA Region III risk-based tables for chloroform. Chloroform is a common laboratory chemical.

- Iron, manganese, chloride, sulfate, and total dissolved solids exceeded standards for four (state drinking water secondary MCL and Act 2 secondary MCL), ten (state drinking water secondary MCL, Act 2 secondary MCL, and EPA Region III risk-based tables), fourteen (state drinking water secondary MCL and Act 2 secondary MCL), three (state drinking water secondary MCL), and seventeen (state drinking water secondary MCL) wells, respectively. This was caused primarily by past mining activities.

- Wells MPW-4 and MPW-8 exceeded EPA Region III risk-based tables for nickel. The contamination is believe to have primarily been caused by the interaction of sodium chloride with the stainless steel well casing.

- Well MPW-10 exceeded state drinking water secondary MCL standards for pH. These wells are installed in limestone bedrock.

Statistical analysis was conducted on the indicators for groundwater contamination (pH, specific conductance, total organic carbon (TOC), and total organic halogens (TOX)) on fifteen groundwater monitoring wells at Pittsburgh. The analysis compared the up gradient wells to the down gradient wells. The up gradient wells are MPW-1, VFW-2 and VFW-10. The results of the statistical analysis for pH showed that, for the tolerance interval-two tailed method, wells MPW-4D, MPW-10, and VFW-2 were outside of the background tolerance intervals. The results of the statistical analysis for specific conductance showed that there was no significant change for the Wilcoxon Rank-Sum Test for Two Groups when used for the Main Plateau Wells, while for the tolerance interval-two tailed method, Well VFW-7 was outside the background tolerance limit. The results of the statistical analysis for TOC showed that, for the tolerance interval-two tailed method, no wells were outside of the background tolerance intervals. The results of the statistical analysis for TOX

showed no significant change for the Wilcoxon Rank-Sum Test for Two Groups for all wells.

Monthly groundwater elevation measurements to determine contaminant transport were completed in accordance with the Groundwater Protection Management Program. The elevations are consistent with the general groundwater flow patterns described previously.

An element of the Groundwater Protection Program is the surface water - groundwater interaction. A piezometer was monitored monthly in 2006 along Lick Run upstream of the site and a piezometer was monitored weekly along Lick Run adjacent to the site to determine if Lick Run is a gaining or losing stream. A gaining stream has groundwater flowing to the stream, while a losing stream has surface water flowing to the groundwater. The data collected indicates that Lick Run upstream of the site is a gaining stream for ten out of the twelve months, while Lick Run adjacent to the site is always a gaining stream.

9.0 ALBANY

9.1 Site Description

The Albany site, formerly known as the Albany Research Center, is a U.S. Department of Energy materials research laboratory located in Albany, OR. Researchers address fundamental mechanisms and processes; melt, cast, and fabricate up to one ton of materials; completely characterize the chemical and physical properties of materials; and deal with the waste- and by-products of materials processes.

Albany was established as the Albany Research Center on June 2, 1942, as part of the U.S. Bureau of Mines. Its mission was twofold: (1) to find methods for using the abundant low-grade resources of the area, and (2) to develop new metallurgical processes using electrical energy. It was known at its establishment as the Northwest Electro-development Laboratory. The 42-acre former campus of Albany College was chosen to house the research facilities.

In 1985, the Center was named an historical landmark by the American Society for Metals.

In 1995, Congress closed the U.S. Bureau of Mines, but the Materials Partnership Program at the Albany Research Center was transferred into the Office of Fossil Energy of the U.S. Department of Energy. On November 27, 2005, the Albany Research Center became part of the National Energy Technology Laboratory.

In recent years, the site has become a key participant in the DOE Vision 21 and FutureGen initiatives, working on issues involving the durability and strength of key materials for high-efficiency power systems. Center researchers are also involved in developing high-strength, lower weight structural components for future automobiles. Researchers are also conducting potential breakthrough experiments in carbon sequestration, concentrating their skills on techniques that capture CO2, a greenhouse gas, and convert it into a solid mineral form.

In 2006, approximately 81 federal employees worked at the site, along with 4 contractor employees and a small contracted security force. Operations at the site do not impact surrounding buildings or neighborhoods. There are seven buildings on the site which are listed for protection in the National Historic Register.

9.2 Major Site Activities

Albany conducts many research and development activities. Two of the principal research activities at the site, refractory material issues in gasifiers and concepts to improve sequestration by mineral carbonation, are discussed below.

Refractory Material Issues in Gasifiers - Gasification is an efficient and environmentally sound way to use coal or other carbonaceous matter in the production of power, steam, or fuel gas, including hydrogen. It also provides a waste CO_2 stream which is easily isolated for sequestration. One of the byproducts from this process is molten slag, which can damage the refractory or lining material in gasifiers. Researchers evaluate different refractory materials and thermocouple designs to reduce the corrosive and damaging effect of molten slag.

Concepts to Improve Sequestration by Mineral Carbonation - This project complements the previously awarded mineral-carbonation project by examining concepts that may lead to improved reaction kinetics and the extent of reaction.

10.0 COMPLIANCE STATUS

10.1 Environmental Restoration and Waste Management

10.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Albany site had no offsite remediation activities that were ongoing during 2006, and there were no National Priorities List (NPL) sites for which they had liability under CERCLA/SARA.

10.1.2 SARA Title III

The Albany site does not use, produce, process, or store hazardous materials in excess of threshold quantities that would trigger EPCRA reporting. Therefore, TRI reporting (Sec. 313) is not necessary. However, emergency response planning has been implemented at the site. A chemical inventory and MSDS database are maintained to aid in the efficient use and storage of chemicals and for worker safety and knowledge. In 2005, the Albany site had a chemical stand-down to reduce the amount of unused and unneeded chemicals and related materials. As a result of that action, 4,484 lbs of hazardous materials were identified for reuse or disposal, and 24,054 lbs of non-hazardous materials were identified.

There were no onsite CERCLA/SARA cleanups at the Albany site in 2006. There were no releases that would trigger reporting to DOE Headquarters Emergency

Operations Center, the U.S. Coast Guard National Response Center, or any other governmental agency.

10.1.3. RCRA Cleanups.

In 2006, there were no spills or leaks from facilities, operations, or other activities that would lead to RCRA cleanups. There were also no cleanups or surveillance activities for leaks or spills that occurred in prior years.

10.2 National Environmental Policy Act

Project managers complete questionnaires regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. In 2006, all funded projects at the Albany site were determined to fall within the realm of categorical exclusions.

10.3 TSCA

Albany did not have any spills or releases of TSCA-regulated substances (e.g., pesticides, PCBs, formaldehyde, methylene chloride, asbestos) in 2006.

10.4 Radiation Protection

10.4.1. Ionizing Radiation Program.

There are only x-ray generating devices used for analytical applications at the Albany site. These include scanning and transmission electron microscopes, x-ray diffraction and fluorescence instruments, and a particle size analyzer. All are examined once a year for leaks and safety controls to insure employee safety. A dosimetry program has also been initiated to check for employee exposures. No sealed sources are located at the site. No radioactive materials are brought to the site, although a few legacy items have been stored in a decommissioned Co-60 hot cell awaiting disposal.

10.4.2. Laser Program.

The Albany office has Class I lasers in common office devices such as laser pointers, CD readers within PCs, and fiber-optic communications lines. These lasers are built into devices that protect the consumer through engineering design. Staff members may also have laser pointers that are either Class II or Class III, commonly used by speakers during lectures and presentations. A laser safety program has not been implemented at the Albany site and is currently viewed as unnecessary due to the absence of more dangerous, higher class lasers on site.

10.5 Air Quality and Protection

Albany has no air quality protection program and no emissions that require monitoring, reporting, or permitting. In 2005 there were no New Source (Pre-Construction) Reviews for any facilities or projects owned or managed by the Albany site. Operation of the Albany site does not contribute significantly to any violations of National Ambient Air Quality Standards (NAAQS). There are no Albany office facilities or projects that are regulated under the National Emission Standards for

Hazardous Air Pollutants (NESHAPS) Program. Albany office facilities and projects do not have the potential to emit more than 10 tons per year of a single designated toxic air pollutant or more than 25 tons per year in aggregate of all toxic air pollutants, nor are any facilities or projects regulated for any of the 189 toxic air pollutants.

Ozone-depleting refrigerants are used for air conditioning, refrigeration, and chilling. There are no plans or activities to completely phase-out of ozone depleting substances at the site, but they are replaced with more environmentally friendly units as the need arises and funding becomes available.

10.6 Water Quality and Protection Activities

Albany held a wastewater discharge permit with the City of Albany through 2006, at which time an application for renewal was submitted. The permit is renewed on a 4-year cycle. Also filed with the city is a slug discharge control plan that must be renewed every 2 years. No storm water permit is held by Albany, since regulation is augmented by the city through the wastewater permit. Albany site activities in 2006 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.

In 2006, there were no tests of the potable water supplies on site to verify compliance with the Safe Drinking Water Act standards, since all potable water is supplied by a local vender in 5-gallon quantities. This water is provided due to the aging water delivery pipes in most buildings at the site. The water supply for Albany comes from the municipal water distribution network and is used for all applications except drinking.

10.7 Executive Orders (EO) and DOE Orders

10.7.1. EO 13149, Greening the Government through Federal Fleet and Transportation Efficiency.

This EO ensures that the federal government exercises leadership in the reduction of petroleum consumption through improvements in fleet fuel efficiency and the use of alternative fuels in alternative fuel vehicles. The Albany office has four vehicles that are owned by GSA. One is a van which is E85-compatible, but no E85 fuel supplies are available locally. A second vehicle, a pickup truck, is capable of using either compressed natural gas (CNG) or gasoline. Albany has an on-site, slow-fill CNG station for fueling the pickup truck. The third vehicle is a gasoline-fueled vehicle. A fourth vehicle is a stake-bed dump truck which is diesel-fueled. It is biodiesel-fuel compatible. These vehicles are included in the NETL statistics that are reported to DOE.

10.7.2. EO 13148, Greening the Government through Leadership in Environmental Management.

This EO requires Albany to ensure that all necessary actions are taken to integrate environmental accountability into day-to-day decision-making and long-term planning processes across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of Albany policies, operations, planning, and management. Albany achieves this requirement through development and implementation of its environmental management system, which is called the Albany Management System (AMS). Through the AMS, Albany ensures that strategies are established to support environmental leadership programs, policies, and procedures, and that senior level managers explicitly and actively endorse these strategies.

Albany was certified to the ISO 14001:1996 standard on 11/30/2005, and has maintained that certification throughout 2006. The Center had been ready to be assessed against the more current 2004 standard at the time of the certification, but was informed that the infrastructure for auditing against the more current standard was not yet fully in place.

10.7.3. EO 13123 -- Greening the Government through Efficient Energy Management.

This EO mandates a comprehensive effort to reduce energy consumption by federal facilities. For example, it aims to reduce greenhouse gas emissions attributed to federal facility energy use by 30% by 2010, compared to emission levels in 1990.

For Albany, electricity costs are included in overall utility costs. In the main administrative building (Building 1) at Albany, lights and air conditioning are governed by a building energy management system that uses timers which are on between 6:00 am and 6:00 pm, and sets back temperatures at night, on weekends, and on holidays. Energy efficient lighting has replaced conventional bulbs in many areas on center, and the staff buys Energy Star products when the opportunity arises. Although there is no formal energy efficiency training in place for the staff, they are involved in receiving informal education and use containers to capture recyclables in their offices.

10.7.4. EO 13101 -- Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.

EO 13101 establishes a general approach and goals for affirmative procurement and recycling activities by federal agencies. The Albany site participates in a recycling program. Receptacles are provided for the collection of waste office paper and aluminum cans throughout the facility. Various scrap materials from building maintenance are also sent to recycling.

The Albany office purchases refilled toner cartridges and office paper made with recycled materials.

Albany utilizes the NETL Small Purchase System (SPS) to buy supplies. This system further encourages affirmative procurement. Individuals who regularly purchase items are instructed to give preference to the purchase of items with recycled content.

10.7.5 DOE Order 435.1, Radioactive Waste Management.

The small amount of radioactive waste on the site is a result of historic operations and is managed under the program described above in Section 10.4 Radiation Protection.

10.8 Groundwater and Soil Quality Protection Activities

In 2001, Albany initiated a groundwater protection and monitoring program in accordance with DOE requirements. The program continues to be a voluntary effort which follows the Oregon Department of Environmental Quality (DEQ) Independent Cleanup Program, with regulatory input. Albany installed 14 monitoring wells (see Figure 10.8 for well locations) on-site in July 2002 and sampled the wells for a broad range of contaminants, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, nitrates, and polychlorinated biphenyls (PCBs) from all 14 wells. Albany also screened for pesticides, herbicides, dioxins, and radiological constituents from a selected subset of the wells. Initial periodic sampling showed concern over elevated levels of VOCs, metals, and radiological constituents. Concern about excessive turbidity of samples that could have directly influenced metals and radiological results resulted in a review of sampling protocols. This review resulted in a resampling using U.S. EPA low-stress protocols for collecting groundwater samples. This resulted in metal and radiological contaminant levels in groundwater found to be at or near background levels for the Willamette Valley in Oregon, where the site is located.

VOC detections during periodic monitoring prompted Albany to further investigate areas of suspected contamination, with planning efforts starting in September 2004 and on-site work initiated in late January 2005. Results from samples taken in February 2005 showed contaminants of potential concern (COPCs) were likely crossing the eastern boundary of the site and migrating toward Liberty Elementary School. After meeting with Oregon DEQ and the Greater Albany Public Schools (GAPS) District personnel, actions were taken to perform site investigations onsite and offsite during March-December 2005. Results of the site investigation showed no concern over surface soils, subsurface soils, soil gas, or ambient air at offsite properties. The only concern identified was with elevated levels of COPCs in groundwater, including trichloroethene (TCE), carbon tetrachloride, and chloroform.

Oregon DEQ initiated sampling of residential wells within an approximate two-block radius of the site due to concerns of residents voiced at town hall meetings and further reviews of the sampling results. A total of 31 residential wells were sampled, with some residential wells (including some used as drinking water) showing elevated levels of COPCs. All of the owners of wells that were used for drinking water were provided bottled water, and NETL is currently pursuing hooking those residences up to City of Albany potable water.

Albany is continuing its site investigation activities and remedial actions in accordance with Oregon DEQ requirements and will pursue actions to protect human health and the environment by eliminating risk and minimizing potential exposures.

