Office of the Executive Secretariat
IMPORTANT

ES Number: 2006-007625 **Due Date: 08/30/06** **Action Date: 08/16/06**

Subject Summary: Action Memorandum to Deputy Secretary Sell, through MA/Kolb, from US/Orbach. SUBJECT: Site Utilization Management Plan for the Pacific Northwest National Laboratory

Action Requested: Deputy Secretary Sell's approval

Chronology:

08/15 Action Memorandum signed by Under Secretary for Science Orbach
08/15 MA/Spaminato f/Kolb signed at the "Thru" line
08/16 SC sent to ES/Martin for review; completed
08/16 to ES/Cameron to review
08/16 to ES/Matthews f/Solit to review
08/17 to Adam Ingols f/Deputy Secretary Sell's approval at the "Approval" line
08/17 Action signed by Deputy Secretary Sell
08/18 Action pickup by SC
08/1/ Action closed in ES system. gm

From Org: Under Secretary for Science
Officer: Raymond L. Orbach
Alert Information: None
Highlighted Policy: None
Background Information: None

2006-007625

Return folder and contents to the Office of the Executive Secretariat upon completion of action.
Executive Secretariat Contact: Gwenda Martin, 6-4311

Under Secretary for Science
Washington, DC 20585

August 15, 2006

ES2006-007625

MEMORANDUM FOR THE DEPUTY SECRETARY

THROUGH: INGRID KOLB
DIRECTOR
OFFICE OF MANAGEMENT

FROM: RAYMOND L. ORBACH
UNDER SECRETARY FOR SCIENCE

SUBJECT: Site Utilization Management Plan for the Pacific Northwest National Laboratory

ACTION: We request that the Deputy Secretary approve the Site Utilization Management Plan (SUMP) for the operation of the Pacific Northwest National Laboratory

ISSUE: The Office of Science is providing the Site Utilization Management Plan for the Pacific Northwest National Laboratory. The Office of Science is competing the operation of this facility.

DISCUSSION: The attached Site Utilization Plan has been prepared by the Pacific Northwest Site office, Office of Science and addresses the evolving core mission of the Pacific Northwest Laboratory over the next five years.

Acquisition Letter 2000-08 does not require a specific format for the SUMP. An abbreviated format has been adopted for brevity and efficiency in communicating the Pacific Northwest Mission. A more detailed understanding of the key programs and activities can be found in the Pacific Northwest lab Institutional Plan FY 2004-2008, and the Pacific Northwest National Laboratory facility Ten Year Site Plan which covers FY 2007- FY 2016 either of which we will provide upon request.

This SUMP has been fully coordinated with the Office Management and the DOE Procurement Executive, Edward R. Simpson has concurred on its submission.

SENSITIVITIES: None

POLICY IMPACT: None

RECOMMENDATION: Approve the attached Pacific Northwest National Laboratory Facility SUMP. Upon approval, we will complete development of the Request for Proposals (RFP) for the competition for operation of this important scientific facility.

Approved: Clay Sell

Disapproved: _____

Date: 8/17/06

Attachment

Pacific Northwest National Laboratory

Site Utilization And Management Plan
Rev. 0

June 2006

Paul W. Kruger, Manager
Pacific Northwest Site Office

6/15/06
Date

George J. Malosh, Acting Chief Operating Officer
Office of Science

6/23/06
Date

I. Background

This Site Utilization and Management Plan was developed based on the guidance provided within the Department of Energy Acquisition Letter No. 2000-08, Site Utilization and Management Planning, dated August 18, 2000. This plan supplements existing planning documents, and minimizes replicating these plans wherever possible. More detailed information can be found in the following plans utilized in the development of this document:

- Department of Energy Strategic Plan, September 2003
- Office of Science Strategic Plan, February 2004
- Department of Energy Laboratory Plans FY 2007 – FY 2011, March 2006
- Pacific Northwest National Laboratory Work Plan, September 2005
- PNNL Contract Management Plan, July 2005
- PNNL Campus Master Plan Update, July 2005
- PNNL Ten Year Site Plan, June 2006

II. Site Responsibilities under the DOE Strategic Plan

The Pacific Northwest National Laboratory (PNNL) was established in 1965 as part of a reconfiguration of the Department of Energy's Hanford Site in Richland, Washington. Its forerunner, the Hanford Laboratories, was part of the World War II Manhattan Project. PNNL has evolved from a nuclear engineering laboratory dedicated to Hanford operations to a full-fledged multi-program national laboratory and Federally Funded Research and Development Center (FFRDC) focused on scientific discovery and the translation of discoveries into technical solutions to meet national needs. PNNL was designated an Office of Science (SC) Laboratory in 1984.

In 2005 the science and technology mission of PNNL was officially separated from the DOE Office of Environmental Management (EM) mission/goals for Hanford Site cleanup through the establishment of a standalone "PNNL Site." EM is in the process of cleaning up facilities in the 300 Area where EM and SC are coexisting and where much of PNNL's science and technology (S&T) mission work is performed. As part of the closure of the 300 Area PNNL must transition out of the Hanford 300 Area facilities occupied by the Laboratory. As discussed in greater detail later in this section, the PNNL will be constructing new facilities over the next few years to replace capabilities being lost as part of the 300 Area clean up. An initial step in formally separating the EM and SC missions and to provide the land required for the construction of replacement facilities was accomplished when an approximately 130-acre parcel on the southeastern perimeter of the Hanford Site was transferred from EM to SC with SC assuming the roles and responsibilities of Cognizant Secretarial Office (CSO) for this property. The 130 acres includes the 30 acres on which the Environmental Molecular Sciences Laboratory (EMSL) is located. The remaining 100 acres is currently undeveloped and intended as the site to construct the new radiological and support facilities that will fulfill a portion of the space needs to transition out the 300 Area.

