

The Department of Energy



Former Worker Medical Screening Program

Annual Report

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Foreword

Among the worker health programs that have been revitalized by the Office of Health, Safety and Security (HSS), one of the most significant is the Energy Department's Former Worker Medical Screening Program, otherwise known as the Former Worker Program (FWP). Through outreach and medical screening activities, this program has provided extremely valuable diagnostic health information to numerous former workers since the program began in 1996. The FWP identifies, notifies and makes medical screening services available to the more than 600,000 former employees who have worked in the weapons complex during the past 60 years for the Department of Energy or its predecessor agencies. Medical screening examinations are designed to check for adverse health effects related to occupational exposures and are conducted by dedicated medical experts from consortia of universities, unions, and commercial organizations with expertise in administration of medical programs. Most participants examined have been found to be healthy; however, those with medical findings have been referred for medical follow-up or referred to the Department of Labor's Energy Employee Occupational Illness Compensation Program, which compensates DOE employees for occupational illnesses.

HSS has developed stronger and more effective relationships with the Labor Department and the National Institute for Occupational Safety and Health to increase the effectiveness of programs addressing the health care of former workers, and enhancing assistance to all eligible workers who have had exposures to radiation and other toxic substances. In addition to the obvious benefits to workers and former workers, this initiative is having a positive impact on health care costs.

Even with HSS's positive outreach, many former workers still have not enrolled in this program, either for initial medical screening or for re-screening after their initial evaluation. HSS will redouble its efforts to reach out to these former workers and to assist all the workers who wish to take advantage of the program's benefits. The FWP demonstrates the Department's commitment to those workers who served our nation through the important work conducted by the Department of Energy and its predecessor agencies.

HSS is committed to the safety and health of our workforce and will ensure continued support of this important program. It is important that our current workers are aware that the Department will not forget those who previously worked here. Equally important is that the current workers know that they too will be eligible for the program's benefits after they leave the Department. We, together with the consortia, will work together to strengthen the program through current and planned programmatic enhancements identified in this report. This report is a testimony of our collective commitment to all those who served our nation through the important work conducted by the Department of Energy and its predecessor agencies.

Glenn S. Podonsky
Chief Health, Safety and Security Officer
U.S. Department of Energy

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Executive Summary

The U.S. Department of Energy (DOE) Former Worker Medical Screening Program, otherwise known as the Former Worker Program (FWP), provides for the conduct of ongoing medical screenings for former DOE workers to identify adverse health conditions that may have resulted from working at DOE facilities. Mandated by Congress in the Defense Authorization Act of 1993 (P.L. 102-484), the FWP provides medical screening, including examinations, to check for adverse health effects that could be related to radiation, noise, beryllium, asbestos, silica, lead, cadmium, chromium, solvents, and other occupational exposures. In addition, a limited number of health assessments are provided for personal health conditions, such as blood sugar, blood cholesterol, blood pressure, and smoking, without significantly impacting the overall cost of the program.

The program, managed by the DOE Office of Health, Safety and Security, uses independent occupational health experts through cooperative agreements held by consortia of universities, labor unions, and commercial organizations throughout the United States with expertise in administration of medical programs. Initiated in 1996, the FWP now provides medical screening services at all DOE sites for the more than 600,000 former Federal, contractor, and subcontractor employees who ever worked for the Department or its predecessor agencies. As of December 2008, over 360,000 former workers have been contacted, and over 55,000 medical screening examinations have been provided to those who volunteer to participate in the program. In addition, follow-up re-screening exams have been provided to over 7,300 former workers.

The approach that DOE has used to establish and implement the FWP has resulted in recognition of the program's high degree of credibility by former workers, participating physicians and other medical providers, and other U.S. Government agencies, such as the Department of Labor. The program's strengths center on the use of the best available, evidence-based approach to determine possible causality of disease; the involvement of national occupational medicine leaders and use of independent organizations to administer the medical screenings; aggressive and multi-faceted outreach programs; uniformity of protocol and equity of access across DOE sites; and a respect for the confidentiality and protection of former worker medical screening information.

DOE intends to further improve upon the demonstrated strengths of the FWP by continuing to enhance communications with participants, current workers, and other stakeholders, including other government agencies such as the Department of Labor and the National Institute for Occupational Safety and Health; streamlining FWP project protocol review processes to improve the efficiency of operations; and focusing attention on programmatic issues requiring periodic review. Finally, DOE will also explore additional ways that the FWP can benefit former workers and will further examine the use of computed tomography for cancer screening purposes within the FWP.

This annual report provides an update to the 2007 report summarizing the work that has been conducted since the inception of the FWP.

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1.0 Introduction

The purpose of this report is to provide an overview of the history, goals, accomplishments, and future direction of the U.S. Department of Energy (DOE) Former Worker Medical Screening Program, or Former Worker Program (FWP). DOE places the highest priority on continuing the work of the FWP as required by the Defense Authorization Act of 1993 to establish and carry out a program for the identification and ongoing medical evaluation of its current and former employees who may be subject to significant health risks from possible exposure to hazardous or radioactive substances. The Department has developed the programmatic and institutional infrastructure to provide initial medical screening that is available to all DOE workers. This infrastructure includes designated regional centers located near major DOE sites. In addition, DOE expanded the program in 2005 to include the National Supplemental Screening Program, which provides medical screening services to former DOE workers from sites not covered by a regional project or workers who no longer live in close proximity to the regional screening clinics. This supplemental program ensures that all former DOE workers have ready access to screening, regardless of their previous worksite or location. This nationwide, comprehensive network of over 10,000 health clinics in close proximity to most workers' residences, constructed through considerable effort by DOE in conjunction with universities and other organizations, represents tangible evidence of the Department's commitment to its former workers.

The FWP is managed by the Department's Office of Health, Safety and Security (HSS). The FWP applies basic principles and a state-of-the-art methodology of general medical screening tests to a set of occupational health conditions that arise among DOE workers in order to provide detection of work-related diseases and conditions at an early stage, allowing for successful treatment. This program directly benefits former DOE workers by promoting early identification of health problems and improving the understanding of health risks that former workers may face because of possible workplace exposures during their prior employment with DOE.