10.9 Other Major Environmental Issues and Actions

Compliance with 10 CFR 850. Albany has developed a program based on 10 CFR 850 to comply with the objectives of a chronic beryllium disease prevention program (CBDPP). The program plan was issued in October 2005. This is because beryllium was identified in various locations throughout the site. Remedial action planning is occurring while protective health measures have been instituted. Albany was also involved with testing for suspected contamination as described in Section 4.7.

11.0 TULSA

11.1 Site Description

The Tulsa office, having no laboratory facilities, does not engage in the same compliance assessment processes as the Morgantown, Pittsburgh, or Albany sites. Because building and facility operations and maintenance are under the control of the landlord, the Tulsa office itself has to comply with few ES&H regulations. Therefore, the Tulsa office does not undertake in-house audits, external audits, or subject matter reviews, and regulatory agencies do not conduct ES&H inspections or investigations of activities. However, in-house inspections and regulatory agency inspections (e.g., by the local fire marshal or municipal building inspectors) of the building and facilities could occur, with any subsequent findings assessed against the landlord.

Building occupants participate in fire drills, which are conducted according to local fire marshal requirements and in cooperation with the building management.

Volunteer fire wardens conduct roll calls during drills and facilitate orderly evacuations. Tornado drills are announced through a building-wide public address system and are conducted in accordance with Occupational Safety and Health Administration emergency response requirements.

The City of Tulsa does not impose recycling requirements that would apply directly to office space lessees. Nevertheless, building management has arranged for various recycling activities throughout the office building complex.

There were no citations for violations of ES&H laws, regulations, or ordinances in 2006.

11.2 Major Site Activities

All facilities of the NETL office in Tulsa are located in The Williams Center, a downtown office building complex. The offices are leased by NETL from the Southwestern Power Administration (SWPA). In 2006, the Tulsa office undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the offices.

12.0 COMPLIANCE STATUS

12.1 Environmental Restoration and Waste Management

The Tulsa office had no offsite remediation activities, no onsite CERCLA/SARA cleanups, and no spills or leaks from facilities or operations that were ongoing during 2006. There were no National Priorities List (NPL) sites for which NETL had liability under CERCLA/SARA. There were no cleanups or surveillance activities for leaks or spills that occurred in prior years or other activities that would lead to RCRA cleanups.

Tulsa does not have a program to deal with hazardous waste; however, building management does recycle some RCRA universal (semi-hazardous) waste materials. They also provide pickup and handling services for the disposal or recycling of dry-cell batteries, fluorescent light bulbs, and light ballasts.

12.2 National Environmental Policy Act

Tulsa conducts NEPA reviews for proposed offsite federal actions. These actions relate to contract awards or grants to other governmental organizations, educational institutions, and private industry. Project managers complete questionnaires regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. The completed forms are evaluated by one of two NEPA compliance officers at the Tulsa office for a determination of the appropriate level of NEPA review (i.e., EIS, EA, or categorical exclusion). In 2006, all funded projects were determined to be categorical exclusions. There were 11

NEPA reviews that resulted in categorical exclusions. The Tulsa office NEPA compliance officers follow Council on Environmental Quality (CEQ) regulations, DOE regulations, and DOE orders and guidance documents.

12.3 TSCA and FIFRA

Tulsa housed no TSCA-regulated substances, and no restricted-use pesticides, herbicides, or defoliants were kept within the offices in 2006 or any other years. The landlord and building management organization provide pest control services and grounds keeping services.

12.4 Radiation Protection

12.4.1 Ionizing Radiation Program.

There are no ionizing radiation sources at Tulsa.

12.4.2 Laser Program

Tulsa has Class I lasers in common office devices such as laser printers, CD readers within PCs, and fiber-optic communications lines. These lasers are built into devices which protect the consumer through engineering design. Staff members may also have laser pointers that are either Class II or Class III and are commonly used by speakers during lectures and presentations. A laser safety program has not been implemented at the Tulsa site and is currently viewed as unnecessary due to the absence of more dangerous, higher class lasers on site.

12.5 Air Quality and Protection

Because it is strictly an administrative office, Tulsa has no air quality protection program and no emissions that require monitoring, reporting, or permits. In 2006 there were no New Source (Pre-Construction) Reviews for any facilities or projects owned or managed by the Tulsa office. Operation of the Tulsa office does not contribute significantly to any violations of National Ambient Air Quality Standards (NAAQS). There are no Tulsa office facilities or projects that are regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAPS) program. Tulsa office facilities and projects do not have the potential to emit more than 10 tons per year of a single designated toxic air pollutant or more than 25 tons per year in aggregate of all toxic air pollutants, nor are any facilities or projects regulated for any of the 189 toxic air pollutants.

Any ozone-depleting refrigerants used for air conditioning inside the offices are under the control of the building management organization. There are no plans or activities relating to the phase-out of ozone depleting substances at Tulsa. Such activities would be undertaken by the building management organization.

12.6 Water Quality and Protection Activities

The building landlord and the landlord’s building management contractor deal with sewer use permits and storm water runoff control and permits. It is assumed that the

level of impact on surface water has been about the same as for other office complexes in the region. Tulsa office activities in 2006 resulted in no unplanned releases, leaks, or spills that would require reporting to governmental agencies.

In 2006, there were no tests of the potable water supplies on site to verify compliance with the Safe Drinking Water Act standards. Tulsa's water supply comes from the municipal water distribution network.

12.7 Executive Orders

12.7.1 EO 13148 -- Greening the Government through Leadership in Environmental Management.

This EO requires federal agencies to implement an EMS. However, as previously discussed, the Tulsa office engages in minimal ES&H activities. The office consists of one floor of leased space inside an office building complex. Onsite ES&H primarily focuses on Order 231.1 reporting (e.g., worker injury and lost work day data), the NEPA process, and affirmative procurement of office supplies and miscellaneous items. Tulsa does not maintain an EMS and is not covered by NETL's system that is in effect at the Pittsburgh and Morgantown sites. Inclusion of the Tulsa office may be considered in the future. Tulsa does not have a formal pollution prevention program; however, staff members are involved through activities described under the Pollution Prevention Program above.

12.7.2 EO 13123 -- Greening the Government through Efficient Energy Management.

Tulsa's electricity costs are included in the rent. Lights and air conditioning are governed by a building energy management system that uses timers, which are on between 6:00 am and 6:00 pm and off at night, on weekends, and on holidays. Windows in the building are tinted and sealed, further reducing the need for cooling. Energy efficient lighting has replaced conventional bulbs, and the staff buys Energy Star products when the opportunity arises. Although there is no formal energy efficiency training in place for the Tulsa staff, they receive informal education through the use of posters throughout the office, and there are containers for recyclables in their offices.

12.7.3. EO 13101, Greening the Government trough Waste Prevention, Recycling, and Federal Acquisition.

Tulsa participates in a recycling program established by the landlord and the building management contractor (Metropolitan, Inc.). Receptacles are provided for the collection of waste office paper and aluminum cans. Building management sends the items that can be marketed to local recyclers. All recycling efforts are led by the building management organization. Various scrap materials from building maintenance are also sent to recycling. Tulsa purchases

office paper made with recycled materials and uses refilled toner cartridges. There are no statistics on the amount of materials recycled on behalf of Tulsa. Tulsa uses the NETL Small Purchase System (SPS) to buy supplies. This system further encourages affirmative procurement. Individuals who regularly purchase items are instructed to give preference to the purchase of items with recycled content. Large volume items are purchased through the Morgantown warehouse.

12.8 Groundwater and Soil Quality Protection Activities

There are no groundwater or soil quality protection activities at Tulsa.

12.9 Other Major Environmental Issues and Actions

Tulsa is not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, or any non-routine releases of pollutants. There were no violations of any compliance agreements or cleanup agreements or any unresolved compliance issues. There were no audits conducted in 2006 under the sponsorship of DOE Headquarters.

13.0 FAIRBANKS

13.1 Site Description

The photograph used on the front cover of this report was taken by the Fairbanks office. It shows a pumping operation performed at Hinzeman Lake in Alaska that is managed through the Fairbanks office. The actual location of the Fairbanks site is in rented office space in the Duckering Building on the campus of the University of Alaska at Fairbanks. In 2006 Fairbanks undertook no actions to alter facilities or operations in a manner that could change the current impacts on the environment around the office. Any significant new environmental impacts would be associated with offsite projects supported or funded through the Fairbanks office.

14.0 COMPLIANCE STATUS

14.1 Environmental Compliance

Because of the nature of the work (contracts administration), the small number of employees (four), and the waste management services provided by the University under the terms of the rental agreement, Fairbanks is not required to implement an environmental compliance program. It has never formally implemented a pollution prevention program. The staff members do engage in affirmative procurement (i.e., the procurement of goods containing recycled content or having less life-cycle impact on the environment). The staff also contributes to the local recycling efforts and undertakes energy-saving steps, such as turning off lights and PCs when not needed. Recycling efforts are managed by the university in coordination with the local borough and include office paper, cardboard, and glass bottles. Fairbanks ships its spent toner cartridges to the Morgantown site for recycling.

14.2 National Environmental Policy Act

Fairbanks requires NEPA reviews for proposed offsite actions. These actions relate to contract awards to other governmental organizations, educational institutions, and private industry. Project proponents fill out a questionnaire regarding the potential for environmental impacts associated with project proposals that are under consideration for funding or financial support. The completed questionnaire is reviewed by the NEPA compliance officer at the Pittsburgh office for a determination of the appropriate level of NEPA review (i.e., EIS, EA, or categorical exclusion). In 2006, all Fairbanks-funded projects were determined to fall within the realm of categorical exclusions.

14.3 EO 13148 -- Greening the Government through Leadership in Environmental Management.

Fairbanks engages in minimal ES&H activities. The office consists of approximately 1,000 square feet of leased space inside a university building. Onsite ES&H primarily focuses on the NEPA process and affirmative procurement of office supplies and miscellaneous items. The office does not maintain an EMS and is not covered by NETL's EMS system that is in effect at the Pittsburgh and Morgantown sites. Inclusion of Fairbanks into the NETL EMS may be considered at some time in the future.

14.4 Other Major Environmental Issues and Actions

Fairbanks staff members are not aware of any ongoing or pending lawsuits, notices of violation of regulations, public accusations of regulatory violations, environmental occurrences, or any non-routine releases of pollutants. There were no violations of compliance agreements or cleanup agreements, nor were there any unresolved compliance issues. There were no audits conducted in 2006 under the sponsorship of DOE Headquarters, independent regulators, or other independent third parties.

APPENDIX

ACHD	Allegheny County Health Department
AEO	Arctic Energy Office (Fairbanks)
AFV	Alternative Fuel Vehicle(s)
AIIS	Assessment Information Input System
ARC	Albany Research Center (Albany)
ASER	Annual Site Environmental Report
B-	Building
CBT	Computer-Based Training
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	U.S. Code of Federal Regulations
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ES&H	Environment, Safety, and Health
FE	Office of Fossil Energy
FEMP	Federal Emergency Management Program
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GPDU	Gas Process Development Unit
GSA	U.S. General Services Administration
HVAC	Heating, Ventilation, and Air Conditioning
ISM	Integrated Safety Management
ISO	International Standards Organization
LEED	Leadership in Energy and Environmental Design
MGN	Morgantown, West Virginia
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NETL	National Energy Technology Laboratory
NOV	Notice of Violation
NPL	National Priorities List
ODS	Ozone-depleting Substance
P2	Pollution Prevention Program
PADEP	Pennsylvania Department of Environmental Protection
PC	Personal Computer
PCBs	polychlorinated biphenyls

PGH	Pittsburgh, Pennsylvania
PHA	Pleasant Hills Authority
PPOA	Pollution Prevention Opportunity Assessment
PQAE	Project Quality Assurance Engineer
QA/QC	Quality Assurance/Quality Control
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SARS	Safety Analysis and Review System
SPS	Small Purchase System
sq.ft.	Square Feet
SWPA	Southwestern Power Administration
TMDL	Total Maximum Daily Loading
TPH	Total Petroleum Hydrocarbons
TRI	Toxic Release Inventory
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
VOC	Volatile Organic Compound
WVDEP	West Virginia Department of Environmental Protection
WWTF	Wastewater Treatment Facility

Table 3.3 Significant Environmental Aspects – Pittsburgh and Morgantown

Aspect 1: Waste generation, management, and disposal practices
Aspect 2: Energy and fuel use
Aspect 3: Hazardous materials procurement, consumption, storage, and release
Aspect 4: Control over industrial wastewater treatment facility operations and discharges
Aspect 5: Air emissions
Aspect 6: Potential exposure to toxic chemicals and energy releases
Aspect 7: Understanding of surface waste and storm water discharges
Aspect 8: Raw materials usage (increasing "green" purchasing)
Aspect 9: Off-site noise generated on-site
Aspect 10: Non-industrial land use

Table 3.4 EMP Objectives and Targets – Pittsburgh and Morgantown

EMP	Objective	2006 Target
Aspect 1 – Waste Generation, Management, and Disposal Practices		
1.1 Non-hazardous Waste Generation	Reduce non-hazardous waste.	Generate less than 186 metric tons for a reduction of 75% from the 1993 level of 641 metric tons.
1.2 Hazardous Waste Generation	Reduce hazardous waste.	Reduce RCRA hazardous waste to 2.86 tons for a reduction of 90% from 1993 baseline of 18.46 tons.
1.3 Recycling	Increase the amount of recycled material.	Increase recycling of sanitary waste streams to 46% based on the 2002 baseline (31%)
Aspect 2 – Energy and Fuel Use		
2.1 Energy Use	Reduce energy use in buildings at NETL.	Reduce energy use per square foot in laboratory and industrial (mixed-use) facilities to 270 X 10^3 Btu/ft2 for a reduction of 20% from the 1990 baseline of 369 X 103 Btu/ft2.
2.2 Annual Petroleum Fuel Consumption	Reduce annual petroleum consumption at NETL.	Reduce annual petroleum consumption (adjusted for mileage) for the NETL vehicular fleet to .0290 gallons per mile for a reduction of 20% of the 2001 baseline of 0.0367 gallons/mile.
2.3 Usage Rate of Alternative Fuels	Increase usage rate of alternative fuels at NETL.	Increase usage rate of alternative fuels to 38% using the 2001 baseline of 13.7%.
Aspect 3 – Hazardous Materials Procurement, Consumption, Storage, and Release		
3.1 Chemical Inventory	Reduce the chemical inventory.	Reduce the chemical inventory to 5,148 containers for a reduction of 20% from the 2002 baseline of 6,600 containers.
Aspect 4 – Control over Industrial Wastewater Treatment Facility Operations and Discharges		
4.1 Notices of Violation (NOVs)	Improve operation of the wastewater treatment facility.	Zero NOVs.
Aspect 5 – Air Emissions		
5.1 Class I Refrigerants	Eliminate Class I ODS refrigerants.	Reduce CFC inventory to 94 pounds from the 2002 baseline of 190 pounds.
5.2 Greenhouse Gases	Reduce emission of greenhouse gases.	Reduce emissions to 49.2 million pounds for a reduction of 25% from the 1990 baseline of 67.4 million pounds.