Today, PNNL performs approximately $649 million dollars of research annually under the prime contract. PNNL is also home to EMSL, a 200,000-square-foot national scientific user facility. EMSL is central to and leverages PNNL's research and development programs and provides research resources to more than 1,000 non-PNNL users each year from academia, other research and development laboratories, and industry. Another unique scientific facility operated by PNNL is the Research Aircraft Facility (RAF). The RAF, a Battelle-owned Grumman Gulfstream 159 aircraft, is dedicated to the fulfillment of DOE and national goals related to understanding atmospheric processes in the mixed-layer and free troposphere as they relate to the DOE's environmental missions and the global environment. The RAF serves atmospheric scientists at DOE and other federal, state, and industrial laboratories.

The PNNL mission to deliver science-based solutions for the nation's energy, environmental, and security needs crosscuts Goal 5 of the 2003 DOE Strategic Plan to *"provide world-class scientific research capacity needed to: ensure the success of Department missions in national and energy security; advance the frontiers of knowledge in physical sciences and areas of biological, medical, environmental, and computational sciences; or provide world-class research facilities for the Nation's science enterprise."* PNNL is a world center for environmental molecular sciences, as a provider of high-performance tools for computational molecular science and information analytics, and for its capabilities in microbial and cellular biology, environmental sciences, analytical and interfacial chemical sciences, and radiological sciences.

PNNL delivers mission-critical research and development to secure America's future, by providing the scientific and technical basis to:

- Understand and predict the behaviors of complex systems, such as global and regional climates, microbial and other ecologies, and biological systems.
- Detect and prevent the proliferation of weapons of mass destruction (WMD) and potential acts of terrorism.
- Increase domestic energy production to offset the need for foreign oil, through processes for advanced conversions and reducing emissions.

PNNL's scientific discoveries and solutions are directly responsive to DOE and other agency objectives to expand and secure the nation's energy system, ensure national and homeland security, enable and conduct world-class scientific research, and understand and manage the environment. PNNL achieves its mission by maintaining and building new R&D capabilities in terms of staff, facilities, and infrastructure; delivering substantial value to its customers by thoroughly understanding their needs; creating responsive new technologies and capabilities; and creating results that benefit the global scientific community, the northwest region, and the nation.

III. Key DOE Program Offices and Business Lines

As a multi-program laboratory PNNL plays an integral part of the Office of Science, Assistant Secretary for Environmental Management, Assistant Secretary for Energy Efficiency and Renewable Energy, the Assistant Secretary for Nonproliferation and National Security, and the Department of Homeland Security mission accomplishments and has relationships established with Department and other government agencies, as well as private sector and academic concerns.

The Office of Science has identified six core competencies that distinguish PNNL from other national laboratories and will enable PNNL to deliver its mission and customer needs. The identified core competencies are:

- **Microbial and cellular biology** – The microbial and cellular biology core competency includes world-class capabilities in environmental microbiology and applied proteomics. These competencies extend to predictive biology of prokaryotic and eukaryotic systems, analysis of molecular machines, and multispectral and multimodal microscopy.
- **Environmental sciences** – Key capabilities include world-class competencies in biogeochemistry and subsurface science, in climate physics (including global and regional modeling), and in integrated assessment of energy and the environment. PNNL also has competencies in ecosystem science (freshwater, coastal, and arid lands), atmospheric science and chemistry, and carbon management and sequestration.
- **Analytical and interfacial chemical sciences** – This competency includes world-class capabilities in chemical physics, computational chemistry, chemical analysis, and process engineering. PNNL capabilities in interfacial catalysis and functional nanoscale and multiscale materials are on the way to being world-class.
- **Radiological sciences** – PNNL's areas of world leadership in radiological sciences includes radiation detection, radioanalytical chemistry and radiochemical processing, irradiated materials research, and surface and interfacial radiological science. New programs in the discovery of radiation detection materials and in double beta decay and neutrino physics are built on these world-class capabilities.
- **Information analytics** – The strength of PNNL's information analytics competency lies in visual analytics and cyber security, including the growing area of cyber forensics. PNNL capabilities in knowledge discovery, e.g., bioinformatics, scientific data management, data-intensive computing, and the statistics of anomalous events are also strong.
- **Sensing and measurement technologies** – PNNL's capabilities in sensing and measurement are currently directed to security applications, energy systems, environmental monitoring, and industrial applications. PNNL's competencies span a range of the Laboratory's S&T disciplines: nuclear radiation sensors and systems; biological, chemical, and physical sensors and systems; macro-property measurements; and electronic sensors, including controls.

To accomplish the multidisciplinary research required to meet customer needs PNNL has developed four business lines that employ the core competencies noted above. The business lines span fundamental science to technology development and, in some cases, to full-scale deployment. The four business lines are foundational science, energy S&T, national and homeland security, and environmental S&T. Each business line is briefly described below. Additional information regarding the business lines and the supporting product lines can be found within the PNNL Work Plan referenced above.

1. The **Foundational Science** business line delivers new methods, tools, and discoveries to advance the fundamental understanding of physical, biological, and chemical systems underpinning DOE's missions. PNNL is focused on improving the ability to predict the behavior of complex systems from molecular to global scales by building multidisciplinary, multi-institutional teams across the physical, chemical, and biological sciences. The primary customer for PNNL's Foundational Science business line is DOE-SC's Office of Biological and Environmental Research (BER). Other customers include DOE-SC's Office of Basic Energy Sciences (BES) and Office of Advanced Scientific Computing Research (ASCR); the National Institute for General Medical Sciences (NIGMS); and the National Heart, Lung and Blood Institute (NHLBI). This business line requires substantial use of EMSL, the Atmospheric Radiation Measurement (ARM) Climate Research Facility, the Research Aircraft Facility, other DOE complex User Facilities, and the National Center for Research Resources (NCRR) supported Proteomics Research Resource for Integrative Biology.