Since 1996, DOE has made great strides in addressing the occupational health legacy of its 50 years of nuclear weapons design and production. The Department has successfully demonstrated the feasibility and value of conducting targeted medical screening programs for occupational diseases among DOE workers by using third-party medical experts who provide high-quality services, resulting in high credibility with worker populations. These screening programs have been extremely responsive to the directives of Congress and to the needs and concerns of DOE workers.

While this program focuses on former workers, current DOE workers are routinely screened either through the onsite medical clinics or through contracted services provided by offsite vendors. For example, beryllium workers receive medical evaluations annually, and workers who were exposed to beryllium in the past receive testing every three years.

The DOE FWP also plays a vital role in assisting efforts undertaken by Congress and the Department to address the needs of DOE workers. In 2000, Congress passed the Energy Employees Occupational Illness Compensation Program Act (EEOICPA), administered by the Department of Labor (DOL), to compensate current and former workers for illness and injuries that resulted from their work at DOE facilities. The DOE FWP complements EEOICPA, as it provides former DOE workers with medical evaluations conducted by expert occupational medicine physicians and laboratories who provide both the workers and the claims examiners with objective information for decision-making about the appropriateness of compensation.

“As a former worker at Lawrence Livermore National Laboratory, I spent my early years handling highly radioactive and toxic materials. This was during a time of evolving health and safety standards so, for personal reasons, I am happy to be able to participate in this medical monitoring program. I also think it’s important to add to the larger picture about occupational exposures and their relationship to developing diseases we know about such as cancer and lung disease. As a free and confidential program with great potential benefit for many, I encourage all Lab retirees to contact one of the representatives and, as appropriate, become a part of the study.”

- Participant, Medical Screening Program for Former Workers of Lawrence Livermore, Lawrence Berkeley, and Sandia National Laboratories

1.1 Historical Background

From the earliest days of the Manhattan Project in the 1940s, DOE and its predecessor organizations, the Atomic Energy Commission (AEC) and the Energy Research and Development Administration (ERDA), developed a nuclear weapons arsenal through a nationwide industrial complex working with hazardous materials and processes. The nuclear weapons industry was unlike any other industry. The nuclear weapons complex and its committed workers, under the heightened threat of nuclear conflict, worked with a sense of secrecy and urgency. Equally important is the fact that they worked in close quarters, in many cases, with a variety of occupational hazards for several decades prior to the emergence of modern health and safety regulations including DOL’s Occupational Safety and Health Administration, which was not established until 1971. Moreover, affected individuals seeking medical treatment and/or workers’ compensation were not adequately informed regarding their occupational exposures and thus could not obtain the most targeted, and therefore most effective, screening available.

As the Cold War ramped down in the early 1990s, the U.S. Government realized it had a commitment to remediate its nuclear production facilities and address the health risks of the more than 600,000 former construction and production workers who had been involved in the nuclear weapons programs.

To address the legacy of the Cold War era and to ensure that current and future workers would be provided a higher level of protection, Congress and DOE implemented three major programs: 1) establishing medical screening for former DOE workers; 2) compensating former DOE workers who had developed diseases as a result of working at DOE facilities; and 3) implementing new regulations concerning worker safety to ensure that mistakes of the past were not repeated.

The first of these programs was initiated in 1992, when Congress passed the Defense Authorization Act of 1993. Section 3162 of this Act authorized DOE to:

“...establish and carry out a program for the identification and on-going medical evaluation of its current and former employees who are subject to significant health risks as a result of the exposure of such employees to hazardous or radioactive substances during such employment.”

While Section 3162 called for DOE to develop a program to provide ongoing medical evaluations for former workers of defense nuclear facilities, the FWP was expanded in 2005 to include all former DOE Federal, contractor, and subcontractor workers from all DOE sites.

Accordingly, the FWP provides a process to:

- a. Identify the hazardous substances and radioactive substances to which former workers employed by DOE and its subcontractors may have been exposed as a result of such employment.
- b. Identify former workers employed by DOE and its subcontractors who may have been exposed to hazardous or radioactive substances in the course of their employment.
- c. Determine the appropriate number, scope, and frequency of medical evaluations and laboratory tests to be provided to former workers employed by DOE and its subcontractors who may have received a level of exposure with significant health risks.
- d. Make the evaluations and tests available to program participants.
- e. Inform program participants of compensation benefits that might be available to them.
- f. Ensure that privacy is maintained and protected with respect to medical information that personally identifies any program participant.
- g. Ensure that participation in the program is voluntary.

The simplicity and common sense conveyed by Section 3162 belied the challenges that DOE faced in bringing this directive to reality. The primary challenges have been: 1) identifying and locating the vast number of former workers who had worked within the DOE complex but were no longer employed; 2) overcoming the distrust of former workers who felt that DOE had deceived them about the nature of the risks that they faced; and 3) bringing the needed occupational health expertise to DOE communities, most of which are located in rural areas with few, if any, occupational medicine physicians.

From the start, DOE recognized that a special approach would be needed for some groups, especially for construction workers who had been employed intermittently by subcontractors. For many of these workers, DOE had no records of employment or even of the employers, and therefore the only way to reach these workers was through the unions where they were members. In addition, exposure records for these workers are likely not to exist or to be incomplete, making it difficult to determine overall exposure levels. Therefore, the screening programs for these workers had to follow a model, in which the first step was a detailed work history interview made specifically for construction work tasks. Interviews were used to establish the kinds of risks to which these workers had been exposed, so that medical exams could be tailored to those risks.

Two pilot projects for construction workers—Hanford and Oak Ridge—were started in 1996 by CPWR - The Center for Construction Research and Training (formerly the Center to Protect Workers' Rights, CPWR) and the University of Cincinnati Medical Center using identical protocols. In 2005, these two individual projects were merged into one national program now called the Building Trades National Medical Screening Program. The protocols have now been adopted to cover construction workers from 23 DOE facilities.