Table 3.4 EMP Objectives and Targets – Pittsburgh and Morgantown		
EMP	**Objective**	**2006 Target**
5.4 Emissions of TRI Chemicals	Decrease air emissions of toxic compounds.	To establish the baseline to reduce emissions of chemicals on the TRI List by 20% by 2010 of operations and projects that are significant contributors to air emissions using 2006 as a baseline normalized by operating hours.
Aspect 6 – Potential Exposure to Toxic Chemicals and Energy Releases		
6.1 Chemical Handling Facility (CHF)	Decrease risk levels to the environment and to workers associated with chemical and/or energy releases.	Complete construction of the CHF.
Aspect 7 – Understanding of Surface Waste and Storm Water Discharges		
7.1 Water Discharge	No objective for this aspect.	No target for this aspect.
Aspect 8 – Raw Materials Usage (increasing "green" purchasing)		
8.1 Buying Green	Determine the baseline for potential green purchases made with credit cards	Increase the number of green purchases made with credit cards to 5%.
Aspect 9 – Offsite Noise Generated Onsite		
9.1 Offsite Noise	No objective for this aspect.	No target for this aspect.
Aspect 10 – Non-Industrial Land Use		
10.0 Land Use	Conserve and enhance the NETL non-industrial land.	Establish a baseline for non-industrial land use.

Table 4.4.a Morgantown 2006 Radioactive Materials Inventory			
Isotope	**Activity/Date Determined**	**Source**	**Location**
Kr-85	2 mCi 3/30/81	Model #3077, Serial #700T, Thermo-Systems Inc.	B-16, Radioactive Material Storage Cabinet
Kr-85	2 mCi 1/02/79	Model #3012, Serial #467T, Thermo-Systems Inc.	B-16, Radioactive Material Storage Cabinet
Kr-85	2 mCi 5/19/80	Model #3012, Serial #626T, Thermo-Systems Inc.	B-16, Radioactive Material Storage Cabinet
Kr-85	2 mCi 5/78	Model #3077, Serial #373T, Thermo-Systems Inc.	B-25, Room 212
Kr-85	2 mCi 3/30/81	Model #3077, Serial #697T, Thermo-Systems Inc.	B-25, Room 212
Ni-63	15 mCi 6/01/84	Model #6000204, Serial #533, Perkin-Elmer Corp.	B-19, Storeroom
Sc-46	0.065 mCi 7/01/90	University of Missouri	B-16, Radioactive Material Storage Cabinet
Sc-46	0.046 mCi 2/12/91	University of Missouri	B-16, Radioactive Material Cabinet
Ra-226	9 uCi 1/56	Model #B-5, Serial #11205, Mettler Corp.	B-25, Room 206
Ra-226	21 uCi 1/56	Model #M-5, Serial #17032, Mettler Corp.	B-25, Room 112
Ra-226	9 uCi 1/56	Model #B-5 GD, Serial #13805, Mettler Corp.	B-3, Area 150
Phosphate Rock	Consumer Product	Model #1080, Sun Nuclear Corp.	B-16, Radioactive Material Cabinet

Table 4.4.a Morgantown 2006 Radioactive Materials Inventory			
Isotope	**Activity/Date Determined**	**Source**	**Location**
H-3	20 Ci 5/94	Model #B100/U10, Serial #575263, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574434, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574435, SRB Technologies	B-33
H-3	20 Ci 5/94	Model #B100/U10, Serial #574436, SRB Technologies	B-33
Co-57	12 mCi 12/95	Model #IPL CUS, Serial #EE661, Isotope Products Lab	B-16, Industrial Hygiene Laboratory
Cs-137	1 uCi 2/99	Tele-Atomic, Inc	B-25, Room 202
Cs-137	10 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Ba-133	1 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Ba-133	10 uCi 2/99	Tele-Atomic, Inc	B-25, Room 202
Tl-204	1 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Tl-204	10 uCi 2/99	Tele-Atomic, Inc.	B-25, Room 202
Cd-109	10 mCi 5/01	Model #XFB3205, Serial #NR2032, IPL Inc.	B-33

Table 4.4.b Pittsburgh 2006 Radioactive Sealed Sources in Use				
Isotope	**Qty**	**Activity**	**Supplier/Source**	**NRC License**
Ni-63	1	15 mCi	Gas Chromatograph Electron Capture Device	Held by Hewlett Packard
Cs-137	3	40 mCi (2); 20 mCi (1)	Ronan Engineering Company, Model 137; Level Density Gauge	Held by Parsons
Assorted	80	Consumer Product	Smoke Detectors	Not Required

Table 4.4.c Pittsburgh 2006 X-Ray Radiation Generating Devices		
Device	**Quantity**	**Location**
X-Ray Tube	1	B-922 Mail Sorting Facility
X-Ray Diffraction Instrument	1	B-94 X-Ray Diffraction Laboratory
Scanning Election Microscope	2 Devices	B-94 and B-84 SEM Laboratories
Electron Spectroscopy for Chemical Analysis	2 X-Ray Tubes	B-94 Electron Spectroscopy for Chemical Analysis Laboratory

Table 4.11.a Summary of Permits – Morgantown Site

Permit Number and Name	Issue Date Exp. Date	Regulatory Agency	Description
R13-1768 Permit to Construct, Modify, or Relocate Stationary Sources of Air Pollutants	05/01/1995 to N/A	WVDEP, Office of Air Quality Permitting Section	This permit allows for the construction and modification of the experimental syngas generator/Hot Gas Desulfurization Process Development Unit (GPDU). It sets forth hours/type of operation and required recordkeeping including reporting requirements.
061 00064 Certificate to Operate	07/01/2005 to 06/30/2006	WVDEP, Division of Air Quality	This permit allows for the operation of the syngas generator/GPDU. The certificate is valid for 1 year.
MUB 012 Industrial Wastewater Discharge Permit	07/01/2005 to 06/30/2010	MUB	This permit allows for the operation of wastewater pretreatment facilities and discharge into the MUB's sanitary sewer system. It sets discharge limits and monitoring requirements, compliance with the Morgantown Industrial Waste Ordinance, reporting requirements including accidental discharge reporting, and testing procedures.
WV0111457 General WV/National Pollutant Discharge Elimination System (NPDES) Storm Water Permit	04/01/2004 to 03/31/2009	WVDEP, Office of Water Resources	This general permit covers storm water associated with industrial activity. It identifies activities that are covered by the permit and the associated monitoring and analysis requirements for each. Also discussed are the Storm Water Pollution Prevention Plan and Groundwater Protection Management Plan required by the permit.
WVG610042 Registration Permit for General WV/NPDES Storm Water Permit	12/07/2004 to 03/31/2009	WVDEP, Office of Water Resources	The general permit registration allows NETL to operate under permit WV0111457, above. The registration establishes the schedule for submission of discharge monitoring reports, as well as discussions on monitoring, sampling, and analysis requirements. This registration makes the general WV permit applicable to NETL.

Table 4.11.b Summary of Permits – Pittsburgh Site

Permit No. Expiration Date	Permit Type	Regulatory Agency	Description
7032056-000-00500 A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit	Air	ACHD	4,500,000-Btu/hr Cleaver Brooks natural gas boiler located in B-922.
7032056-000-00501 A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit.	Air	ACHD	Three 1,630,000-Btu/hr RayPak finned coppertube boilers located in B-922
7023056- A Title V permit was administratively accepted but not formally issued. No expiration date has been established for this permit.000-00800	Air	ACHD	500-lb/hr gas-and coal-fired research combustion unit in B-86.

Table 4.11.b Summary of Permits – Pittsburgh Site

Permit No. Expiration Date	Permit Type	Regulatory Agency	Description
GF 31062.008 12/28/2002. Waiting for PHA to issue a new permit.	Industrial Sewer Use	PHA	Establishes the permissible waste water effluent discharge of certain process/laboratory/ waste-water constituents.
PA0025844 07/11/2001. A renewal application was submitted on 01/11/2001 but a new permit has not yet been issued.	Storm water Discharge	PADEP	National Pollutant Discharge Elimination System (NPDES) permit for the discharge of site storm water into the public waterways of Pennsylvania.
PA0297201 Not applicable	Industrial Settling Weir	PADEP	Permit for an industrial settling weir owned by the U.S. National Institute of Occupational Safety and Health
02-81183008A 10/04/2007.	Aboveground Storage Tank Registration	PADEP	Permit for tank containing ferric chloride.
02-81183009A 10/04/2007.	Aboveground Storage Tank Registration	PADEP	Permit for tank containing caustic soda.
S-343	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of a gasoline aboveground storage tank.
S-343	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of a diesel fuel aboveground storage tank.
S-343	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of a No. 2 fuel oil aboveground storage tank.
S-1018	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of an ethanol aboveground storage tank.
S-1102	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of a gasoline aboveground storage tank.
S-1102	Certificate of Fire and Explosion Safety	Allegheny County Fire Marshal	Approval for the storage and handling of the contents of a diesel fuel aboveground storage tank.
PAA-060151	Asbestos	ACHD	Asbestos Abatement Permit for B-95.
PAA-060152	Asbestos	ACHD	Asbestos Abatement Permit for B-74.

Table 4.11.a CY 2006 Environmental Management Plan Metrics

Environmental Management Plan	Objective/Target	Baseline	2006 Target	(1) Number of Milestones	(2) Number of Milestones Completed	(3) Is Objective/Target Expected to be Met? (Yes/No)	(4) Other Information and Concerns with EMPS and Plans to Address Those Concerns (If target Is not expected to be met, please explain)
Aspect 1 – Waste Generation, Management, and Disposal Practices							
1.1 Non-Hazardous Waste Generation	80% reduction by 2010 based on 1993 baseline (641 tonnes)	641 % Reduction	**154 (76%)**	4	1	No	Target was modified to 183 tonnes/year by the Management Review Team on August 9, 2006. Objective in 2007 will be changed to 75% reduction by 2010 instead of 80%. ** Out of 4 milestones, 1 is complete, 2 are ongoing, and 1 is on hold pending completion of WWTF process/facility upgrades.
1.2 Hazardous Waste Generation	90% reduction of routine hazardous wastes by 2010, using the 1993 baseline (18.46 tonnes)	18.46 % Reduction	**2.86 (85%)**	4	4	Yes	3612 lbs or 1.64 tonnes disposed of in CY2005. Recycled 3-55 gallon drums of methanol in CY2005
1.3 Recycling	Increase recycling of sanitary waste streams to 50% by 2010 based on the 2002 baseline (31%)	31% % Increase	**46%**	2	2	No	**Both milestones represent ongoing efforts with no anticipated completion timeframe. It is also felt that the target is too optimistic and must be revised. If only routine non-hazardous waste is taken into consideration, NETL recycled approximately 60%. If legacy wastes are included, the recycled weight percentage drops to 42%.
Aspect 2 – Energy and Fuel Use							
2.1 Energy Use	Reduce energy use/square foot by 2%/CY from 2006 through 2015, achieving a 20% reduction in energy use/sq.ft. using CY	274.E+03 % Reduction	**269E+03 (2.0%)**	7	4	Yes	EMS-4 Data Base Baseline Calendar Year 2003 Btu/gsf = 275,243 EMS-4 Data Base Current Calendar Year 2006 Btu/gsf = 199,940 This represent a reduction in energy use/gsf of 75,303, or 27.35% reduction in energy use/gsf over calendar year 2003 data.

	2003 as the baseline.						
2.2 Annual Petroleum Fuel Consumption	Reduce annual petroleum consumption (adjusted for mileage) for NETL's vehicular fleet by 25% by 2010 using 2001 baseline (adjusted for mileage) of 0.0367 gallons per mile.	0.0367 % Reduction	**0.0290 (21.0%)**	1	1	No	In FY06 we were able to reduce oil-based fuel useage by amost 3,000 gallons and increased our usage of alternative fuels by almost 9,200 gallons. The total use of alternative fuels was almost 52% of the fuel used. This was accomplished even though we traveled more miles and used over 6300 gallons of fuel in FY06.
2.3 Usage Rate of Alternative Fuels	Increase usage rate of alternative fuels to 50% by 2010 in areas where alternative fuel infrastructure is available. Baseline in 2001 is 13.7%	13.7%	**38.0%**	1	1	Yes	In FY06 we were able to reduce oil-based fuel useage by amost 3,000 gallons and increased our usage of alternative fuels by almost 9200 gallons. The total use of alternative fuels was almost 52% of the fuel used. This was accomplish even though we traveled more miles and used over 6300 gallons of fuel in FY06.
Aspect 3 – Hazardous Materials Procurement, Consumption, and Storage							
3.1 Chemical Inventory	Reduce the chemical inventory (number of containers) by 30% by 2010 based on the 2002 baseline (6600 containers)	6600 % Reduction	**5148 (22.0%)**	0	0	No	The combined inventory for the Pittsburgh and Morgantown sites was 11,319. After an initial reduction of the NETL (Pittsburgh and Morgantown) chemical inventory, the inventory has been steadily increasing over the last few years. There are several factors that may be responsible for this trend.
Aspect 4 – Industrial Wastewater Treatment Plant Operations							
4.1 Notices of Violation (NOVs)	To reduce the number of NOV's issued to the WWTF to zero through 2010.		**0**	3	1	Yes	The target has been met (Zero NOV's).
Aspect 5 – Air Emissions							
5.1 Class 1 Refrigerants	Eliminate use of Class I refrigerants by year 2010, to the extent economically practicable, and to the extent that safer	190	**94**	1	1	Yes	2006 Class I refrigerant inventory = 76.33 lbs, which translates to a reduction in Class I refrigerant of 59.82 % versus baseline year 2002 Class I refrigerant inventory of 190 lbs.

	alternatives are available (baseline inventory = 190 lbs in 2002)						
5.2 Greenhouse Gases	Reduce greenhouse gas emissions attributed to facility use through life-cycle cost effective measures by 30% by 2010, using 1990 as a baseline (67.4 million lbs)	67400000 % Reduction	**49876000** **0**	2	2	Yes	EMS-4 Baseline 1990 CO2 Emissions = 67,443,000 lbs. EMS-4 Calendar year 2006 CO2 Emissions = 51,472,000 lbs. This represents a reduction in CO2 Emissions for 2006 of 15,971,000 lbs or 23.8% versus baseline year of 1990.
5.3 Emissions of Toxic Release Inventory (TRI) Chemicals	To reduce emissions of chemicals on the TRI List by 20% by 2010 of operations and projects that are significant contributors to air emissions using 2006 as a baseline normalized by operating hours.	2006 Baseline	**Establish Baseline**	5	5	Yes	A decision has been made to discontinue this EMP. The committee is now considering adding a new EMP to address air toxic goals of DOE O450.1, chg 2. A decision will be made in early CY07.
Aspect 6 – Toxic Chemicals and Energy Releases							
6.1 Chemical Handling Facility	To improve the way the CHF stores and handles chemicals		**Complete all construction**	1	1	Yes	Constructionm of Building 92 new hazardous waste treatment was completed on 10/30/2006. Relocation of hazardous waste packaging and other chemical handling and storage activities from other areas into Building 92 is underway.
Aspect 8 – Green Purchasing							
8.1 Buying Green	Determine the baseline for potential "green" purchases made with credit cards. Increase the number of "green" credit card purchases by 25% by 2010 of items in EPA-		**0**	1	0	No	Working with IT support to expand upon data extracted from SPS to ensure we capture all of the EPA-designated items. Process is time consuming since SPS can only query by federal stock code groups and not federal stock numbers. Hopefully, this will be corrected with new HQ purchasing systems scheduled for 2008.

	designated categories using the 2006 baseline.						
Aspect 10 – Non-Industrial Land Use							
10.1 Land Use	To conserve and enhance NETL's nonindustrial lands by maintaining or increasing the percentage of green space using the 2006 baseline.	2006 Baseline	**Establish Baseline**	0	0	No	Not met. No funding available to meet the implementation target.