2. The **Energy Science and Technology** business line supports DOE's mission to use existing energy resources in the most efficient and environmentally acceptable manner possible. PNNL is bridging the gap to advanced energy systems, enabling a more secure and environmentally acceptable carbon-based economy within the existing energy infrastructure, while moving towards a more secure, decentralized infrastructure based on a "smart" grid, fuel cells, biofuels, and, ultimately, a fully integrated hydrogen economy. This business line supports DOE's efforts to reduce America's dependence on foreign oil and develop energy-efficient technologies for buildings, homes, transportation, power systems, and industry. The primary customers for PNNL's Energy Science and Technology business line are DOE Office of Energy Efficiency and Renewable Energy (EERE), Office of Fossil Energy (FE), Office of Nuclear Energy, Science and Technology (NE), and Office of Electricity Delivery and Energy Reliability (OE); secondary customers include NASA, the Nuclear Regulatory Commission (NRC) and private industry. The experimental and computational capabilities in EMSL are essential resources for the elements of this business line at the molecular and nano-scales.

3. The **National and Homeland Security** business line at PNNL supports the U.S. Government's efforts to prevent proliferation of weapons of mass destruction (WMDs), protect our homeland, and ensure a strong and responsive military. The Laboratory's broad range of scientific and engineering expertise enables it to deliver high-impact, science-based, practical solutions to customers. PNNL is meeting the needs of NNSA by preventing and detecting proliferation of WMDs, countering

WMD terrorism, maintaining the nuclear deterrent, and monitoring compliance with nuclear treaties. PNNL brings to bear on these challenges decades of expertise in the technical aspects of nuclear materials production and detection (e.g., the nuclear fuel cycle, weapons material production, environmental monitoring, transuranic waste management, and safeguards, detection, and measurement technologies), as well as in such complex social and technical matters as economic diversification and international relations. PNNL is meeting the needs of the DHS to counter the terrorist threat by developing and deploying technologies that enhance the security, safety, and reliability of the nation's borders and surface transportation systems by stopping illicit materials from entering the U.S. PNNL also provides DoD and the intelligence community with information systems, special equipment, and technology that support military operations, armaments, intelligence, and logistics. The primary customers for PNNL's National and Homeland Security business line are NNSA, DHS, DoD, and the intelligence community. Secondary customers include National Institute for Allergies and Infectious Diseases (NIAID) and private industry. The advanced analytical capabilities in EMSL are an essential resource for this business line.

4. The **Environmental Science and Technology** business line delivers practical strategies and technologies that allow federal and state agencies responsible for managing sensitive ecologies to monitor indicators and respond to a broad set of environmental stressors. This business line provides environmental remediation, subsurface science, and waste management technologies that solve the DOE's challenges effectively to close and provide long-term stewardship for its legacy waste sites. In this area, PNNL provides the scientific and technical basis for developing processes, policies, and regulations that provide necessary protections with greater reliability and efficiency. Beyond cleanup, this business line produces science and technology solutions to monitor environmental change and predict environmental damage from intentional and unintentional insults, providing the basis for rapid response to environmental events and long-term regulation of sensitive ecologies. PNNL also provides science and technology supporting sustainable process engineering for a variety of industries, including chemical, radiochemical, petrochemical, forest products, pharmaceutical, electronics, agricultural, and food production. The primary customers for PNNL's Environmental Science and Technology business line are DOE's Office of Environmental Management (EM), DoD (Corps of Engineers), and the Environmental Protection Agency (EPA). Secondary customers for environmental security and sustainability markets include DHS and private industry. EMSL is an essential resource for the elements of this business line at the molecular and nano-scale and especially for the most complex models of contaminant fate and transport.

The four business lines noted above are aligned with the Laboratory's major customers and are served by 13 product lines that deliver specific products and services in core competency areas. Some of these product lines are almost fully subscribed by one business line; others deliver products and services that serve diverse customers and, therefore, cross multiple business lines. Table 1 below illustrates the alignment and interrelationship of product lines with business lines and primary customers.

Table 1 - PNNL's Major Product Lines, Business Lines, and Customers

	Foundational Science									National & Homeland Security S & T						
	BER	BES	ASCR	NIH	EE	FE	NE	NASA	NRC	NNSA	DHS	NIH	DOD	IC	EM	EPA
Advanced Materials and Manufacturing Applications		○			●		○						○			
Energy Products and Operations					●	●							○			
Process and Measurement Technology		○			●		○			○					●	
Environmental, Safety, and Health Systems				○				○	○		○				●	○
Resource and Ecosystem Management	○				○								●		●	○
Biological and Environmental Sciences	●			●								*	*			*
Material and Chemical Sciences	●	●	○													
Information and Computational Sciences			●	○							●		○	●	○	
Atmospheric Science & Climate Policy Research	●				○											○
Defense Tech. & Logistics Systems (w/Special Analysis)													●	●		
Nonproliferation and Arms Control										●				○		
Nuclear Safety and Technology							●		●	●				○		
Protection, Interdiction and Enforcement Technology											●		●	○		

Indication of Primary (●), secondary (○), and expected (*) customer for our product lines

Because the needs of PNNL clients are constantly evolving, the Laboratory must continually hone and refine identified core competencies in order to sustain relevance of these national assets. PNNL conducts major initiatives to strengthen and evolve its core competencies and refocus these core competencies on the most critical challenges facing our nation. PNNL and its customers are currently investing in six major scientific initiatives to ensure that the core competencies supporting the business lines remain relevant and able to address emerging customer needs that typically cut across multiple agencies. The current major scientific initiatives are in predictive biology, interfacial and nanoscale control of chemical and physical processes, high-performance data-intensive computing, predictive environmental science, energy conversions, and threat detection and prevention. Additionally, a major facility-related initiative is in progress to transition current 300 Area capabilities to new facilities.