DOE has forged unique relationships with universities, labor groups, and organizations with expertise in administration of medical programs throughout the country to administer the FWP protocol. A debt of gratitude is owed to these organizations for their dedication to this program:

- Atomic Trades and Labor Council
- Boston University School of Public Health
- CPWR - The Center for Construction Research and Training
- Comprehensive Health Services
- Creative Pollution Solutions, Inc.
- Drexel University
- Duke University Medical Center
- Johns Hopkins Bloomberg School of Public Health
- Medical University of South Carolina
- National Jewish Health
- Oak Ridge Associated Universities
- Occupational Health Link
- Queens College of the City University of New York
- University of California, San Francisco
- University of Cincinnati Medical Center
- University of Colorado Health Sciences Center
- University of Iowa College of Public Health
- University of Texas Health Science Center at Tyler
- United Steelworkers
- Zenith Administrators.

“*The Medical Screening Program is a program we can't afford not to be a part of. It's a first-class operation. We do whatever it takes to get our members involved because it helps them avoid health risks down the road.*”

- Participant, Building Trades National Medical Screening Program

1.2 Program Description

The FWP has four interrelated program goals:

1. Identify and contact DOE workers who may have been exposed to hazardous substances in the course of DOE employment.
2. Conduct appropriate medical screening of former workers who wish to participate in the program.
3. Provide information and assistance to affected workers in gaining medical care and compensation for work-related illnesses.
4. Use the collected information to implement controls for current operations in order to prevent or reduce negative health effects for current and future employees.

These goals have the dual effect of demonstrating DOE's fulfillment of Congress's mandate and gaining the confidence of its workforce that it is both meeting its obligations to former workers and protecting its current workers from preventable injury and illness.

In designing and conducting the FWP, the Department has purposefully integrated a set of core principles that promote program excellence by:

- Ensuring that the medical aspects of the program are designed and overseen by occupational medicine experts
- Employing a broad range of outreach methods to ensure maximum participation of former workers

- Utilizing state-of-the-art medical screening techniques and analyses, when appropriate
- Ensuring the confidentiality and safeguarding of workers' personal and medical data.

At the inception of the program, the FWP included two major components: 1) a needs assessment phase to identify groups of at-risk workers and site-specific exposures of concern; and 2) a medical screening phase, which included notifying members of the at-risk groups and providing medical screening examinations for interested individuals. Since the program was expanded in 2005, medical screenings are available to all concerned former Federal, contractor, and subcontractor workers. The health conditions that are targeted through a uniform national medical protocol are chronic lung disease and other major organ damage that may be associated with occupational exposures to such hazards as noise, radiation, beryllium, asbestos, silica, welding fumes, lead, cadmium, chromium, and solvents.

In addition, the program examines workers for common non-occupational health problems, focusing on blood sugar (diabetes), cholesterol (coronary artery disease), blood pressure (cardiovascular disease), and smoking (heart and lung disease and cancer). This is not intended to be a comprehensive examination but to complement the screening services to some degree without significantly impacting the cost of the exam.

To initiate efficient and inclusive screening programs, HSS has worked with DOE Headquarters program offices to obtain rosters of former employees from site contractors and DOE site offices. Invitations are sent to employees on the rosters, using the most recently known addresses. When addresses are found to be outdated or inaccurate, supplemental methods are used; these include Internal Revenue Service mailings or address-update services. A second method of reaching out to former DOE workers is through personal contact and program visibility within DOE communities. Building and Construction Trade Councils, construction contractors, and local unions are also involved in identifying potential FWP participants. The labor unions that have been actively involved in the FWP employ, in many instances, former workers who serve as local outreach coordinators to contact individuals, attend group meetings (e.g., retiree clubs, Lions Clubs, fairs), contact local media, and publish articles in union newsletters to increase awareness of the FWP. Newspaper ads and public service radio announcements are also used. These outreach methods have the added benefit of making current workers and families of DOE workers aware of this beneficial activity undertaken by DOE. DOL has also assisted with outreach in the past by providing FWP information to their claimants on behalf of DOE.

The medical screening examinations delivered by a network of over 10,000 medical clinics are comprehensive and include physical examinations, occupational and medical history questionnaires, chest x-rays with interpretation for occupational lung disease (B reading), spirometry, beryllium lymphocyte proliferation tests (BeLPT), blood chemistry tests, urinalyses, and audiometry tests. In addition, at certain sites, workers with a history of additional exposures have received specialized testing (e.g., bladder cancer testing at Oak Ridge K-25, mercury exposure testing for construction workers at Oak Ridge Y-12, silicosis testing at the Nevada Test Site).

All medical information that is collected as part of this program is treated as confidential and is used only as allowed by the Privacy Act of 1974, and all FWP activities are conducted with the approval of the Institutional Review Boards (Human Subjects Committees) of DOE and involved universities. All individuals sign an informed consent and Health Insurance Portability and Accountability Act (HIPAA) authorization prior to participation.

“*The entire process was very professional and very timely run. I appreciated the exam and the expeditious way that I received the results. To be truthful I don't know how you can improve your current system. It was a nice change from the 1/2 to 1 hour wait in my doctor's office. Thanks.*”

- Participant, Pantex Former Worker Medical Screening Program

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2.0 Program Strengths and Accomplishments

2.1 Program Strengths

The approach that DOE has used to establish and implement the FWP has resulted in recognition of the program's credibility by former workers, participating physicians and other medical providers, and other U.S. Government agencies, such as DOL. The strengths are:

1. Use of the best available, evidence-based approach to determine possible occupational causality of disease
2. Independence of project consortia
3. Aggressive and multi-faceted outreach programs
4. Involvement of national leaders in occupational medicine and use of world-renowned medical institutions knowledgeable with respect to respiratory diseases
5. Uniformity of protocol and equity of access across DOE sites
6. Respect for the confidentiality of former workers' medical screening information.

“A program employee was at a local supermarket when a past program participant called her over and asked her if she recognized him. “Don't you recognize me? Your Program saved my life, you know.” The former worker continued to tell the employee that the program referred him to his personal physician because of a discrepancy in his physical exam. Turns out he had colon cancer and had just had his last chemotherapy treatment.”