Table 4.14.b -- Summary of EMP Activity

All EMPS	Task Totals		63	51
	Percent Tasks Complete			81%
	Annual Estimate (Percent * 4/Q)			81%
	EMPS/Tartgets	Green	15	68%
		Yellow	4	18%
		Red	3	14%
	Total Targets		22	77% Percentage = (Green + .5 Yellow)/Total
ES&H EMPS	Task Totals		32	26
	PercentTasks Complete			81%
	Annual Estimate (Percent * 4/Q)			81%
	EMPS/Targets	Green	6	67%
		Yellow	1	11%
		Red	2	22%
	Total Targets		9	72% Percentage = (Green + .5 Yellow)/Total
SOD EMPS	Task Totals		21	17
	PercentTasks Complete			81%
	Annual Estimate (Percent * 4/Q)			81%
	EMPS/Targets	Green	7	78%
		Yellow	2	22%
		Red	0	0%
	Total Targets		9	89% Percentage = (Green + .5 Yellow)/Total

Table 4.14.c Surveillance Monitoring					
Type of Surveillance	**Contact**	**Type of Monitoring**	**Key Characteristics**	**Frequency**	**Location**
SARS review	ES&H Division	Review of requirements in SARS procedure	Operational control, document control	Annually	Various laboratories, support operations, and facilities
ES&H management walkthrough	ES&H Division	Visual inspection of work sites	ISM observance	Monthly	Various laboratories, support operations, facilities on a rotating basis to ensure entire site coverage over one year.
Transformer inspection (MGN)	EG&G	Visual assessment of oil-filled transformer	Regulatory compliance	Daily	Site-wide
Transformer inspection (PGH)	SAIC	Visual assessment of oil-filled transformer	Regulatory compliance	Weekly	Site-wide
Storage tank inspection (MGN)	EG&G	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Interstitial storage tank monitoring (MGN)	EG&G	Interstitial monitoring of dual-wall tanks	SPCC plan compliance, regulatory compliance	Quarterly	B29, B36, Navy facility fuel storage tanks
Storage tank inspection (PGH)	SAIC	Visual assessment of oil-filled storage tanks	Regulatory compliance	Weekly	Site-wide
Radiation gauge survey	Parsons	Leak test of radiation sources	Regulatory compliance	Semi-annual	At radiation sources, B-84
Safety observer inspection (PGH)	EG&G	Visual inspections of work-sites	Contractor ISM observance, operational control	Semi-annual	Site-wide
Water usage (PGH)	Site Operations Division	Document water usage	Operational	Daily	B-83, 84, 93, 94, chillers, boiler house
Backup generators (PGH)	SAIC	Backup generators inspection	Operational	Weekly	Site-wide
Chemical handling facility (CHF) (PGH)	EG&G	CHF operations inspection checklist	Operational	Daily	B64, B91, B92

Table 6.1.1 NETL Potential Contamination Sources and Cleanup Actions		
Potential Source	**Potential Contamination**	**Current Status**
Underground Storage Tanks	BTEX	All tanks removed 1991 or before.
42-Inch Coal Gasifier	Coal Tar, Polynuclear Hydrocarbons, BTEX	Gasifier removed; soil removed to a depth of 10 feet in 1994.
Stretford Pad	Stretford Solution (vanadium and cadmium compounds)	Pad removed; soil removed to a depth of 10 feet in 1994.
Wastewater Pond 001	Coal Tar, Polynuclear Hydrocarbons, BTEX, metals	Removed in 1995; site filled and re-graded.
Wastewater Pond 002	Coal Tar, Polynuclear Hydrocarbons, BTEX, metals	Removed in mid-1980s.
Wastewater Pond 005	Coal Tar, Polynuclear Hydrocarbons, BTEX, cyanide, metals	Removed in 1985; backfilled and paved as a parking lot.
Contaminated Sewer Lines	Mercury	Removed the contaminated portion of the lines which was from B-1 to a point east of B-3. The line from B-3 to Burroughs Run was left in place and is still being used as the major storm water drainage line for the site. This is a 15" vitrified tile line that discharges to Burroughs Run at the 002 outfall.
Underground process lines used to convey contaminated process water from the old 42" fixed-bed gasifier and/or B-4 to an activated carbon treatment system and Pond 005.	Coal Tar, Polynuclear Hydrocarbons	Capped and abandoned in place. They were/are not part of any NETL sewer system (i.e., storm, sanitary, or contaminated).

Table 6.1.2 Properties of Potential Contaminants						
Contaminant Suite	**Potential Contaminant**	**Density (g/ml)**	**Physical State**	**Water Solubility**	**Sorption Coefficient**	**Carcinogenic**
			@ approx. 20 deg C		log KOC	
Coal Tar	Acenaphthalene	0.899	Solid	3.93 mg/l	3.68	
Polynuclear Hydrocarbons	Acenapthene	1.069	Solid	3.47-3.93 mg/l	3.79	
	Benzo(b)fluoranthene		Solid	0.0012 mg/l	5.74	potential
	Benzo(k)fluoranthene		Solid	0.00055 mg/l	6.64	potential
	Benzo(a)anthracene	1.274	Solid	0.01-0.44 mg/l	6.14	+
	Benzo(a)pyrene	1.351	Solid	0.003 mg/l	5.60-6.29	+
	Benzo(e)pyrene	0.8769	Solid	0.004 mg/l	5.6	+
	Biphenyl (diphenyl)	0.866	Solid	7.5 mg/l	3.23	
	Chrysene	1.28	Solid	0.0015-0.006mg/l	5.39	weak
	Coronene		Solid	0.00014 mg/l	7.8	
	o-Cresol (2-methylphenol)	1.041	Solid	24,500 mg/l	1.34	
	Dibenzofuran	1.0886	Solid	10 mg/l	3.91-4.10	

Table 6.1.2 Properties of Potential Contaminants

Contaminant Suite	Potential Contaminant	Density (g/ml)	Physical State	Water Solubility	Sorption Coefficient	Carcinogenic
	Dibenz(a,h)anthracene	1.282	Solid	0.005 mg/l	6.22	+
	Fluoranthene	1.252	Solid	0.275 mg/l	4.62	potential
	Fluorene	1.203	Solid	1.9 mg/l	3.7	potential
	Indene	1.006	Liquid			
	3-Methylcholanthrene					+
	Methyldibenzofuran					
	Methylphenanthrene (1,2,3,4-)	1.161	Solid	0.073 mg/l	4.56	
	1-Methylnaphthalene	1.025	Liquid	26-28 mg/l		
	2-Methylnaphthalene	1.006	Solid	24.6-25.4 mg/l	3.87-3.93	
	4-Methylphenol (p-cresol)	1.0347	Solid	19,400 mg/l	1.69	
	Naphthalene	1.152	Solid	30 mg/l	2.74-3.52	-
	Phenanthrene	1.025	Solid	1.6 mg/l	3.72-4.59	-
	Phenol (carbolic acid)	1.0576	Solid	82,000 mg/l	1.24-1.43	
	Pyrene	1.271	Solid	0.16 mg/l	4.22-5.65	+
	Triphenylene	1.302	Solid	0.38 mg/l	4.0-6.9	
BTEX	Benzene	0.878	Liquid	1780 mg/l	1.69-2.00	+
	Ethylbenzene	0.867	Liquid	152 mg/l	1.98-2.41	
	Toluene	0.8669	Liquid	538 mg/l	1.89-2.49	
	m-Xylene	0.8842	Liquid	146-160 mg/l	2.26	
	o-Xylene	0.8802	Liquid	176 mg/l	1.68-1.83	
	p-Xylene	0.8611	Liquid	156-185 mg/l	2.52	
Stretford Solution	Vanadium	6.11	Solid			
	Cadmium	8.642	Solid			
Contaminated Sewer	Mercury	13.534	Liquid			

Table 6.1.3 Hazardous Waste Generation NETL-Morgantown

Waste Stream	Quantity Generated (lbs)	Quantity Shipped (lbs)
Poison (Toxic solids & Liquids)	10	10
Mercury/Mercury Compounds	95	95
Waste Corrosive Liquids	159	159
Waste Solvents/Flammable Liquids	1341	1341
Waste Oxidizers	112	112
Flammable Solids	7	7
Waste Paint	325	325
Toxic Organics	144	144
Other RCRA Compounds	15	15
Fluorescent Light Tubes (Universal Waste)	828	828
Batteries (Universal Waste)	2667	2667
TOTAL	**5703**	**5703**

Table 6.6 Air Emissions Permits – Morgantown Site							
Permits	**Status**	**Exceedance**	**NOVs**	**Sources**	**Pollutants**	**Emissions**	**Criteria**
R13-1768 and 061-00064	Renewed for 2005	None	None	Minor emission sources, GPDU	None.	None.	1440 hours operation per year

Table 6.7.1.a -- NPDES Permit Storm Water Monitoring Requirements			
Outfall	**Pollutants of Concern**	**Limits**	**Frequency**
002			
	Nitrite + Nitrate	0.68 mg/l	6 mo
	Fecal Coliform		6 mo
005			
	Total Suspended Solids	100 mg/l	6 mo
	Fecal Coliform		6 mo
010	BOD	30 mg/l	6 mo
	Total Suspended Solids	100 mg/l	6 mo
	Ammonia	4 mg/l	6 mo
	Fecal Coliform	Report only	6 mo
	pH	9	6 mo
	COD	120	6 mo
010	Oil & Grease	15 mg/l	6 mo

Table 6.7.1.b NETL-Morgantown NPDES Storm Water Analysis Results							
		Outfall 002		**Outfall 005**		**Outfall 010**	
Constituents Cutoff	**Conc.**	**5/20/05**	**8/8/05**	**5/20/05**	**8/8/05**	**5/20/05**	**8/8/05**
Nitrate + Nitrite (Grab)	0.68 mg/L	1.3 mg/L	0.56 mg/L	NS	NS	NS	NS
Ammonia (Grab)	4 mg/L	NS	NS	NS	NS	ND	ND
Fecal Coliform (Grab)	---	180 col/100 mL	>4,000 col/100 mL	510 col/100 mL	>4,000 col/100 mL	2,900 col/100 mL	500 col/100 mL
Total Suspended Solids (Grab)	100 mg/L	NS	NS	23 mg/L	10 mg/L	70 mg/l	290 mg/l
BOD	30 mg/l	NS	NS	NS	NS	ND	4.3 mg/l
pH	9	NS	NS	NS	NS	7.42	8.01
COD	120 mg/l	NS	NS	NS	NS	19 mg/l	30 mg/l
Oil & Grease	15 mg/l	NS	NS	NS	NS	ND	ND