Over the next decade through the major initiatives and activities, PNNL plans to deliver real, sustained economic value to the nation by providing the scientific tools, methods, and technologies needed to:

- **Predict, manipulate, and design biological systems**, reducing from weeks to minutes and dollars to cents the requirement for fully characterizing and analyzing a complete proteome, dramatically shortening the timeline for understanding its role in cellular response – similar to experience with the Human Genome Project.

  Expected Scientific Accomplishments
  - An integrated system for global-scale, high-throughput, high-resolution, verifiable analyses of proteins, metabolites, and molecular complexes in a broad range of sample types.

- Instruments and technologies that provide high-resolution, real-time, multi-spectral images of cellular processes that allow linking molecular-scale events to physiological outcomes.
- Computational tools that fuse and analyze characterization information from multiple sources and times and use new techniques to visualize the dynamic nature of the information.
- An approach for discovering useful biomarkers, absent a full mechanistic understanding of complex biological systems.
- Understanding of microbial interactions in humans and microbial communities in the environment to gain insights into health and ecologies, respectively.
- Predictive computer models that simulate essential processes within cells, organs, organisms, and ecologies, and the analytical tools that provides the parameters necessary to create these models.

- **Control chemical and physical processes in nanostructured materials**, increasing the performance of catalytic processes and materials used in energy conversions, carbon capture, and hydrogen storage to meet or exceed current DOE targets.

  Expected Scientific Accomplishments
  - The ability to design new catalytic processes with controlled reactivity and selectivity.
  - New nanostructured materials and deployment systems for hydrogen production and storage.
  - New materials for detection and remediation of dispersed radiological, chemical, and biological agents.

- **Expand the nation's capabilities in high performance, data-intensive computing** to discover unexpected patterns in massive data sets, accelerating scientific discovery in biological and climate systems, and enabling faster and more fruitful analysis of security information.

  Expected Scientific Accomplishments
  - Understanding of the atomic details of energy transduction in biological membranes.
  - Identification of biomarkers for microbial heavy metal sequestration from environmental samples.
  - Establishment of the Leadership Computing Facilities for Biology and Chemistry at PNNL.
  - Establishment of an informatics-driven science paradigm for energy and new materials research.
  - New high-end computational architectures for massive memory and data management that scale to process multi-petabyte data-intensive problems by 2010.
  - New class of visually enabled tools to support collaborative, analytic reasoning about complex, dynamic problems.

- Methods and tools for synthesizing very large amounts of diverse information into representations that reliably reveal themes, meaning, and trends.

- **Predict environmental change and damage**, reducing the uncertainty of current climate modeling sufficiently to save hundreds of millions of dollars from poorly targeted regulations and reducing the assessment time from days to minutes for assessing exposure to toxins or disease.

  Expected Scientific Accomplishments
  - Predictive models for human health responses to selected environmental exposures.
  - Predictive models for the response of ecologies or elements of ecologies (sentinel plants, microbes, animals, etc.) to multiple stressors.
  - Validated, predictive models for climate change at global and regional scales.
  - Mechanistic understandings of chemical phenomena of importance to subsurface fate and transport models (e.g., electron transfer across the mineral-microbe interface).

- **Develop new energy conversion processes** that can be deployed within the current energy infrastructure, replacing 5% of imported oil with domestic hydrocarbon resources.

  Expected Scientific Accomplishments
  - Catalytic and photocatalytic processes with controlled reactivity and selectivity.
  - Novel materials for carbon capture and high-temperature gas separations.
  - Effective computational models of conversion processes from molecular-scale to 3D reactive flow.
  - Biobased processes for production of high-value chemicals and fuels.

- **Develop next-generation threat detection systems**, substantially reducing the proliferation of weapons of mass destruction and terrorist threats.

  Expected Scientific Accomplishments
  - Produce a proven first-principles approach for the discovery and development of new radiation-detection materials and then apply this approach to the development of room temperature, high-resolution, gamma-ray detection materials.
  - Develop ultra low-level detection methods for radiological materials tied to advances in scientific foundations.
  - Develop unmanned aerial vehicle (UAV) sample collection and real-time analysis systems for materials of interest, e.g., signatures of WMD proliferation and terrorist activities.
  - Develop and deploy rapid, low-cost measurement systems for chemical and biological threat materials that employ multi-stage separations and molecular recognition technologies.

- Characterize biomarkers relevant to WMD materials of interest and associated tools and methods to rapidly detect and identify those biomarkers.
- Lead the development and pursuit of a national scientific agenda in the emerging field of visual analytics and engage in broad collaborations that result in new methods and systems being deployed throughout the government. The cornerstone of this work is the National Visualization and Analytics Center and the associated university-led, regional centers.
- Extend and apply these detection and prevention methods to the marine-coastal environment.

- **300 Area Capability Transition**

The most critical issue facing PNNL is the necessity to provide replacement space so that the space it occupies within the Hanford Sites 300 Area can be vacated to facilitate accelerated cleanup of the Hanford Site. Loss of the affected capabilities would adversely affect up to one-third of PNNL's research programs. PNNL's campus currently includes 84 facilities and about 2,000,000 square feet of office and laboratory space scattered across 380 acres in North Richland, Washington. About 33 percent of the total footprint of the Laboratory (~700,000 square feet) is located in the 300 Area of the Hanford Site. These facilities are dedicated to multi-program research and house many capabilities strategically important to the future of PNNL programs conducted for SC, NNSA, DHS, DoD and others.