- Participant, Medical Exam Program for Former Workers from Los Alamos and Sandia National Laboratories

2.2 Achievement of Stated Goals

Each FWP team focuses on a distinct subset of the former worker population to:

- 1. Identify and contact DOE workers who may have been exposed in the course of DOE employment.**

Workers eligible for this program include all former DOE Federal, contractor, and subcontractor employees from all facilities, not just those involved in the nuclear weapons program. A map showing DOE sites where regional projects have been initiated is presented in Figure 1. Sites where regional projects have not yet been set up are covered by the national programs for screening construction and production workers.

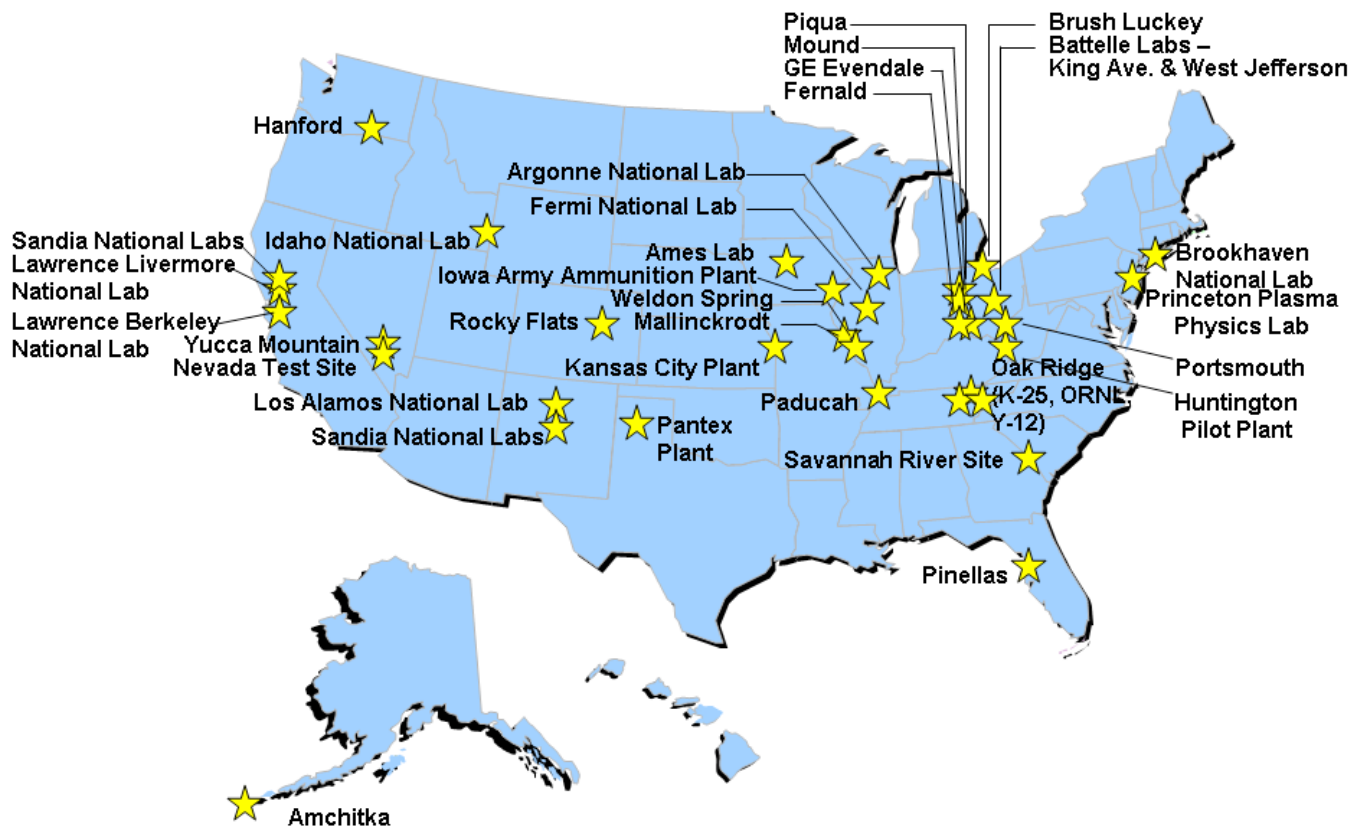
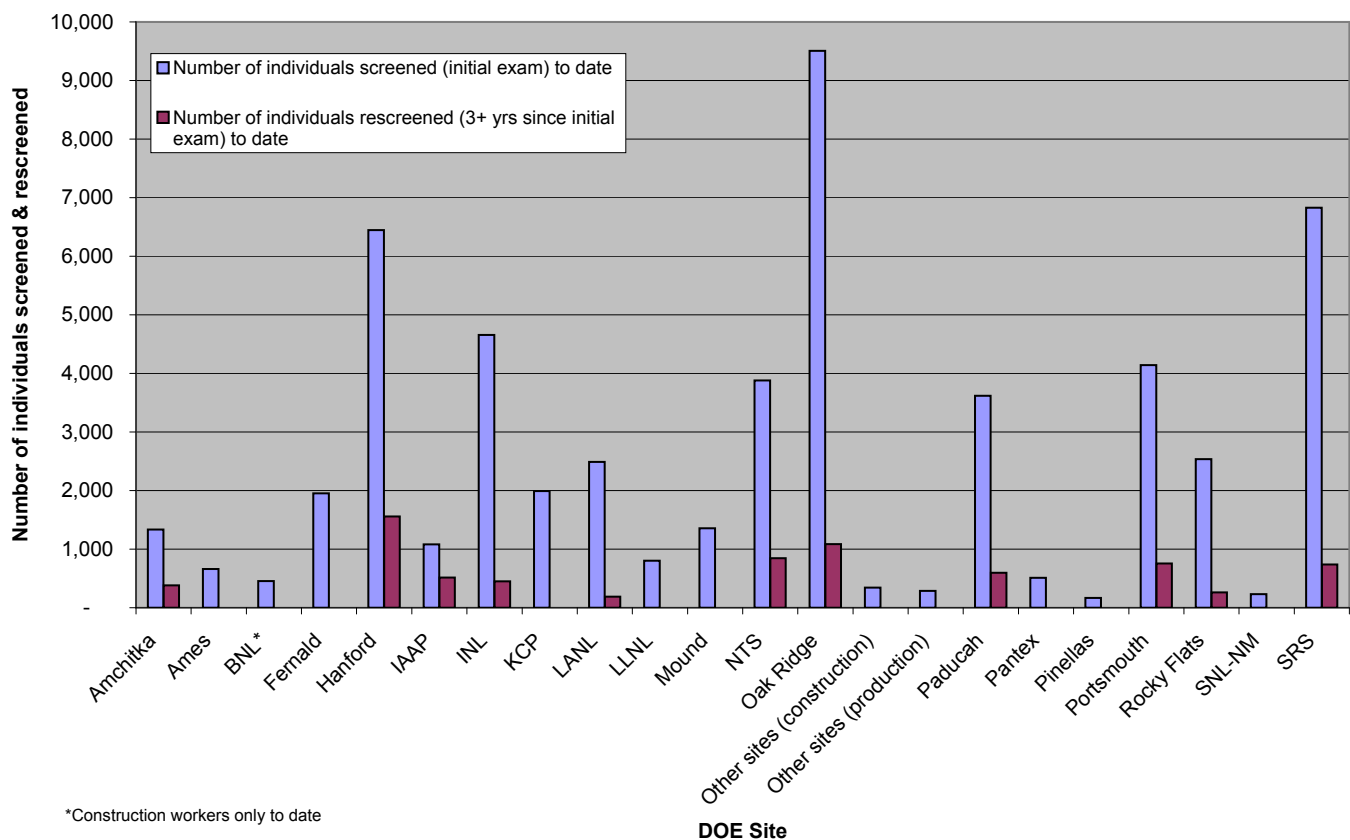