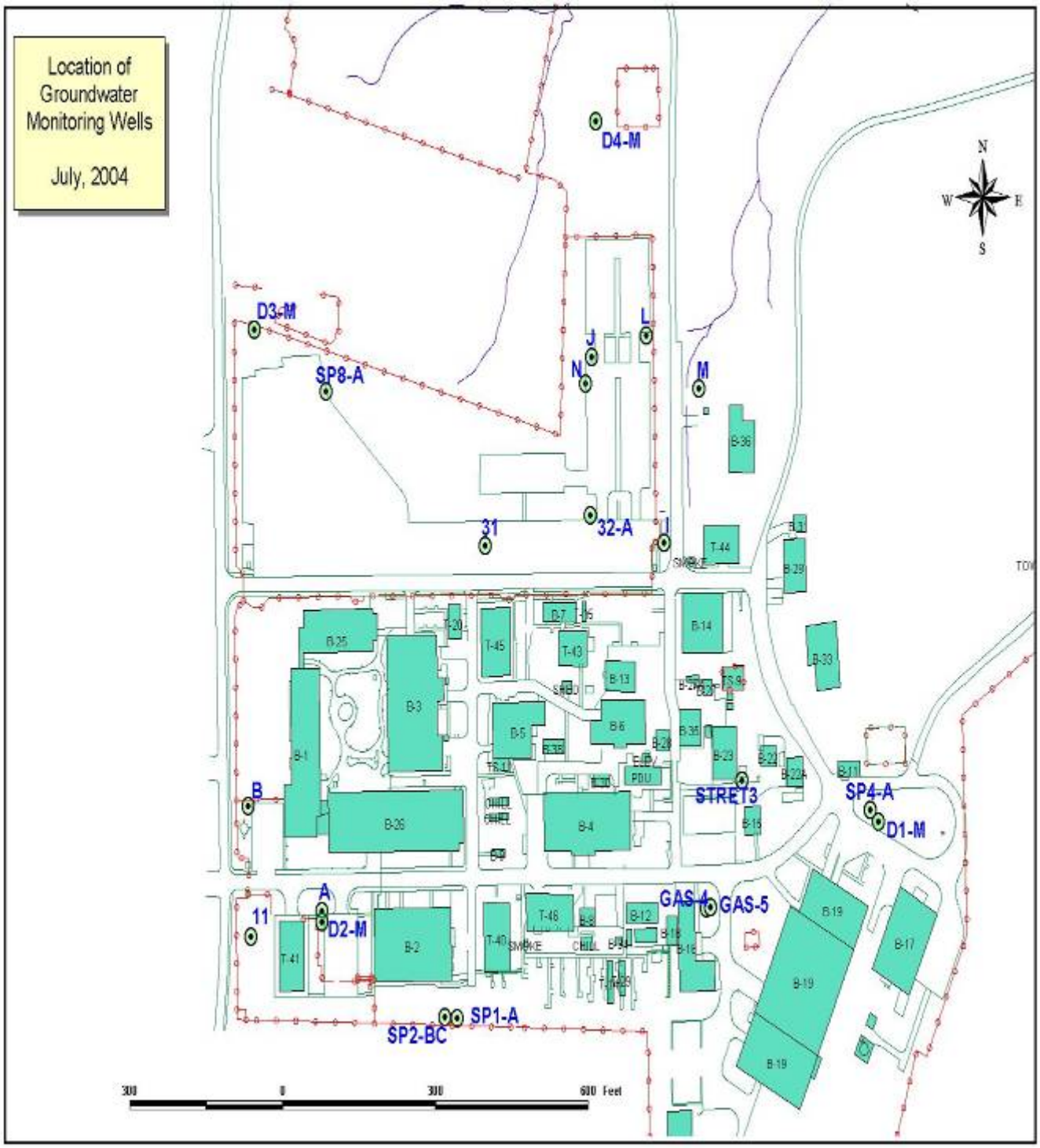
NS = Not Sampled; ND = Not Detected

Table 6.7.1.c NETL-Morgantown 2006 Wastewater Effluent Analysis (lb/d); Pretreatment Permit, Outfall 001, One sample/month													
Parameter	**Limit**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Flow (MGD)													
Monthly Avg	0.09	0.01	0.004	0.003	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.01
Daily Max	0.15	0.04	0.006	0.02	0.03	0.02	0.04	0.04	0.02	0.04	0.09	0.02	0.02
BOD5													
Monthly Avg	None	ND	0.1	0.05	ND	ND	ND	0.3	ND	ND	0.6	ND	0.3
Daily Max	None	ND	0.1	0.3	ND	ND	ND	1.3	ND	ND	1.7	ND	0.6
TSS													
Monthly Avg	None	0.9	0.2	0.3	ND	0.4	ND	1.4	7.3	0.3	ND	ND	ND
Daily Max	None	3.7	0.3	1.7	ND	0.8	ND	5.7	14.6	1.3	ND	ND	ND
Arsenic													
Monthly Avg	0.005	ND	ND	ND	0.0002	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.008	ND	ND	ND	0.0005	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium													
Monthly Avg	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium													
Monthly Avg	0.007	ND	ND	ND	ND	ND	ND	0.002	ND	ND	ND	ND	ND
Daily Max	0.011	ND	ND	ND	ND	ND	ND	0.006	ND	ND	ND	ND	ND
Copper													
Monthly Avg	0.04	0.0007	0.0003	0.0005	0.0007	0.002	0.001	0.002	0.0005	0.0008	0.002	0.0004	0.001
Daily Max	0.06	0.003	0.0005	0.003	0.002	0.003	0.004	0.008	0.001	0.003	0.005	0.0008	0.001
Cyanide													
Monthly Avg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	0.001	0.008	ND	ND
Daily Max	0.03	ND	ND	ND	ND	ND	ND	ND	ND	0.004	0.02	ND	ND
Lead													
Monthly Avg	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.038	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury													
Monthly Avg	0.0006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	0.0009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel													
Monthly Avg	0.01	ND	ND	ND	ND	ND	ND	0.001	ND	ND	0.0003	ND	0.0001
Daily Max	0.015	ND	ND	ND	ND	ND	ND	0.005	ND	ND	0.0008	ND	0.0002
Silver													
Monthly Avg	0.011	ND	ND	ND	ND	ND	0.0007	ND	ND	ND	ND	ND	ND
Daily Max	0.017	ND	ND	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND
Zinc													
Monthly Avg	0.2	0.01	0.002	ND	0.005	0.004	0.006	0.01	0.003	0.004	0.01	0.003	0.004
Daily Max	0.3	0.05	0.003	ND	0.015	0.008	0.02	0.03	0.007	0.02	0.03	0.005	0.008
Iron													
Monthly Avg	None	0.07	0.01	0.01	0.01	0.03	0.02	0.02	0.006	0.008	0.03	0.01	0.02
Daily Max	None	0.28	0.01	0.07	0.04	0.06	0.07	0.08	0.01	0.03	0.09	0.02	0.05
Manganese													
Monthly Avg	None	0.01	0.005	0.009	0.02	0.01	0.01	0.01	0.01	0.007	0.02	0.006	0.02
Daily Max	None	0.02	0.007	0.06	0.05	0.03	0.04	0.03	0.02	0.03	0.06	0.012	0.03
Phenolics													
Monthly Avg	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Daily Max	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 6.7.1.c NETL-Morgantown 2006 Wastewater Effluent Analysis (lb/d); Pretreatment Permit, Outfall 001, One sample/month													
Parameter	**Limit**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Total Organic Halogens	None	0.005	0.002	0.001	0.003	0.003	0.003	0.004	0.002	0.005	0.010	0.005	0.004
Monthly Avg	None	0.021	0.003	0.008	0.008	0.007	0.010	0.016	0.005	0.020	0.029	0.009	0.007
Daily Max													
Organics													
Alachlor-1254	None	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
All others	None	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
pH (s.u.)													
Minimum	6.0	7.6	6.9	7.4	7.1	7.6	7.0	7.3	7.3	7.5	7.2	7.4	7.6
Maximum	9.0	8.1	8.6	8.0	7.9	8.9	8.0	7.7	8.0	8.2	8.0	8.9	8.8

MGD = millions of gallons per day; NS = not sampled; ND = not detected; TSS = total suspended solids; BOD5 = biological oxygen demand for 5-day period; s.u. = standard units

Figure 6.9.1 Active Monitoring Wells at the NETL-Morgantown Site



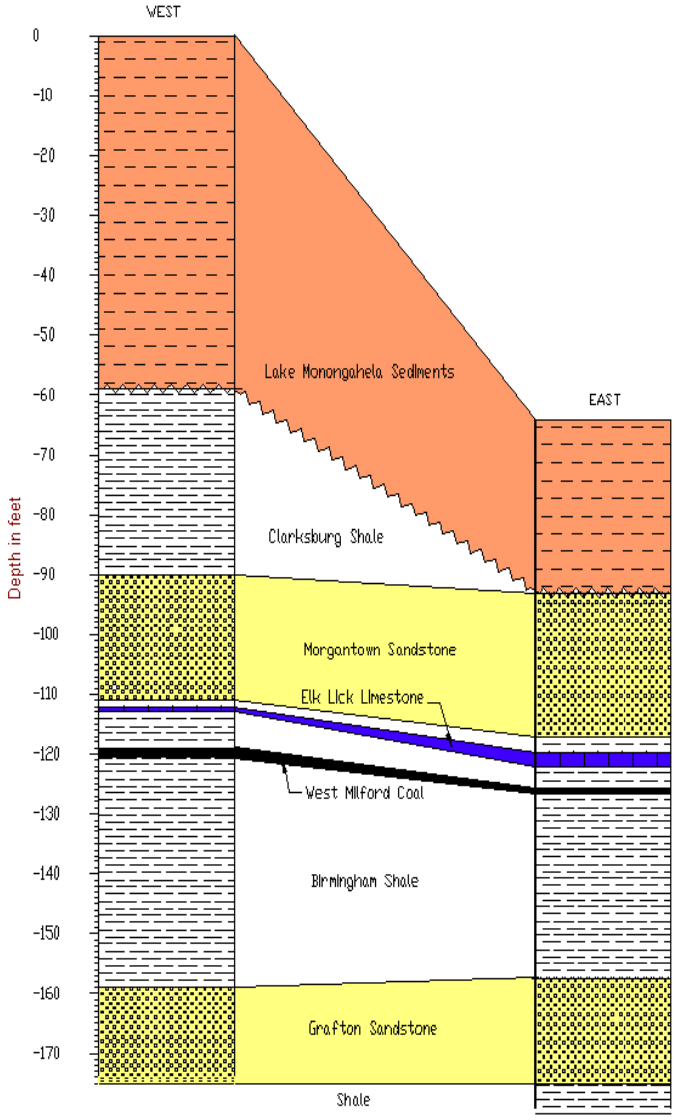


Figure 6.9.2 Generalized cross-section of aquifer units at the Morgantown site.

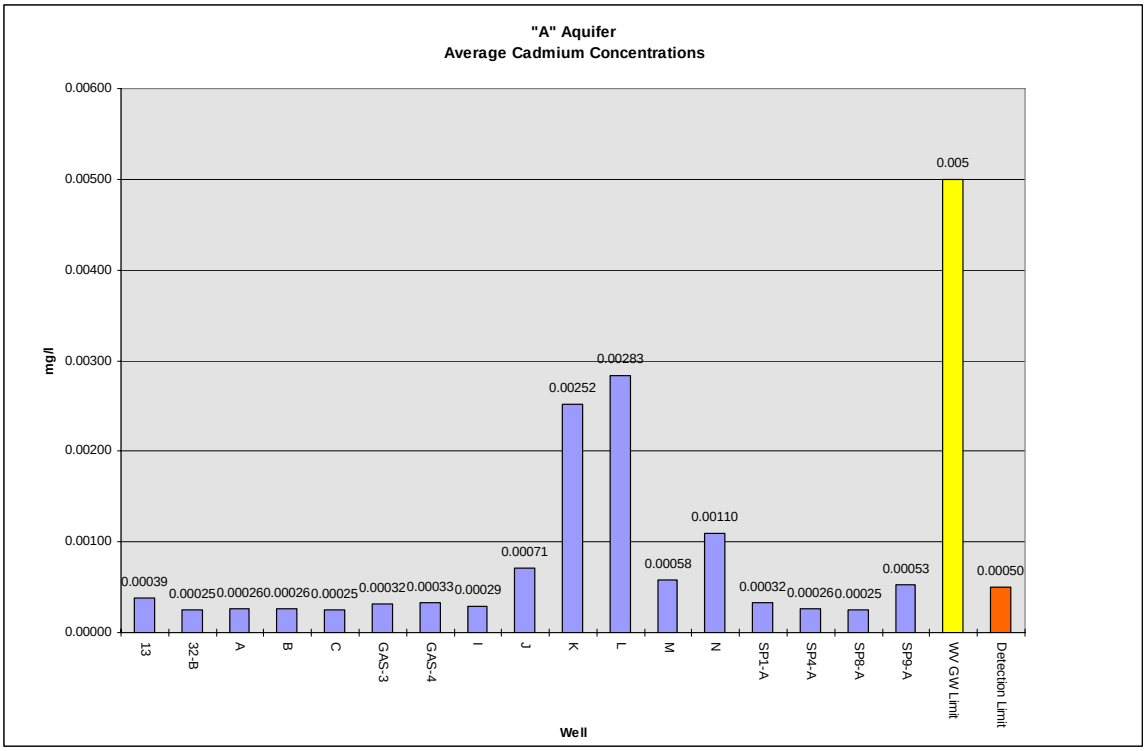


Figure 6.9.3 Average cadmium concentrations in wells, "A" Aquifer, Lake Monongahela unconsolidated sediments.

Table 6.9.1. NETL-Morgantown September 2006 Groundwater Data for "A" Aquifer

			Sample Location												
Parameter	MDL	UNITS	A	B	SP1-A	SP4-A	SP8-A	SP9-A	I	J	K	L	M	N	GAS-4
Benzene	5	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Ethylbenzene	5	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Toluene	5	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Total Xylenes	15	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Benzo(a)pyrene	10	ug/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Silver (total)	0.005	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	ND
Arsenic (total)	0.01	mg/L	ND	0.0039	0.0046	ND	P&A	P&A	0.0137	ND	P&A	0.0053	ND	ND	0.0037
Cadmium (total)	0.005	mg/L	ND	ND	ND	ND	P&A	P&A	ND	0.0012	P&A	0.0156	0.00079	0.0016	ND
Chromium (total)	0.005	mg/L	ND	0.0071	0.0094	ND	P&A	P&A	ND	0.0056	P&A	0.0188	ND	ND	0.0104
Copper (total)	0.025	mg/L	ND	0.0085	0.0116	0.0013	P&A	P&A	0.0017	0.0026	P&A	0.0317	0.0035	0.0022	0.0015
Iron (total)	0.1	mg/L	22.7	40.5	52.2	1.87	P&A	P&A	47	1.26	P&A	19.4	1.24	0.867	17.6
Manganese (total)	0.015	mg/L	1.06	1.35	1.8	0.557	P&A	P&A	0.504	0.212	P&A	0.336	3.36	0.627	2.08

Nickel (total)	0.04	mg/L	ND	0.0064	0.0079	0.028	P&A	P&A	0.0018	0.0791	P&A	0.0605	0.0312	0.101	0.014
Lead (total)	0.003	mg/L	0.0028	0.0079	0.0117	0.0019	P&A	P&A	0.0026	0.0018	P&A	0.0152	0.0032	0.0018	0.0027
Zinc (total)	0.02	mg/L	0.0178	0.044	0.0557	0.019	P&A	P&A	0.0177	0.109	P&A	0.136	0.07	0.175	0.0193
Mercury (total)	0.0002	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	0.00077	ND	ND
Chloride	1	mg/L	0.81	0.96	4.7	37.7	P&A	P&A	45.1	246	P&A	244	65.9	240	87.8
Fluoride	0.05	mg/L	0.03	0.034	0.031	0.063	P&A	P&A	ND	0.027	P&A	0.14	0.16	0.07	0.039
Nitrate Nitrogen	0.05	mg/L	ND	ND	0.39	0.23	P&A	P&A	ND	0.67	P&A	0.71	0.42	0.55	0.049
Sulfate	1	mg/L	17.8	151	40.3	18.4	P&A	P&A	26.2	53.4	P&A	133	75.3	63.9	11.2
Cyanide (total)	0.01	mg/L	ND	ND	0.0046	ND	P&A	P&A	0.0093	ND	P&A	ND	0.0051	0.069	ND
Total Organic Halogen	0.03	mg/L	ND	ND	ND	ND	P&A	P&A	ND	ND	P&A	ND	ND	ND	0.0181
Total Recoverable Phenolics	0.01	mg/L	ND	ND	ND	0.21	P&A	P&A	0.11	ND	P&A	ND	ND	ND	ND
Temperature (field)		deg. C	16.4	17.1	15.3	16.1	P&A	P&A	16.2	16	P&A	16.3	18.6	16.1	16
pH (field)		S.U.	6.5	6.26	6.12	6.11	P&A	P&A	6.46	5	P&A	6.11	3.99	4.39	5.82
Specific Conductance (field)		umhos	253	241	390	291	P&A	P&A	292	917	P&A	1234	412	936	440