PNNL has embarked on a Capability Replacement Laboratory (CRL) Project that includes a federal line item to relocate the 700,000 gross square feet of laboratory and office space from the 300 Area into more than 500,000 gross square feet of modern facilities closer to the PNNL's current campus known as the Physical Sciences Facility (PSF). The work to be transitioned into the PSF will be a combination of activities previously performed in separate 300 Area facilities, and a reduction of some previous capabilities. A *Justification of Mission Need* document was approved by the Deputy Secretary on September 23, 2004, as part of Critical Decision (CD)-0. Critical Decision - 1 was approved December 15, 2005; and final transition is expected in early FY2011. The state of Washington is supporting this effort by providing utility infrastructure for the replacement facilities and building a new Bioproducts, Sciences, and Engineering Laboratory on the campus of Washington State University, Richland Washington.

The CRL Project also includes third-party financed facilities. The third-party financing is slated to provide two multi-program laboratory facilities, the Computational Sciences Facility (CSF) and the Biological Sciences Facility (BSF), on privately owned land. If successful, the CSF and BSF facilities will provide approximately 180,000 net square feet of commercially constructed space. The Laboratory has recently issued a request for proposals (RFP) for Development Teams (Developer, Architect-Engineer, and Constructor as applicable) to plan; finance; design and construct; and lease the CSF and BSF multi-program laboratory facilities. The overall Site and infrastructure to support PNNL missions/programs is discussed in further detail within Section VI of this plan.

- **Local Considerations**

The Pacific Northwest National Laboratory (PNNL) has been a presence in the Tri-Cities since the inception of the Laboratory in 1965. The Laboratory is well respected by the community. Laboratory personnel are significant participants in various local activities from having staff members or Laboratory leadership serving on major boards or committees, to supporting fund raising activities, to providing support for the arts. The Laboratory's operating contractor is well thought of in the community and reports having contributed an estimated $7.5 million in corporate funds locally and regionally during the period October 2001 through June 2006. Laboratory leadership has historically supported and encouraged employee volunteerism.

Additionally, PNNL has developed sound relationships with Washington State University (WSU) Tri-Cities, Columbia Basin College in the Tri-Cities, the University of Washington in Seattle, and the Oregon University System. For example, the Laboratory is working jointly with WSU to build and operate the new Bioproducts, Science, and Engineering Laboratory (BSEL) on the WSU Tri-Cities campus in Richland. Another example is the Laboratory partnership with the Oregon University System for collaborative research and educational opportunities in genomics, nanoscience and technologies, radioisotopes, and water resource management.

The Laboratory is the second largest non-state government employer in Eastern Washington behind only Fairchild Air Force Base near Spokane. The Laboratory employs approximately 4,200 people with an estimated annual local payroll in excess of $280 million. Table 2 below shows the top seven employers in the immediate Tri-Cities area.

Table 2 – Seven Largest Employers [(a)] in Tri-Cities Area

Employer	Business	No. of Employees
Battelle/PNNL	Research Laboratory	4,178
Fluor Hanford, Inc.	Hanford Contractor	3,499
Bechtel National, Inc.	Hanford Contractor	1,858
Tyson Fresh Meats	Meat Packing	1,800
ConAgra/Lamb-Weston	Food Processing	1,685
Kadlec Medical Center	Hospital	1,313
CH2M Hill Hanford Group, Inc.	Hanford Contractor	1,136

(a) Information from Tri-City Industrial Development Council, January 2006

Fiscal year 2005 saw an estimated $726 million dollars of research conducted at the PNNL under the prime contract in addition to private work under the Use Permit. Approximately $250 million is used in purchases during the fiscal year and a fifth or more of that goes to vendors in the state.

The PNNL has continued to experience positive support from the highest levels of local and state government and is seen locally as the future of the Department of Energy's presence in the Tri-Cities "post-clean up" of the Hanford Site. As a result local government, local economic development groups, and the state's Congressional delegation quickly and enthusiastically voice their support and opinions on issues affecting growth potential at the PNNL.

IV. Current and Planned Budget

PNNL Management and the PNSO works closely with each of the Laboratory's customers to understand program needs and to position the Laboratory to effectively support its assigned mission responsibilities. It is anticipated that demand for PNNL's services over the next five years will result in funding growth across most of PNNL's business lines and missions. A summary of the current PNNL contract budget and the budget projections through FY 2012 are depicted in Table 3 below.

Table 3 - PNNL Contract Budget Projections FY2006 through FY2012

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CF	Office of the Chief Financial Officer	300,066	434,782	496,300	499,836	396,422	364,257	347,510
CN	Office of Counterintelligence	0	0	0	0	0	0	0
EE	Assistant Secretary for Energy Efficiency and Renewable Energy	28,925	28,457	30,112	30,604	30,910	32,280	32,987
EH	Assistant Secretary for Environment, Safety, and Health	625	688	688	688	688	688	702
EM	Assistant Secretary for Environmental Management	130	0	0	0	0	0	0
FE	Assistant Secretary for Fossil Energy	13,150	13,551	14,550	16,338	16,702	17,402	17,783
IM	Office of the Chief Information Officer	2,537	2,613	2,697	2,796	2,882	2,956	3,021
IN	Office of Intelligence	0	0	0	0	0	0	0
NA	Administrator for National Nuclear Security Administration	141,837	134,249	140,351	140,608	127,478	118,746	120,627
NE	Office of Nuclear Energy, Science & Technology	17,750	11,700	6,000	6,450	7,750	7,750	7,751
RW	Office of Civilian Radioactive Waste Management	1,210	2,500	2,500	3,000	3,000	3,000	3,000
SC	Office of Science	119,818	128,354	182,734	168,125	161,051	163,112	215,452
SP	Office of Security and Safety Performance Assurance	3,443	3,903	4,139	4,415	4,827	5,006	5,104
TA	Office of Technical Analysis	6,518	7,434	7,904	8,455	9,268	9,613	9,799
VC	Office of Verification and Control	9,723	11,093	11,792	12,611	13,827	14,344	14,621
OE	Office of Electricity Delivery and Energy Reliability	3,888	5,346	6,804	8,261	9,719	10,691	10,926
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* Funding decrease primarily due to the projected end of the DHS funded Radiation Portal Monitoring Program.