Figure 1. FWP Regional Projects

To establish an efficient nationwide medical screening program, DOE entered into cooperative agreements with universities, labor unions, and commercial organizations with expertise in administration of occupational medical programs. Over 360,000 potential FWP participants have been contacted as of December 2008. Table 5.1 (see Section 5) illustrates the number of former workers by site that the FWP service providers have attempted to contact.

2. Conduct appropriate medical screening of former workers who wish to participate in the program.

Site- and population-specific medical screening was initiated on a pilot basis at 12 sites in 1996-1997 and was gradually expanded to provide medical screening at all DOE sites. The DOE sites, sponsoring organizations, and the year that screening was initiated are provided in Table 5.2. As of December 2008, 55,285 individuals have undergone at least one medical screening examination (Table 5.3). In addition, 7,371 people have undergone re-screening three years after their initial screening and evaluation (Table 5.4). A breakdown of the number of individuals screened and re-screened by DOE site is presented in Figure 2.



BNL	Brookhaven National Laboratory	KCP	Kansas City Plant	NTS	Nevada Test Site
IAAP	Iowa Army Ammunition Plant	LANL	Los Alamos National Laboratory	SNL-NM	Sandia National Laboratories – New Mexico
INL	Idaho National Laboratory	LLNL	Lawrence Livermore National Laboratory	SRS	Savannah River Site

Figure 2. Number of Individuals Screened and Re-screened by DOE Site through December 31, 2008

Two important program developments occurred in 2005-2006 to address the special needs of sub-populations of DOE workers. Construction workers throughout the DOE complex are now served by a part of the FWP that is structured to meet the requirements of former workers who have had many different employers and highly intermittent job-related exposures due to the nature of work conducted by the building trades at DOE sites. These workers not only have those exposures typical of construction workers, but they are also exposed to additional hazardous substances within the production environment. Secondly, a supplemental program was created to find and offer medical screening to former workers who have retired to locations distant from their worksites and to workers whose site medical screening programs had been phased out or, in some cases, never established.

The results of the medical screening conducted thus far are as follows¹:

- Approximately 11,500 people, or 23.8 percent of those screened, had evidence of obstructive airways disease as indicated by spirometry (Table 5.3). Such findings typically indicate chronic obstructive airways disease (or emphysema) and/or asthma. While smoking is a prime cause of chronic obstructive airways

¹ Chest x-ray findings are not being reported at this time. The FWP is currently revising surveillance case definitions for associated pulmonary conditions to ensure that medical findings are being reported consistently across the program. Program data will be recalculated to reflect these new definitions. Results will be available on the FWP website by July 2009.

disease, occupational exposures to irritants at DOE sites also likely contributed to the development of this disorder in some cases.

- Hearing loss is extremely common among DOE former workers, with 59.4 percent, or 25,361 workers, meeting the definition of noise-induced hearing loss (Table 5.3). Given that the average age of the former worker population screened is 62, hearing impairment in a large percentage of these individuals is most likely a combination of age and noise exposure.
- Beryllium, a light metal that has been heavily used at DOE facilities, sometimes causes sensitization that may lead to chronic beryllium disease. Over 43,000 workers have participated in beryllium screening. Of these 1,318, or 3.1 percent, had at least one abnormal BeLPT. Table 5.5 illustrates beryllium testing findings.

In fiscal year (FY) 2000, Congress directed DOE to initiate a pilot program using computed tomography (CT) scanning for workers at the gaseous diffusion plants (K-25, Paducah, and Portsmouth) to allow early detection of lung cancer, a type of cancer for which existing treatments have limited effectiveness unless the cancer is detected at an early, curable stage. DOE was further directed in FY 2006 to begin a similar program at the Y-12 National Security Complex and the Oak Ridge National Laboratory (ORNL) and in FY 2008 to conduct such CT screening for workers at Mound, Fernald, and the gaseous diffusion plants. While some uncertainty remains about the benefits of CT scan screening to reduce lung cancer mortality, the Department provides this type of screening for participants who meet eligibility requirements, including a history of at-risk occupational exposures, in order to gather the data needed to make a final determination as to how this type of testing will be administered more broadly within the FWP.