ND = not detected; S.U. = standard units; NT = not tested; P&A = well plugged

Table 6.9.2 NETL-Morgantown September 2006 Groundwater Data for "B-C" Aquifer

Parameter	Sample Location							
	MDL	UNITS	11	SP2-BC	32-A	31	GAS-5	STRET-3
Benzene	5	µg/L	ND	ND	ND	ND	ND	NT
Ethylbenzene	5	µg/L	ND	ND	ND	ND	ND	NT
Toluene	5	µg/L	ND	ND	ND	ND	ND	NT
Total Xylenes	15	µg/L	ND	ND	ND	ND	ND	NT
Benzo(a)pyrene	10	µg/L	ND	ND	ND	ND	ND	NT
Silver (total)	0.005	mg/L	ND	ND	ND	ND	ND	NT
Arsenic (total)	0.01	mg/L	ND	ND	ND	ND	ND	NT
Cadmium (total)	0.005	mg/L	ND	ND	0.0015	ND	ND	NT
Chromium (total)	0.005	mg/L	ND	ND	ND	ND	ND	NT
Copper (total)	0.025	mg/L	0.0021	0.0012	0.0034	0.0024	0.0015	NT
Iron (total)	0.1	mg/L	27.5	0.547	ND	0.197	1.45	NT
Manganese (total)	0.015	mg/L	0.936	0.0975	1.15	3.04	0.0441	NT
Nickel (total)	0.04	mg/L	ND	ND	0.0492	0.0323	ND	NT
Lead (total)	0.003	mg/L	0.0028	0.003	0.0031	ND	ND	NT
Zinc (total)	0.02	mg/L	0.0247	0.0168	0.0924	0.0496	0.0228	NT
Mercury (total)	0.0002	mg/L	ND	ND	ND	ND	ND	NT
Chloride	1	mg/L	8.9	7.2	652	199	43.4	NT
Fluoride	0.05	mg/L	0.032	0.082	0.1	0.032	0.14	NT
Nitrate Nitrogen	0.05	mg/L	ND	0.12	1.1	0.31	0.76	NT
Sulfate	1	mg/L	12.2	16.2	108	36.4	28.8	NT
Cyanide (total)	0.01	mg/L	0.0045	ND	0.011	0.015	0.022	NT
Total Organic Halogen	0.03	mg/L	ND	ND	ND	0.0888	ND	NT
Total Recoverable Phenolics	0.01	mg/L	ND	0.0094	ND	ND	ND	NT
Temperature (field)		deg. C	15.3	15.4	20.1	17.7	18.4	NT
pH (field)		S.U.	6.41	6.47	5.02	4.96	6.42	NT
Specific Conductance (field)		µmhos	187	442	2530	741	523	NT

ND = not detected; S.U. = standard units; NT = not tested

Table 6.9.3 NETL-Morgantown September 2006 Groundwater Data for Morgantown Aquifer

Parameter	Sample Location					
	MDL	UNITS	D2-M	D1-M	D3-M	D4-M
Benzene	5	µg/L	ND	ND	NT	ND
Ethylbenzene	5	µg/L	ND	ND	NT	ND
Toluene	5	µg/L	ND	ND	NT	ND
Total Xylenes	15	µg/L	ND	ND	NT	ND
Benzo(a)pyrene	10	µg/L	ND	ND	NT	ND
Silver (total)	0.005	mg/L	ND	ND	NT	ND
Arsenic (total)	0.01	mg/L	ND	0.0079	NT	ND
Cadmium (total)	0.005	mg/L	ND	ND	NT	ND
Chromium (total)	0.005	mg/L	0.0211	0.002	NT	ND
Copper (total)	0.025	mg/L	0.0152	0.0023	NT	0.0037
Iron (total)	0.1	mg/L	9.92	14	NT	10.6
Manganese (total)	0.015	mg/L	0.384	1.49	NT	0.426
Nickel (total)	0.04	mg/L	0.0277	0.0094	NT	0.004
Lead (total)	0.003	mg/L	0.0073	0.0028	NT	0.0019
Zinc (total)	0.02	mg/L	0.0595	0.0608	NT	0.02
Mercury (total)	0.0002	mg/L	ND	ND	NT	ND
Chloride	1	mg/L	0.84	16.6	NT	75.1
Fluoride	0.05	mg/L	0.39	0.053	NT	0.06
Nitrate Nitrogen	0.05	mg/L	0.34	ND	NT	0.71
Sulfate	1	mg/L	1.7	32.3	NT	11.8
Cyanide (total)	0.01	mg/L	ND	0.0051	NT	ND
Total Organic Halogen	0.03	mg/L	ND	ND	NT	ND
Total Recoverable Phenolics	0.01	mg/L	ND	0.7	NT	ND
Temperature (field)		deg. C	15.4	15.6	NT	14.3
pH (field)		S.U.	9.68	6.39	NT	6.34
Specific Conductance (field)		µmhos	660	383	NT	420

ND = not detected; S.U. = standard units; NT = not tested

Table 8.1.2 Tier II Chemical Inventory Reporting List

Chemical Name	CAS	Average and Maximum Daily Amount (lbs)	TPQ (lbs)
Nitrogen (liquid and gaseous)	7727-37-9	49,700	10,000
Nitric oxide	10102-43-9	674	100
Sulfur dioxide	7446-09-5	2,266	500

Table 8.3.1 TSCA Chemicals Held Onsite In Excess Of 10 Lbs.	
Common Name	**CAS**
Naphthalene, 1,2,3,4-tetrahydro-	000119-64-2
Carbon Tetrachloride	000056-23-5
Boric Acid	010043-35-3
Nitric Acid	007697-37-2
Hydrochloric Acid	007647-01-0
N-Hexane	000110-54-3
Sodium Acetate	000127-09-3
Carbon Dioxide	000124-38-9
Ethyl Acetate	000141-78-6
Ferric Chloride	007705-08-0
Methanol	000067-56-1

Table 8.5.1 2006 Radioactive Material (RM) at the Pittsburgh Site				
Isotope	**Qty**	**Activity**	**Supplier/Source**	**NRC License**
Ni-63	2	15 mCi	Gas Chromatograph Electron Capture Device	Held by Hewlett Packard
Cs-137	3	40 mCi (2); 20 mCi (1)	Ronan Engineering Company, Model 137; Level Density Gauge	Held by Parsons
Assorted	80	Consumer Product	Smoke Detectors	Not Required

Table 8.5.2 2006 Other Radiation Generating Devices: X-ray Devices		
Device	**Quantity**	**Location**
X-Ray Tube	1	B-902 Mail Sorting Facility
X-Ray Diffraction Instrument	1	B-94 X-Ray Diffraction Laboratory
Scanning Election Microscope	2 Devices	B-94 Laboratory
Electron Spectroscopy for Chemical Analysis	2 X-Ray Tubes	B-94 Electron Spectroscopy for Chemical Analysis Laboratory

Table 8.6.1 Air Emissions Based on Fuel Usage

Estimated Emissions (Tons/Year)					
Pollutant	**MCCF**	**Combined Boilers**	**Unpaved Roads**	**Paved Roads**	**Total Site**
Carbon Monoxide	0.0	0.122912	0.00306	0.05818	0.184152
Lead	0.0	0.0	0.0	0.0	0.0
Nitrogen Dioxide	0.0	0.14870	0.000025	0.00426	0.153185
Particular Matter <10 micron	0.0	0.00321	0.06302	0.25176	0.317909
Particular Matter Total	0.0	0.002988	0.29491	1.67549	1.973388
Sulfur Dioxide	0.0	0.000892	0.0	0	0.000892
VOCs	0.0	0.008231	0.00021	0.00394	0.012381

Table 8.7.1-- NETL-PGH Industrial Sewer Use Permit (Building 74) Monitoring Analysis

Constituent	**Free Cyanide**	**Phenol**	**Copper**	**Mercury**	**Chloroform**	**pH**
Permit Limit	**< 0.005 mg/L**	**0.025 mg/L**	**0.08 mg/L**	**< 0.0002 mg/L**	**< 5 µg/L**	**6.0 - 9.0 s.u.**
April 05, 2006 Sampling Date						
Building 74 Effluent						
Composite	ND (< 0.0040 mg/l)	ND (< 0.010 mg/l)	ND (< 0.0060 mg/l)	ND (< 0.00020 mg/l)	ND (< 5.0 µg/l)	N/A
Grab #1	N/A	N/A	N/A	N/A	N/A	7.07 s.u.
Grab #2	N/A	N/A	N/A	N/A	N/A	7.50 s.u.
Grab #3	N/A	N/A	N/A	N/A	N/A	7.35 s.u.
Grab #4	N/A	N/A	N/A	N/A	N/A	7.02 s.u.
October 24, 2006 Sample Date						
Building 74 Effluent						
Composite	ND (< 0.0039 mg/l)	ND (< 0.017 mg/l)	0.00071 mg/l	ND (< 0.000047 mg/l)	ND (< 5.0 µg/l)	N/A
Grab #1	N/A	N/A	N/A	N/A	N/A	6.47 s.u.
Grab #2	N/A	N/A	N/A	N/A	N/A	6.48 s.u.
Grab #3	N/A	N/A	N/A	N/A	N/A	6.90 s.u.
Grab #4	N/A	N/A	N/A	N/A	N/A	6.56 s.u.

ND = not detected; s.u. = standard units; mg/L = milligrams per liter; µg/L = micrograms per liter;

Table 8.7.2 -- Building 74 Monthly Monitoring results (mg/l)

Constituent	Permit Limit	01/10 SGS	02/08 SGS	03/08 SGS	04/05 SGS	05/03 SGS	06/14 SGS	07/12 SGS	08/09 STL	09/06 STL	10/24 STL	11/08 STL	12/06 STL
Aluminum	None	2.4	0.71	1.6	0.65	1.2	0.54	0.46	1.79	1.59	0.219	0.142	0.271
Cadmium	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	None	ND	ND	ND	ND	0.0010	ND	ND	ND	0.00087	ND	ND	0.0025
Cooper	0.08	ND	ND	ND	ND	0.00072	ND	ND	ND	ND	ND	ND	0.0019
Cyanide (free)	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOX	None	ND	0.21	0.30	0.074	ND	0.098	ND	ND	ND	ND	0.0401	0.024
Iron	None	0.080	0.15	0.24	0.19	0.10	ND	ND	ND	ND	0.0189	ND	0.107
Lead	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	<0.0002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.000049
Nickel	None	ND	ND	ND	ND	0.0024	ND	ND	ND	ND	ND	ND	0.0014
Oil & Grease	None	ND	ND	ND	ND	9.3	ND	ND	ND	ND	ND	ND	ND
pH (s.u.)	6.0 – 9.0	8.1	6.5	8.4	6.8	6.6	6.7	6.6	7.6	6.8	6.5	6.5	7.2
Phenolics	0.025	ND	ND	ND	ND	ND	ND	ND	0.014	0.0080	ND	ND	ND
TSS	None	12	ND	5.0	ND	6.0	ND	ND	43.6	6.0	ND	ND	ND
Tin	None	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloromethane	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	None	ND	ND	ND	ND	0.030	0.047	ND	0.0088	0.005	0.0139	0.0056	0.0147

ND = not detected; s.u. = standard units; mg/L = milligrams per liter;

Table 8.7.3 -- NETL-PGH 2006 National Pollutant Discharge Elimination System Storm Water Analysis Results

Constituent	Sample Date			
	03/02/06	**06/26/06**	**09/12/06**	**11/07/06**
North Outfall – PGH				
Flow	0.595 MGD	0.177 MGD	0.383 MGD	0.111 MGD
Suspended Solids	950 mg/L	ND (< 10 mg/L)	4.0 mg/L	ND (< 3.4 mg/L)
CBOD5	12 mg/L	ND (< 5 mg/L)	ND (< 2.0 mg/L)	ND (< 0.33 mg/L)
Oil and Grease	9.5 mg/L	ND (< 5 mg/L)	ND (< 0.62 mg/L)	ND (< 0.46 mg/L)
Aluminum	18 mg/L	ND (< 0.10 mg/L)	0.127 mg/L	0.0656 mg/L
Iron	31 mg/L	0.15 mg/L	0.277 mg/L	0.0478 mg/L
Manganese	1.6 mg/L	0.097 mg/L	0.141 mg/L	0.158 mg/L
Lead	75 µg/L	ND (< 10 µg/L)	2.0 µg/L	ND (< 1.5 µg/L)
Mercury	ND (< 0.20 µg/L)	ND (< 0.28 µg/L)	0.066 µg/L	ND (< 0.047 µg/L)
pH	6.91 s.u.	7.64 s.u.	7.85 s.u.	7.65 s.u.
Ammonia	ND (< 1.0 mg/L)	ND (< 0.10 mg/L)	0.75 mg/L	1.4 mg/L
South Outfall – PGH				
Flow	0.563 MGD	0.111 MGD	0.497 MGD	0.354 MGD
Suspended Solids	130 mg/L	30 mg/L	50.8 mg/L	36.8 mg/L
Aluminum	9.2 mg/L	5.2 mg/L	6.7 mg/L	7.84 mg/L
Iron	5.6 mg/L	0.63 mg/L	1.58 mg/L	0.862 mg/L
Manganese	0.50 mg/L	0.65 mg/L	0.512 mg/L	0.693 mg/L
Lead	23 µg/L	ND (< 10 µg/L)	21.6 µg/L	ND (< 1.5 µg/L)
pH	6.75 s.u.	7.81 s.u.	7.73 s.u.	7.38 s.u.
Ammonia	ND (< 1.0 mg/L)	ND (< 0.10 mg/L)	3.6 mg/L	0.19 mg/L

MGD = millions of gallons per day; s.u. = standard units; mg/L = milligrams per liter; µg/L = micrograms per liter; ND = Non Detected.