- **Reduced Funding Contingencies**

  - Research Programs – Because of broad and diverse programmatic sponsors, PNNL could mitigate the effects of reduced funding in particular programs through pursuing efficiencies and using the flexibility that exists within program appropriations. Significant funding reductions would result in analysis of staffing and work priorities and evaluate appropriate alternatives or reductions.

- CRL Project – Risk management planning has occurred for the project and will be updated as the project progresses. Early risk planning identified reduced funding, loss of participation of a funding partner, or delayed funding as potential risks. Such scenarios could result in major impacts to the project in providing facilities available for occupancy and operations by the required endpoints of PNNL occupancy in the 300 Area facilities. Delays in CRL project facility startups could impact the Hanford Site River Corridor Contract facility release phases managed by DOE-RL. Current contingency planning for the early stages of the CRL project primarily relies on frequent, effective communication with appropriate stakeholders to identify problems early and allow time for alternatives to be developed.

V. Management Approach

The following is a discussion of the methodology utilized to implement an effective team approach to managing the PNNL contract through effective communications and coordination, and provide the appropriate level of contract management commensurate with the level of complexity of the contract and involvement by the PNSO, DOE HQ SC, SC Integrated Support Center (ISC), other cognizant HQ Program Offices, and major customers, throughout the term of the contract. This management approach is established within the PNNL Contract Management Plan (Rev. 1), published July 2005. The Contract Management Plan (CMP) describes the processes that the PNSO utilizes to assure that the terms and conditions of the Laboratory contract (contract no. DE-AC05-76RL01830) are met by the contractor and DOE. The processes addressed are those necessary to 1) fulfill the Government's contract management responsibilities and 2) ensure that the Contractor's performance is adequately monitored and documented. This responsibility is carried out utilizing the appropriate PNSO processes and procedures to produce desired results, prioritize activities, and build confidence and satisfaction among customers, Tribal Nations, regulators, and stakeholders. In addition, the CMP also addresses how Government actions should be appropriately implemented and documented.

The PNSO has primary responsibility for providing workscope direction to the Contractor and provides contract management, performance oversight, and contract administration activities as appropriate. As the line organization responsible for the performance oversight and administration of the Laboratory contract, all PNSO communications with formal direction (with the exception of items that are the exclusive responsibility of the ACO/CO) is issued to the Contractor through the ACO, CO, or COR as appropriate.

The PNSO Manager has been designated as the Administrative Contracting Officer (ACO) for the PNNL Contract and along with the Contracting Officer (CO) is the focal point for all contract actions. Special assistance in managing the PNNL contract is provided by the Federal Project Director for the CRL project and the Defense Contract Audit Agency (DCAA). The PNSO Federal Project Director is responsible for the overall project management activities for all discrete projects under the Site Office's

cognizance in accordance with the roles, responsibilities, authorities and accountabilities defined within DOE M 413.3-1 "Project Management for the Acquisition of Capital Assets." The DCAA, under the authority, direction, and control of the Under Secretary of Defense (Comptroller), is responsible for performing contract audits for the DOE, and providing accounting and financial advisory services regarding the PNNL prime contract (1830), Use Permit (1831), and subcontracts for PNSO contract administration activities. The specific roles and responsibilities for the above, as well as others, who support the management of the PNNL contract, are provided within Section 3.0 of the CMP and can also be found within the PNSO Roles, Responsibilities, Accountabilities, and Authorities document, dated October 2004.

The contract utilizes a performance-based management system, monitored through an Assurance Process (which includes self-assessment among other things), and the Goal and Objectives within the Performance Evaluation and Measurement Plan (PEMP). The PEMP identifies end-states, drive customer-negotiated performance expectations and incentivize work activities. The PEMP includes all agreed Performance Measures/Targets between DOE and the contractor. The PEMP is developed in accordance with the Office of Science Laboratory Appraisal Process.

PEMP reporting and performance management is comprised of those activities that facilitate the documentation of evidence that work activities are progressing as planned. Annual Peer Review and Operational Awareness are key elements of the performance management process. Operational Awareness is maintained by continuous PNSO monitoring of contractor activities and performance of work.

PEMP performance assessment and reporting are a critical part of the performance management strategy. Each performance measure contained within a PEMP Objective is tracked throughout the performance period and data indicating the success in meeting the expected outcome (target level) of each measure is documented. The final PEMP reporting process provides a formal means for DOE to document and communicate to the contractor the level of performance achieved and incentives earned during the performance period. This system ensures that the Contractor is properly motivated consistent with DOE missions, values, and the achievement of the strategic outcomes. The PNSO's approach to fee administration is discussed further within the CMP.

Authorization to the Contractor to proceed with work is provided through approved work authorization (multi-year work plans, work authorization statements, interoffice work orders, request for services, etc.) for the work elements in the SOW or, as appropriate, revisions to the plans. Work is not authorized to commence until the Contractor receives both funding (via a contract modification) and the related work authorization guidance. In support of the SC roles and responsibilities, the PNSO provides work authorization to the contractor for DOE, other federal agencies, and non federal entities. Authorization of work is conducted in accordance with the terms and conditions of the PNNL contract, the PNSO Proposal & Work Authorization Approval Procedure, the PNSO Work For Others Procedure, and is consistent with DOE O 412.1, Work Authorization System, DOE P 450.4, Safety Management System Policy, DOE O 226.1, Implementation of the Department of Energy Oversight Policy, DOE O 481.1B,

Work For Others (Non-Department of Energy Funded Work), and DOE N 481.1A, Reimbursable Work for the Department of Homeland Security.