Between 2000 and 2006, the FWP servicing the gaseous diffusion plants used state-of-the-art CT scanning to screen 6,220 former and current gaseous diffusion plant workers to detect small, early lung malignancies. Between 2006 and 2008, 2,335 former workers from Y-12 and ORNL were screened using CT scanning. The results of the CT scanning conducted thus far are as follows:

DOE Site	Number of Participants Screened	Number of Lung Cancers Detected	% Lung Cancers Detected at Early Stage
Paducah	1,737	8	88%
Portsmouth	2,047	18	78%
K-25	2,436	19	79%
ORNL	648	4	25%
Y-12	1,687	7	100%*
TOTAL	8,555	56	79%

**Final results have been obtained for 5 of the 7 lung cancers detected in Y-12 participants. One hundred percent of these lung cancer cases (5 of 5) were classified as early lung cancer. Information on the remaining two cases is expected shortly.*

An additional component of this pilot program is monitoring of mortality of the participants screened for early lung cancer detection at the gaseous diffusion plants in 2000-2006. This monitoring is performed through periodic receipt of vital status and cause-of-death information from the National Death Index.

Screening for personal health needs has also been very useful. While these exams do not add significant cost to the program, they have produced significant added benefits for participants. Data from the Building Trades National Medical Screening Program have shown that on the first exam 35 to 50 percent tested abnormal, but 44 to 57 percent of these participants who tested abnormal on the first exam were normal when they returned for a re-exam three years later. The results from the initial exam and the re-screening exam are as follows:

Condition	Abnormal on First Exam	Abnormal on First Exam and Normal on Second Exam
Blood sugar	38.8%	44.2%
Blood cholesterol	51.2%	53.4%
Blood pressure	35.7%	57.5%

3. Provide information and assistance to affected workers in gaining medical care and compensation for work-related illnesses.

The FWP requires that follow-up activities be conducted when medical screening tests indicate adverse medical findings. Individuals who are found to have adverse medical findings are referred to their personal physicians for follow-up care. They are also informed about the availability of EEOICPA benefits and are referred to DOL, which administers the EEOICPA program. Participants with abnormal beryllium blood test results are informed of the follow-up diagnostic testing that is funded through the EEOICPA upon acceptance of their claim.

4. Use the collected information to implement controls for current operations in order to prevent or reduce negative health effects for current and future employees.

As a result of the FWP, DOE has incorporated significant workplace hazard controls, and analysis methods have been enhanced in the areas of maintenance, construction, and decontamination and demolition operations. In addition, DOE has applied operational lessons learned to its current workforce based on exposures identified through the FWP.

As a result of the data gathered from screenings for chronic beryllium disease among current and former DOE Federal and contractor workers, DOE initiated the Chronic Beryllium Disease Prevention Program, codified in Title 10 C.F.R. Part 850, for its current workforce. This program requires DOE sites to inventory and assess beryllium exposure hazards to determine whether employees are at risk for chronic beryllium disease. Sites that identify employees at risk due to ongoing or past work must implement chronic beryllium disease prevention programs that include reporting health and exposure data to the DOE Beryllium-Associated Worker Registry. These sites are required to submit summary data in semi-annual progress reports. Health data are collected through medical surveillance programs for current workers at 21 DOE sites. Exposure data are collected through industrial hygiene programs at 16 sites that have continuing beryllium operations.

The findings from the Building Trades National Medical Screening Program have led to significant changes in DOE safety and health procedures during construction operations. In particular, the findings have led to a general awareness that beryllium exposures are a significant risk for construction workers. The Savannah River Site instituted a policy change requiring characterization of facilities for beryllium before construction operations start and providing construction workers with suitable protection. Also, due to the unexpectedly

large percentage of former construction workers from Brookhaven National Laboratory who have received abnormal beryllium tests, this program met with site leadership in September 2008 to inform them of the program's beryllium screening results and to discuss implications for integrated safety and health programs.

“ *The best medical exam I have ever had.* ”
- Participant, National Supplemental Screening Program

2.3 Overall Accomplishments

The program has resulted in a high level of satisfaction among participating former DOE workers. A rating of satisfactory was obtained in no less than 85 percent of customer satisfaction surveys received from FWP participants who had medical screenings over the past several years, as indicated by records maintained by HSS. In FY 2008, an average of 95.5 percent of the participants indicated satisfaction with the program. The vast majority of participants are very satisfied with the program in general, the services they receive, the quality of the personnel, and the timeliness of service delivery.

The program has been able to match national occupational medicine expertise with local parties throughout the DOE complex. To overcome both the longstanding shortage of occupational medicine expertise in DOE communities and the perceived lack of objectivity of local physicians expressed by some DOE workers, DOE has attracted renowned occupational medicine physicians from across the country to develop and conduct the FWP medical screening program using a network of over 10,000 clinics and prominent medical institutions with expertise in respiratory conditions. These physicians have worked with local clinical facilities and local labor unions to ensure highly accessible and appropriate medical screening services and follow-up.

The program has created good will among former DOE workers and local DOE communities. The implementation of the FWP has demonstrated good will and has in some cases softened the distrust of former workers who felt that DOE deceived them about the nature of the risks that they faced while working for the Department. The FWP has identified pre-cancerous conditions and cancers at early stages, allowing successful treatment and, in some cases, the elimination of the disease, thus substantially improving the health and well being of many former workers who participated in the program. With the knowledge that DOE is committed to worker safety and health, current workers will likely have fewer concerns about working at DOE sites, will remain with DOE longer than they would have otherwise, and will be more productive while employed. In addition, a valuable added benefit of the medical screenings provided through the FWP is the identification of non-occupational health conditions, such as uncontrolled high blood pressure, diabetes, and elevated cholesterol levels.

“ I received an urgent call from Queens College after my physical to follow up with a cardiologist who found 95% blockage in my main artery. The blockage required immediate surgery; I had stents inserted and I feel better today than I have in years. ”

- Participant, Worker Health Protection Program

3.0 Program Enhancements

Since the publication of the first FWP Annual Report in January 2008, a number of initiatives have been undertaken to improve upon past successes of this program.