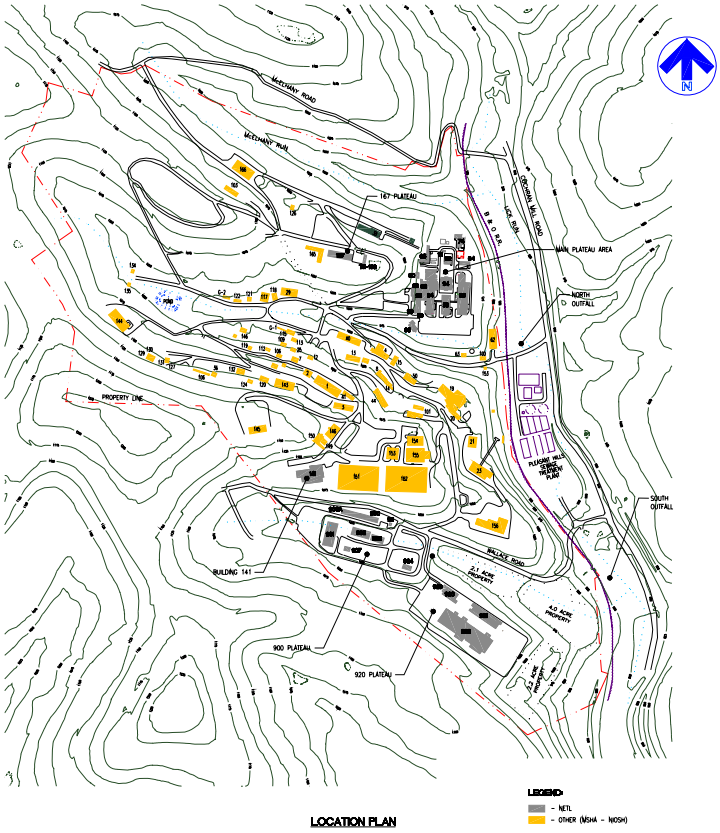


Figure 8.9.1 – Topographic Site Map of NETL Pittsburgh

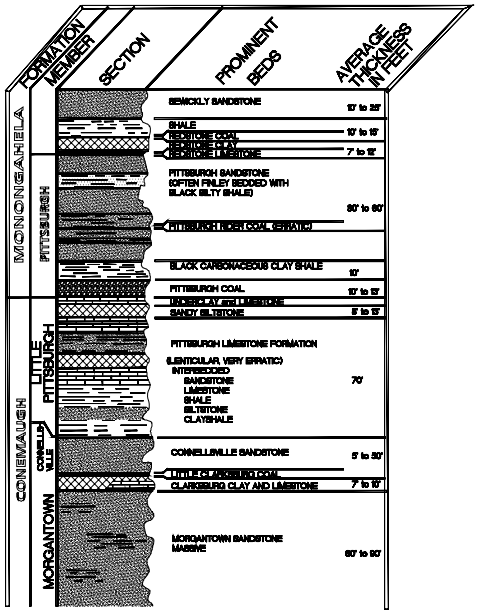


Figure 8.9.2 General Geologic Column

Figure 8.9.3 – NETL-Pittsburgh Groundwater Management Program Main Plateau Well Locations

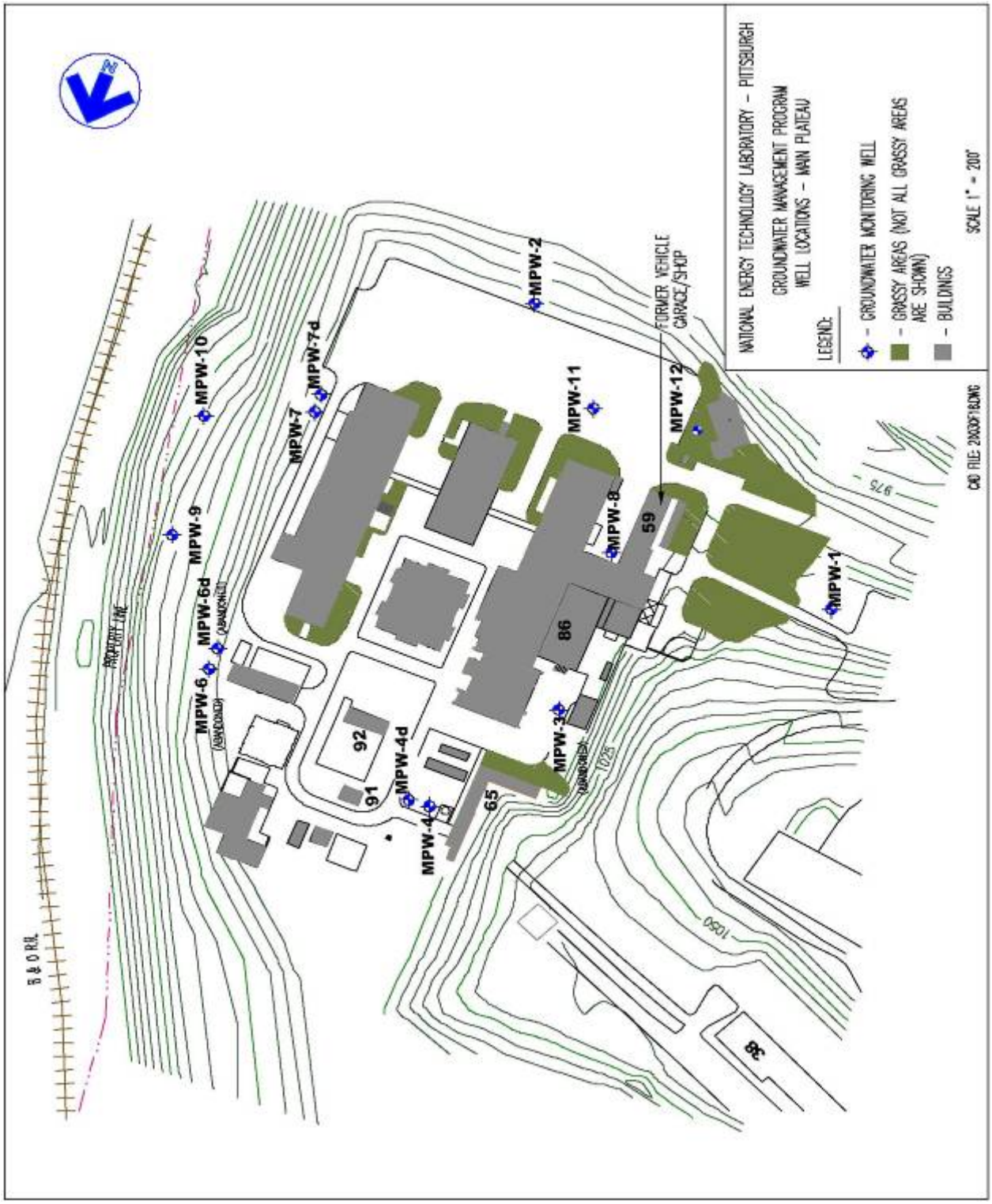


Figure 8.9.4 – NETL-Pittsburgh Groundwater Management Program Valley Fill Well Locations

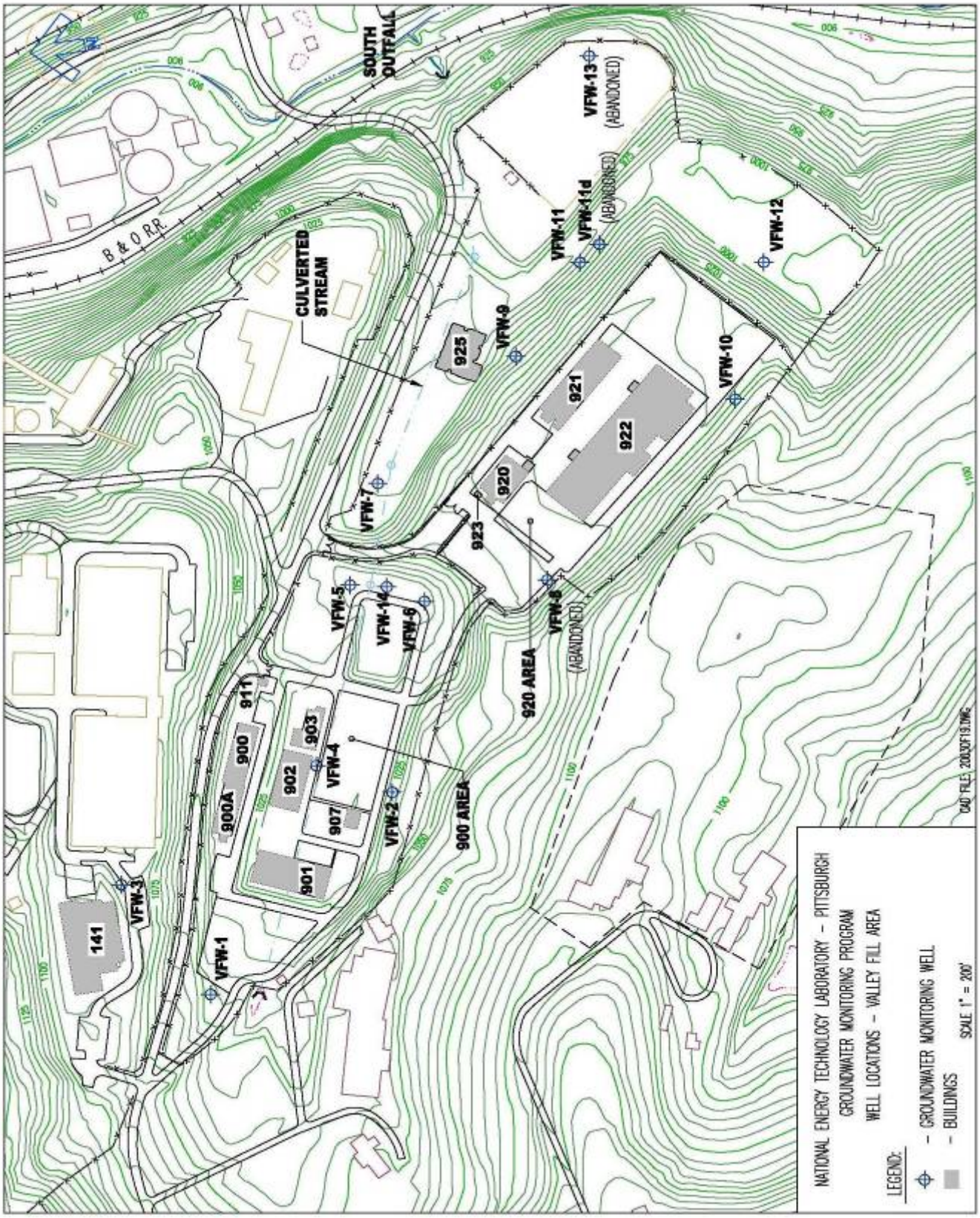


Table 8.9.5 NETL-PGH 2006 Groundwater Detection Monitoring Program

Main Plateau - Volatile Organic Compounds Constituents (µg/L)

Constituent / Sample Date	Well Number					
	MPW-1	MPW-7	MPW-8	MPW-9	MPW-10	MPW-11
	11/01/06	11/02/06	11/01/06	11/01/06	11/01/06	11/01/06
Acetone	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	1.4	1.7
Bromodichloromethane	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	1.7
Chloromethane	ND	ND	ND	ND	ND	ND
Cyclohexane	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	10	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND	ND
Methyl acetate	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	2.1	3.0
Methylcyclohexane	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	ND	ND	ND	ND	ND
Trichlorofluromethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	2.4	ND	ND	ND	ND	ND
Toulene	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND

Constituent / Sample Date	Well Number					
	MPW-1	MPW-7	MPW-8	MPW-9	MPW-10	MPW-11
	11/01/06	11/02/06	11/01/06	11/01/06	11/01/06	11/01/06
Xylenes (total)	ND	ND	ND	ND	ND	ND

ND = Not Detected

	Exceeded EPA Region III Risk Based Table

Table 8.9.6 -- NETL-PGH 2006 Groundwater Detection Monitoring Program Valley Filled - Volatile Organic Compounds Constituents (µg/L)

Constituent / Sample Date	Well Number				
	VFW-2	VFW-3	VFW-10	VFW-14	VFW-14-1
	10/31/06	11/01/06	10/31/06	10/31/06	10/31/06
Acetone	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
Chloroform	ND	1.5	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND
Cyclohexane	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	6.9	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
Isopropylbenzene	ND	ND	ND	ND	ND
Methyl acetate	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Methylcyclohexane	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND	ND
Methyl tert-butyl ether	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	ND	21	ND	ND	ND

Constituent / Sample Date	Well Number				
	VFW-2	VFW-3	VFW-10	VFW-14	VFW-14-1
	10/31/06	11/01/06	10/31/06	10/31/06	10/31/06
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Trichloroethene (TCE)	ND	1.1	ND	ND	ND
Trichlorofluromethane	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ND	ND	ND	ND
Toulene	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND

ND = Not Detected

	Exceeded Pennsylvania Primary Drinking Water MCL and EPA Region III Risk Based Table
	Exceeded EPA Region III Risk Based Table

Table 8.9.7 -- NETL-PGH 2006 Groundwater Detection Monitoring Program Main Plateau - Semivolatile Organic Compounds Constituents (µg/L)