All work, current or new, must be within the Laboratory "Operating Envelope" as defined within the Contract Statement of Work. The overall operating envelope defines the general operating principles, authorized hazard levels and nature of classified work for the Laboratory. Research operations beyond the established envelope limits require review by DOE and may require a modification of relevant Contract terms and conditions. A graded approach to establishing requirements and oversight of work is applied to assure proper control of classified and hazardous work without imposing unnecessarily burdensome requirements on low risk activities or facilities.

VI. Site Infrastructure and Facilities Planning

1. Description of Laboratory Site/Facilities

The Laboratory consists of office, laboratory, and support facilities principally located in Richland, Washington, and Hanford's 300 Area. Other laboratory facilities included as part of the PNNL are located in Sequim, Washington. Some additional office space included in the consolidated laboratory is located in Seattle, Washington; Portland, Oregon; Washington D.C.; and at the University of Maryland. As discussed above the S&T mission of PNNL was officially separated from the DOE Office of Environmental Management (EM) mission/goals for Hanford Site cleanup in FY 2005 through the establishment of a standalone "PNNL Site."

PNNL is unique within the DOE system in that it combines DOE national laboratory facilities and equipment with contractor privately funded facilities and equipment under the "Consolidated Laboratory" concept. Under the Consolidated Laboratory concept, work conducted under the prime contract can be performed in both government-owned and Contractor-owned/leased facilities while the government pays the Contractor for the reasonable costs of using the private facilities and equipment. In addition, a special clause within the current prime contract (H-1 "Use of Facilities for Contractor's Own Account") allows the Contractor to utilize designated facilities and other Government-owned property in its custody to conduct research and development activities for its own account, to the extent and in accordance with the terms and conditions set forth within the Use Permit No. DE-GM05-00RL01831, dated June 2004, while fully compensating the government for such use, as well as, any materials, supplies, utilities, labor or services provided by DOE or at DOE expense. Such compensation is determined in accordance with charges, rates and schedules agreed upon by DOE and the Contractor.

The Richland campus is located near the west bank of the Columbia River at the northern boundary of the City of Richland. This site exclusive of the 300 Area, which represents the PNNL Site, is approximately 380 acres – 130 acres DOE-owned land and 250 acres Battelle and other owned. The 130 acres of DOE-owned land consists of 30 acres where the Environmental Molecular Sciences Laboratory (EMSL) is located and 100 acres for the "Horn Rapids Triangle" land directly north

of Horn Rapids Road and EMSL. Approximately 4,000 PNNL staff members currently conduct and support research activities on a campus composed of over 2 million square feet, most of which are located within the Richland campus. About 33 percent of the total footprint of the Laboratory (~700,000 square feet) is located in the 300 Area of the Hanford Site, slated for deactivation, decontamination, and demolition by 2015. Total ownership breakout is shown in Table 4 below.

Table 4 - PNNL Real Property by Location

Location/Category	Area (Sq Ft) Millions	Number of Individual Buildings or Complexes[a]
DOE-Owned	0.764	21
Battelle-Owned (Richland)	0.450	31
Battelle-Owned (Sequim)	0.043	9
Leased Facilities	0.793	22
Other	0.033	1[b]
Total	**2.083**	**84**

(a) For the purposes of this table, a complex of sub-buildings is considered one building. FIMS data capture individual buildings and structures.
(b) The Consolidated Information Center on the WSU Tri-Cities Campus.

An aerial view of most of the PNNL occupied facilities is shown in Figure 1 below. Specific information regarding the facilities both government and privately owned as well as leased is provided within the current PNNL Ten Year Site Plan, dated May 2005.

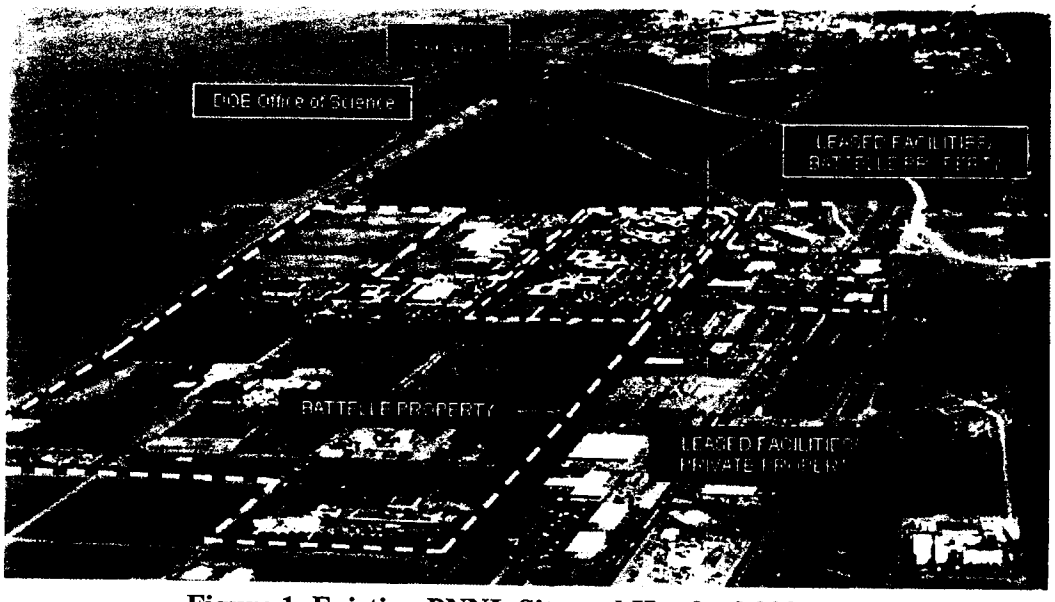

Figure 1. Existing PNNL Site and Hanford 300 Area

2. **Site and Facilities Plans**

It is anticipated that the current facilities (DOE owned and Battelle owned/leased) described in sub-section 1 above will be required in order to meet future mission requirements. In addition the Laboratory must transition capabilities being displaced by the accelerated cleanup of the Hanford Site 300 Area into new facilities on the PNNL Site. Exit from the 300 Area is currently planned for the middle of FY 2011. Currently SC is leading a joint effort with the National Nuclear Security Administration (NNSA) and the Department of Homeland Security (DHS) to provide the necessary replacement space on a time schedule that would prevent disruption of ongoing programs.