- 1. Sharing quarterly progress reports with DOE Site Occupational Medicine Directors (SOMDs).** In an effort to open lines of communication between the former and current worker programs and to foster a better working relationship, DOE asked the FWP projects to share copies of their quarterly reports with each SOMD. In so doing, DOE not only informs the SOMDs of the medical findings, but also provides useful information for current workers' health and safety programs. In particular, this information is important for construction workers performing maintenance, remodeling, or cleanup in buildings contaminated with beryllium, asbestos, or other hazardous materials.
- 2. Requesting input from SOMDs concerning the data collected and reported on quarterly progress reports.** DOE recently participated in an Energy Facility Contractors Group (EFCOG) conference call, including SOMDs from across the complex, and requested recommendations for improving upon the information that is currently collected and reported.
- 3. Holding biannual program meetings.** Since its creation, HSS has held three biannual program meetings. Principal investigators, project coordinators, and other project staff have met in Washington, D.C. to share knowledge and ensure that the best methods for implementing outreach, notification, medical assessment, and follow-up processes are being used. Through these meetings, HSS has continued to make great strides toward improving this program, maintaining consistency across the programs, and evaluating new screening algorithms.
- 4. Forming a Task Group to explore program issues requiring focused attention.** At the second biannual meeting, a Task Group was created to review program issues, including:
 - a. Developing surveillance case definitions to ensure that medical findings are reported consistently across the program.
 - b. Revising Medical Screening/Re-screening Protocols to include additional tests on exam/re-exam. General health assessments have been added to the screening/re-screening protocol to further benefit former workers by identifying non-occupational conditions, such as high blood pressure, diabetes, and elevated cholesterol levels. These screenings add very little, and in some cases no, additional cost to the program.
 - c. Reviewing language relating to potential work-relatedness and possible compensability of medical findings based on "de-identified" letters reporting medical results (i.e., letters stripped of personally identifiable information) collected from each project.
- 5. Promoting participation by DOL and the National Institute for Occupational Safety and Health (NIOSH).** DOL and NIOSH met in November 2008 with DOE and FWP project staff to discuss how to link the FWP and EEOICPA efforts in order to better serve the former DOE worker population. Interfacing these two programs presents an opportunity for expanded success in outreach and program implementation of EEOICPA.
- 6. Informing current workers as they leave DOE employment that they are eligible for FWP benefits.** HSS is working to ensure that each DOE site has program information to share with workers as they retire/separate from DOE.

- 7. Obtaining updated rosters of former workers.** HSS is working with DOE program offices to obtain rosters of former workers from sites where screening has recently started, and updated rosters of workers who have retired or separated since previous rosters were obtained. The response from the program offices as a result of this request has been very positive, and we are receiving updated records to share with the FWPs.
- 8. Enhancing FWP planning, reporting, and budgeting processes:**
- a. HSS continues to meet with FWP project staff on a biannual basis to share and apply knowledge throughout the program and to plan future enhancements.
 - b. HSS recently revised the monthly financial report submitted by each project to ensure consistency in reporting and to enable DOE to better track project spending rates and plan for future budgetary needs.
 - c. Quarterly progress reports are being revised to separate medical findings from initial screening exams vs. re-screening exams, and to incorporate surveillance case definitions developed for multiple medical conditions to ensure consistency in reporting across the program.
- 9. Sharing knowledge and best practices.** Through the biannual program meetings, the group continues to share lessons learned and processes for improving program activities, such as outreach methods. In addition, a coordinated effort on the part of FWP project staff has resulted in cost-effective methods, such as sharing rosters and address-update services, to achieve program goals. This approach allows the projects to increase the number of medical screenings conducted within budget constraints.
- 10. Addressing preservation and ownership of DOE site records.** To deal with preservation and ownership of site and personnel records for DOE contractors and subcontractors, HSS is working with the DOE Office of the Chief Information Officer to ensure that this issue is addressed in all contracts. This provision will mitigate past concerns and will ensure continuity of records management. Acquiring rosters of former workers for the purpose of inviting them to participate in this program has, at times, been challenging. Clarifying ownership of these records will facilitate outreach to former workers in the future.

“ I wish to thank your screening program for possibly saving my life by participating in your free medical screening. The X-ray picked up a spot in my right lung. I was contacted by the doctor in Denver reading the X-rays. A PET scan found cancer in the upper lobe of my right lung. It was surgically removed in November and recovery was fast. ”

- Participant, Former Worker Medical Screening Program for the Iowa Army Ammunition Plant and Ames Laboratory

4.0 Future Initiatives

To continue making significant contributions and providing diagnostic health information to former workers and to ensure the Department continues to meet its obligation, DOE will conduct the following activities:

1. **Maintain the successes of the FWP.** Maintain the implementation of those elements that account for the program's high degree of success. For example:
 - a. HSS is committed to continuing to meet as a group twice a year to share and apply knowledge throughout the FWP to ensure that the best methods for implementing outreach, notification, medical assessment, and follow-up processes are being used.
 - b. HSS will continue to publish annual reports in order to communicate program findings to all stakeholders.
2. **Build on current successes.**
 - a. Continue to improve communication with participants and stakeholders.
 - i. DOE and the FWP will continue to work with DOL and NIOSH to: 1) discuss strategies for outreach, including sharing lessons learned, identifying joint outreach efforts to reach a larger audience (town hall meetings, joint mailings), and discussing how to better align communication strategies based on demographics of each population of workers; and 2) explore opportunities for the exchange of medical, site, and exposure information in order to provide assistance to the agencies tasked with EEOICPA claim adjudication.
 - ii. HSS will meet with and educate DOE and worker populations about the relationship between FWP and EEOICPA and how the programs can benefit workers.
 - iii. HSS will meet with EFCOG and site representatives to determine how data collected through this program can be translated into improved health and safety programs throughout the complex.
 - b. HSS will work with the DOE Office of Science Human Subjects Protection Program to create a DOE Central Institutional Review Board (IRB) in order to streamline the annual IRB process for reviewing FWP protocols, informational materials, and informed consents. Projects are reviewed to assure that they meet proper standards of human subject protection and that they accurately describe the benefits and risks of participating in the screening program, the process to be undertaken, and how their test results will be stored and protected. In most cases, each FWP project has been reviewed by its own organization's IRB, the DOE site IRB, and the DOE Central Beryllium IRB. DOE is working to restructure the current process to minimize duplication of efforts because FWP projects have received multiple reviews over the course of this program's existence. This process change would improve the efficiency of operations.
 - c. The FWP Task Group will continue to meet regularly to review issues requiring focused attention. A priority for this group in the coming year is to thoroughly review the de-identified letters containing medical results provided by each FWP project. This review will help determine what improvements could be made to better communicate the possibility that medical findings discovered during exams may be work-related, as well as the potential compensability of such findings.