Constituent / Sample Date	Well Number		Constituent / Sample Date	Well Number	
	MPW-1	MPW-7		MPW-1	MPW-7
	11/01/06	11/02/06		11/01/06	11/02/06
Acenaphthene	ND	ND	4,6-Dinitro-2-methlyphenol	ND	ND
Acenaphthylene	ND	ND	2,4-Dinitrophenol	ND	ND
Acetophenone	ND	ND	2,4-Dinitrotoluene	ND	ND
Anthracene	ND	ND	2,6-Dinitrotoluene	ND	ND
Atrazine	ND	ND	Di-n-octyl phthalate	ND	ND
Benzo(a)anthracene	ND	ND	Fluoranthene	ND	ND
Benzo(a)pyrene	ND	ND	Fluorene	ND	ND
Benzo(b)fluoranthene	ND	ND	Hexachlorobenzene	ND	ND
Benzo(ghi)perylene	ND	ND	Hexachlorobutadiene	ND	ND
Benzo(k)fluoranthene	ND	ND	Hexachlorocyclopentadiene	ND	ND
Benzaldehyde	ND	ND	Hexachloroethane	ND	ND
1,1-Biphenyl	ND	ND	Indeno(1,2,3-cd)pyrene	ND	ND
Bis(2-chloroethoxyl) methane	ND	ND	Isophorone	ND	ND
Bis (2-chloroethyl) ether	ND	ND	2-Methylnaphthalene	ND	ND
Bis(2-ethylhexyl) phthalate	ND	ND	2-Methylphenol (o-Cresol)	ND	ND
4-Bromophenyl phenyl ether	ND	ND	4-Methylphenol (p-Cresol)	ND	ND
Butyl benzyl phthalate	ND	ND	Naphthalene	ND	ND
Caprolactam	ND	ND	2-Nitroaniline	ND	ND
Carbazole	ND	ND	3-Nitroaniline	ND	ND
4-Chloroaniline	ND	ND	4-Nitroaniline	ND	ND
4-Chloro-3-methylphenol	ND	ND	Nitrobenzene	ND	ND
2-Chloronaphthalene	ND	ND	2-Nitrophenol	ND	ND
2-Chlorophenol	ND	ND	4-Nitrophenol	ND	ND
4-Chlorophenyl phenyl ether	ND	ND	N-Nitrosodi-n-propylamine	ND	ND
Chrysene	ND	ND	N-Nitrosodiphenylamine	ND	ND
Dibenz(a,h)anthracene	ND	ND	2,2-Oxybis (1-Chloropropane)	ND	ND
Dibenzofuran	ND	ND	Pentachlorophenol	ND	ND
3,3'-Dichlorobenzidine	ND	ND	Phenanthrene	ND	ND
2,4-Dichlorophenol	ND	ND	Phenol	ND	ND

Constituent	Well Number		Constituent	Well Number	
	MPW-1	MPW-7		MPW-1	MPW-7
Sample Date	11/01/06	11/02/06	Sample Date	11/01/06	11/02/06
Diethyl phthalate	ND	ND	Pyrene	ND	ND
2,4-Dimethylphenol	ND	ND	2,4,5-Trichlorophenol	ND	ND
Dimethyl phthalate	ND	ND	2,4,6-Trichlorophenol	ND	ND
Di-n-butyl phthalate	ND	ND			

ND = Not Detected

Table 8.9.8 NETL-PGH 2006 Groundwater Detection Monitoring Program Valley Filled - Semivolatile Organic Compounds Constituents (µg/L)

Constituent	Well Number			Constituent	Well Number		
	VFW-2	VFW-14	VFW-14-1		VFW-2	VFW-14	VFW-14-1
Sample Date	10/31/06	10/31/06	10/31/06	Sample Date	10/31/06	10/31/06	10/31/06
Acenaphthene	ND	ND	ND	4,6-Dinitro-2-methlyphenol	ND	ND	ND
Acenaphthylene	ND	ND	ND	2,4-Dinitrophenol	ND	ND	ND
Acetophenone	ND	ND	ND	2,4-Dinitrotoluene	ND	ND	ND
Anthracene	ND	ND	ND	2,6-Dinitrotoluene	ND	ND	ND
Atrazine	ND	ND	ND	Di-n-octyl phthalate	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	Fluoranthene	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	Fluorene	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	Hexachlorobenzene	ND	ND	ND
Benzo(ghi)perylene	ND	ND	ND	Hexachlorobutadiene	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	Hexachlorocyclopentadiene	ND	ND	ND
Benzaldehyde	ND	ND	ND	Hexachloroethane	ND	ND	ND
1,1-Biphenyl	ND	ND	ND	Indeno(1,2,3-cd)pyrene	ND	ND	ND
Bis(2-chloroethoxyl) methane	ND	ND	ND	Isophorone	ND	ND	ND
Bis (2-chloroethyl) ether	ND	ND	ND	2-Methylnaphthalene	ND	ND	ND
Bis(2-ethylhexyl) phthalate	ND	ND	ND	2-Methylphenol (o-Cresol)	ND	ND	ND
4-Bromophenyl phenyl ether	ND	ND	ND	4-Methylphenol (p-Cresol)	ND	ND	ND
Butyl benzyl phthalate	ND	ND	ND	Naphthalene	ND	ND	ND
Caprolactam	1.3	ND	ND	2-Nitroaniline	ND	ND	ND
Carbazole	ND	ND	ND	3-Nitroaniline	ND	ND	ND
4-Chloroaniline	ND	ND	ND	4-Nitroaniline	ND	ND	ND
4-Chloro-3-methylphenol	ND	ND	ND	Nitrobenzene	ND	ND	ND
2-Chloronaphthalene	ND	ND	ND	2-Nitrophenol	ND	ND	ND
2-Chlorophenol	ND	ND	ND	4-Nitrophenol	ND	ND	ND
4-Chlorophenyl phenyl ether	ND	ND	ND	N-Nitrosodi-n-propylamine	ND	ND	ND
Chrysene	ND	ND	ND	N-Nitrosodiphenylamine	ND	ND	ND
Dibenz(a,h)anthracene	ND	ND	ND	2,2-Oxybis (1-Chloropropane)	ND	ND	ND
Dibenzofuran	ND	ND	ND	Pentachlorophenol	ND	ND	ND
3,3'-Dichlorobenzidine	ND	ND	ND	Phenanthrene	ND	ND	ND
2,4-Dichlorophenol	ND	ND	ND	Phenol	ND	ND	ND
Diethyl phthalate	ND	ND	ND	Pyrene	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	2,4,5-Trichlorophenol	ND	ND	ND
Dimethyl phthalate	ND	ND	ND	2,4,6-Trichlorophenol	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND				

ND = Not Detected

Table 8.9.9 -- NETL-PGH 2006 Groundwater Detection Monitoring Program Valley Fill - TPH Constituents (mg/L)

Constituent	Well Number and Sample Date							
	VFW-2		VFW-4		VFW-7		VFW-10	
Sample Date	05/04/06	10/31/06	05/04/06	10/31/06	05/04/06	10/31/06	05/04/06	10/31/06
TPH-DRO	ND	ND	ND	ND	ND	ND	ND	ND
Constituent	**Well Number and Sample Date**							
	VFW-11		VFW-12		VFW-12-1	VFW-14		VFW-14-1
Sample Date	05/04/06	11/01/06	05/04/06	11/01/06	05/04/06	05/04/06	10/31/06	10/31/06
TPH-DRO	ND	ND	ND	ND	ND	ND	ND	ND

ND = Not Detected; TPH = Total Petroleum Hydrocarbons; TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range Organics.

Table 8.9.10 -- NETL-PGH 2006 Groundwater Detection Monitoring Program Main Plateau - Groundwater Characteristics Constituents

Constituent	Well Number							
	MPW-1	MPW-4	MPW-4D	MPW-7	MPW-8	MPW-9	MPW-10	MPW-11
	11/01/06	11/01/06	11/02/06	11/02/06	11/01/06	11/01/06	11/01/06	11/01/06
Inorganics (µg/l)								
Aluminum	9.8	9.7	12.4	11.4	16.8	12.0	8.2	8.0
Boron	46.3	66.9	191	108	30.2	100	122	67.8
Calcium	305000	334000	4420	209000	604000	33700	1930	217000
Iron	ND	2140	ND	ND	ND	ND	ND	ND
Magnesium	162000	124000	827	26900	109000	9570	327	50600
Manganese	8.3	499	26.1	11.7	105	27.8	3.6	87.3
Nickel	118	806	47.2	300	860	190	ND	37.5
Potassium	3050	5730	745	3580	5110	986	413	3300
Silica	7190	NS	7920	10200	NS	NS	3400	NS
Sodium	100000	175000	227000	187000	453000	148000	195000	246000
Strontium	1280	NS	157	381	NS	NS	370	NS
Quality Parameters (mg/l)								
Chloride	952	989	144	461	2040	149	102	754
Fluoride	0.098	0.094	1.2	0.14	0.21	0.14	0.33	0.19
Nitrate	0.12	0.17	0.049	2.3	0.079	0.28	ND	1.2
Sulfate	118	120	16.0	218	185	17.1	16.8	179
Total Dissolved Solids	2350	2320	581	1330	4190	522	499	1870
Total Alkalinity (Bicarbonate)	255	204	325	198	107	274	279	131
Total Alkalinity (Carbonate)	ND	ND	ND	ND	ND	ND	26.2	ND

NS = Not Sampled; ND = Not Detected.

	Exceeded Pennsylvania Secondary Drinking Water MCL
	Exceeded Pennsylvania Secondary Drinking Water MCL and Act 2 Secondary Maximum Contaminant Level
	Exceeded EPA Region III Risk Based Table

Table 8.9.11 --NETL-PGH 2006 Groundwater Detection Monitoring Program Valley Filled - Groundwater Characteristics Constituents

Constituent	Well Identification and Sampling Date										
	VFW-1	VFW-2	VFW-3	VFW-4	VFW-5	VFW-7	VFW-10	VFW-11	VFW-12	VFW-14	VFW-14-1
	10/31/06	10/31/06	11/01/06	10/31/06	10/31/06	10/31/06	10/31/06	11/01/06	11/01/06	10/31/06	10/31/06
Inorganic (µg/l)											
Aluminum	ND	ND	11.1	ND	ND	15.3	9.1	ND	8.3	11.1	13.7
Boron	248	148	49.3	51.3	311	55.1	71.6	69.9	285	123	150
Calcium	5670	357000	212000	304000	185000	359000	271000	223000	274000	343000	360000
Iron	91.3	2170	ND	101	ND	2970	ND	ND	133	1690	2160
Magnesium	1570	71000	80300	91900	24900	78600	49500	50200	76200	70500	71900
Manganese	12.3	1300	7.4	233	0.31	1400	2180	314	469	2610	1320
Nickel	1.6	ND	42.0	420	ND	ND	31.0	160	468	ND	ND
Potassium	1000	4130	3940	3220	3610	5200	8800	1900	3370	3180	4160
Silica	10400	17400	NS	11300	18700	9860	13600	8450	10100	13700	17700
Sodium	237000	243000	146000	27900	267000	486000	336000	99700	175000	216000	248000
Strontium	439	3570	NS	2080	453	3590	588	477	2750	1710	3550
Quality Parameters (mg/l)											
Chloride	7.6	349	476	608	404	1330	584	395	561	787	360
Fluoride	1.1	0.47	0.18	0.15	0.71	0.055	0.40	0.098	0.33	0.24	0.48
Nitrate	0.023	ND	1.5	0.059	1.3	ND	0.92	0.085	0.26	ND	ND
Sulfate	0.18	829	154	91.3	241	170	418	182	196	198	829
Total Dissolved Solids	561	2220	1410	1390	1380	2830	1960	1160	1690	1620	2230
Total Alkalinity Bicarbonate	517	242	304	295	299	224	237	233	332	261	253
Total Alkalinity Carbonate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NS = Not Sampled; ND = Not Detected.

	Exceeded Pennsylvania Secondary Drinking Water MCL
	Exceeded Pennsylvania Secondary Drinking Water MCL and Act 2 Secondary Maximum Contaminant Level
	Exceeded Pennsylvania Secondary Drinking Water MCL, Act 2 Secondary Maximum Contaminant Level, and EPA Region III Risk Based Table

Table 8.9.12 -- NETL-PGH 2006 Groundwater Detection Monitoring Program Main Plateau - Contamination Indicator Constituents

Constituent	Well Number							
	MPW-1	MPW-4	MPW-4D	MPW-7	MPW-8	MPW-9	MPW-10	MPW-11
	11/01/06	11/01/06	11/02/06	11/02/06	11/01/06	11/01/06	11/01/06	11/01/06
pH (standard units)	7.44	7.15	8.10	7.05	6.94	7.60	9.05	6.94
Specific Conductance	1430	2280	950	1940	6680	900	830	3550
Temperature (^{0}C)	14.0	15.1	13.8	16.1	19.0	12.0	11.6	16.1
TOX (µg/l)	29.7	ND	21.0	18.8	31.0	36.6	ND	63.4
TOC (mg/l)	0.99	1.1	1.2	2.1	0.80	0.79	0.72	1.2

Specific conductance unit = umhos/cm @ 25 EC; ND = Not Detected; TOX = Total Organic Halogens; TOC = Total Organic Carbon

	Exceeded Pennsylvania Secondary Drinking Water MCL

Table 8.9.13 -- NETL-PGH 2006 Groundwater Detection Monitoring Program
Valley Fill - Contamination Indicator Constituents

Constituents	Well Number									
	VFW-1		VFW-2		VFW-3		VFW-4		VFW-5	
	NS	10/31/06	05/04/06	10/31/06	NS	11/01/06	05/04/06	10/31/06	NS	10/31/06
pH (standard units)	NS	8.10	8.11	7.33	NS	6.79	7.00	6.98	NS	7.33
Specific Conductance	NS	760	1940	2480	NS	2490	1400	2370	NS	1690
Temperature (^{0}C)	NS	13.4	12.2	15.4	NS	14.9	16.5	15.9	NS	14.1
TOX (µg/l)	NS	ND	NS	ND	NS	31.9	NS	18.7	NS	ND
TOC (mg/l)	NS	1.7	NS	1.5	NS	1.3	NS	0.85	NS	3.1
Constituents	**Well Number**									
	VFW-7		VFW-10		VFW-11		VFW-12		VFW-14	
	05/04/06	10/31/06	05/04/06	10/31/06	05/04/06	11/01/06	05/04/06	11/01/06	05/04/06	10/31/06
pH (standard units)	6.95	7.15	7.16	7.20	7.64	7.06	7.38	7.04	7.17	6.95
Specific Conductance	5090	3880	1430	2190	1350	1690	1520	2500	2920	2830
Temperature (^{0}C)	15.3	13.7	15.9	15.2	16.7	12.8	15.8	13.7	14.1	14.5
TOX (µg/l)	NS	ND	160	ND	170	ND	NS	27.8	NS	ND/ND*
TOC (mg/l)	NS	1.7	ND	1.8	ND	1.3	NS	4.1	NS	1.7/1.5*

Specific conductance unit = µmhos/cm @ 25 EC; ND = Not Detected; NS = Not Sampled; TOX = Total Organic Halogens; TOC = Total Organic Carbon

- - VFW-14-1

Figure 10.8 – NETL-Albany Groundwater Monitoring Well Network (July 2002)


DEPARTMENT OF ENERGY
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