The Capability Replacement Laboratories Project (CRL) will provide the facilities to transition those capabilities lost due to the 300 Area closure to include nuclear capabilities. The CRL will generally be acquired through a combination of line item capital funding, General Plant Project (GPP) and Institutional General Plant Project (IGPP) funding, and private financing consistent with the existing PNNL M&O contract. A Justification of Mission Need document was approved by the Deputy Secretary on September 23, 2004, as part of Critical Decision (CD)-0 and a "Final Mission Needs Validation Report in Support of the PNNL Capability Replacement Laboratories Project" was issued to the Laboratory February 25, 2005, identifying the capabilities to be used as the programmatic basis for the CRL conceptual design. The report validated the need to replace eleven of the thirteen research capabilities affected by the 300 Area closure. Also during FY 2005 a conceptual design and other documentation necessary to support CD-1, Approve Alternative Selection and Cost Range was completed and CD-1 was approved by the Deputy Secretary on December 15, 2005. Construction of new facilities is expected to begin in FY 2008. The primary facilities included in the CRL and the general plan for their acquisition and financing are as follows:

a) The **Physical Sciences Facility (PSF)** – an approximately 325,000 gsf facility for physical and radiological sciences, including a Hazard Category 3 nuclear facility, to be financed using line item funding, located on federal property, with estimated completion in mid FY 2011 under the PSF Project.

b) The **Biological Sciences Facility (BSF)** – an approximately 90,000 gsf facility for biological sciences to be financed using private financing, located on Battelle property, with estimated completion by FY 2008.

c) The **Computational Sciences Facility (CSF)** – an approximately 90,000 gsf facility for computational sciences to be financed using private financing, located on Battelle property, with estimated completion by FY 2008.

d) The **Life Sciences Facility (LSF)** – an approximately 40,000 gsf facility for life sciences using private financing, located on Battelle property, and with estimated completion by FY 2008.

e) The **Maintenance and Fabrication Support Facility (MFSF)** – an approximately 15,000 gsf facility for craft services to be financed using IGPP funding, located on federal property, with estimated completion by FY 2009 by the PNNL M&O (Battelle).

In summary the Laboratory is facing a critical challenge regarding its capabilities from a facilities perspective over the five year period of FY 2006 to FY 2010, largely as a result of the closure of the 300 Area of the Hanford Site. These capabilities are the basis for the S&T which the Laboratory delivers to its customers and sustaining and enhancing Laboratory facilities is critical for the success of PNNL strategy to be World Class.

VII. Contractual Management and Configuration

The nature of the PNNL mission is such that it cannot be met by existing DOE in-house personnel or by traditional FAR-based contract procedures. The diverse research and development missions of the Laboratory require a long-term relationship that provides continuity and allows the Laboratory to attract and retain the best and brightest scientific and management personnel. Only a Federally Funded Research and Development Center (FFRDC) can provide the long-term relationship necessary to the Department missions. The cost-plus award-fee, performance-based Management and Operating (M&O) contract includes all the criteria outlined under FAR 35.017-1 that are required for an FFRDC.

The current DOE Prime Contract (DE-AC05-76RL01830) with Battelle Memorial Institute is a cost-plus award-fee, performance-based M&O contract subject to the appropriate provisions of the FAR and DEAR. The current contract term expires September 30, 2007. The Contractor is responsible for the management and operation of the Laboratory program/projects, maintaining and enhancing the facilities, business systems, infrastructure, and assuring that Laboratory capabilities are able to meet current and future government science and technology needs.

Use of the concepts of performance-based contracting within the PNNL contract began with the incorporation of the eleven elements of contract reform in the mid-1990s and continued through the development of the current contract, signed on August 26, 2003. The PNNL contract reflects the application of performance-base contracting approaches and techniques which emphasize results/outcomes and minimize "how to" performance descriptions. The contractor has the responsibility for total performance under the contract, including determining the specific methods for accomplishing the work effort, performing quality control, and assuming accountability for accomplishing the work under the contract. Accordingly, the performance-based management contract provides flexibility, within the terms and conditions of the contract, to the contractor in managing and operating the Laboratory.

To the maximum extent practical the performance-based management contract 1) describes the requirements in terms of outcomes or results required rather than the methods of performance of the work; 2) uses a limited number of systems-based

measurable performance standards (i.e., terms of quality, timeliness, quantity, etc.) to drive improved performance and increase effective and efficient management of the Laboratory; 3) provides for appropriate financial incentives (e.g., fee) when performance standards and contract requirements are achieved; 4) specifies procedures for reduction of fee when services are not performed or do not meet contract requirements; and 5) include non-financial performance incentives where appropriate. Beginning with FY 2006 SC restructured the performance appraisal process for evaluating laboratory contractor performance and determining performance-based fee and other incentives. This new process increases comparability, consistency and transparency; better tailors incentives to motivate different types of contractors; and will generate better information for extend/compete decisions. This new process has been established through the annual Performance Evaluation and Measurement Plan (PEMP) and is the primary contractual performance measurement mechanism by which DOE evaluates contractor performance and subsequently determines the total fee earned.

It is anticipated that future contracts for the management and operation of the PNNL will continue the performance-based management contracting concepts/methodologies as described above and in accordance with current FAR and DEAR regulations. There may be opportunities to breakout certain laboratory site functions for DOE-direct small business contracts. However, the core laboratory functions, and certain laboratory site functions, must remain under the M&O contract in the direct control of the M&O contractor in order for the laboratory mission to be accomplished in an effective manner.