- 3. Review the use of CT scanning.** An additional component of the CT scanning program is monitoring the mortality of the participants screened for early lung cancer detection at the gaseous diffusion plants in 2000-2006. This monitoring is performed through periodic receipt of vital status and cause-of-death information from the National Death Index. HSS will continue to review this information, as well as relevant publications, to determine how CT scanning should be administered in the FWP.

5.0 Tables

Tables 5.1 through 5.5 summarize the detailed results of FWP operations through December 2008.

In past years, sites reported the total number of contacts attempted and medical tests performed. This year, to provide a better measure of FWP activity, sites were asked to report the number of *individuals* to whom attempted contacts were directed or who were tested. Because of this change in reporting, the numbers reported here cannot be directly compared to those provided in previous annual reports.

Table 5.1 Number of Former Workers Contacted by DOE Site

Note: Numbers refer to individuals to whom attempted contacts were directed, rather than total number of attempted contacts.

Site	Former Workers Contacted
Amchitka Island Test Site	3,967
Ames Laboratory	3,966
Argonne National Laboratory	461
Brookhaven National Laboratory (Construction workers)	1,095
Fermi National Accelerator Laboratory	13
Fernald (Construction workers)	1,785
Fernald (Production workers)	51,290
Hanford Site (Construction workers)	5,016
Hanford Site (Production workers)	53,896
Idaho National Laboratory (Construction workers)	1,843
Idaho National Laboratory (Production workers)	42,135
Iowa Army Ammunition Plant	4,173
Kansas City Plant (Construction workers)	751
Kansas City Plant (Production workers)	1,903
Lawrence Berkeley National Laboratory	96
Lawrence Livermore National Laboratory	4,447
Los Alamos National Laboratory	25,506
Misc. small sites (Construction workers)	960
Misc. small sites (Production workers)	35
Mound (Construction workers)	571
Mound (Production workers)	15,284
Nevada Test Site	13,561
Oak Ridge Reservation ² (Construction workers)	5,332
Oak Ridge K-25 (Production workers)	27,759
Oak Ridge National Laboratory (Production workers)	5,657
Oak Ridge Y-12 (Production workers)	8,244
Paducah GDP (Construction workers)	1,139

² Includes Oak Ridge K-25, ORNL, and Y-12.

Table 5.1 Number of Former Workers Contacted by DOE Site (continued)

Site	Former Workers Contacted
Paducah GDP (Production workers)	6,511
Pantex Plant	4,221
Pinellas Plant (Production workers)	206
Portsmouth GDP (Construction workers)	1,279
Portsmouth GDP (Production workers)	13,635
Princeton Plasma Physics Laboratory	514
Rocky Flats (Construction workers)	1,110
Rocky Flats (Production workers)	15,315
Sandia National Laboratories, CA	332
Sandia National Laboratories, NM	2,238
Savannah River Site (Construction workers)	4,711
Savannah River Site (Production workers)	31,563
TOTAL	362,520

Table 5.2 Implementing Organizations

DOE Site ³	Location	Year Screening Initiated	Organization	Key Personnel
Amchitka Island Test Site	Alaska	2000	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Ames Laboratory	Iowa	2006	University of Iowa College of Public Health	Laurence Fuortes, MD, MS
Argonne National Laboratory	Illinois	2005	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD
Brookhaven National Laboratory (Construction workers)	New York	2006	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Brookhaven National Laboratory (Production workers)	New York	Will begin in 2009	Queens College of the City University of New York	Steven Markowitz, MD
Fermi National Accelerator Laboratory	Illinois	2005	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD

³ Sites listed are primary sites served, but multiple small sites are also served by CPWR - The Center for Construction Research and Training, through the Building Trades National Medical Screening Program, for construction workers and Oak Ridge Associated Universities, through the National Supplemental Screening Program, for production workers.

Table 5.2 Implementing Organizations (continued)

DOE Site ³	Location	Year Screening Initiated	Organization	Key Personnel
Fernald (Construction workers)	Ohio	2005	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Fernald (Production workers)	Ohio	2006	Queens College of the City University of New York and Atomic Trades & Labor Council	Steven Markowitz, MD Ray Beatty
Hanford Site (Construction workers)	Washington	1998	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Hanford Site (Production workers) ⁴	Washington	1998	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD
Idaho National Laboratory (Construction workers)	Idaho	2005	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Idaho National Laboratory (Production workers)	Idaho	2000	United Steel Workers, Queens College of the City University of New York, and Creative Pollution Solutions, Inc.	Jim Frederick Steven Markowitz, MD
Iowa Army Ammunition Plant	Iowa	2002	University of Iowa College of Public Health	Laurence Fuortes, MD, MS

⁴ This cohort transitioned from the University of Washington to Oak Ridge Associated Universities in 2007.

Table 5.2 Implementing Organizations (continued)

DOE Site ³	Location	Year Screening Initiated	Organization	Key Personnel
Kansas City Plant (Construction workers)	Missouri	2005	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Kansas City Plant (Production workers)	Missouri	2005	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD
Lawrence Berkeley National Laboratory	California	2008	Boston University School of Public Health and University of California, San Francisco	Lewis Pepper, MD, MPH Robert Harrison, MD, MPH
Lawrence Livermore National Laboratory	California	2007	Boston University School of Public Health and University of California, San Francisco	Lewis Pepper, MD, MPH Robert Harrison, MD, MPH
Los Alamos National Laboratory	New Mexico	2000	Johns Hopkins Bloomberg School of Public Health	Brian Schwartz, MD, MS Patrick Breyse, PhD, CIH
Mound (Construction workers)	Ohio	2005	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Mound (Production workers)	Ohio	2006	United Steel Workers, Queens College of the City University of New York, Creative Pollution Solutions, Inc.	Jim Frederick Steven Markowitz, MD

Table 5.2 Implementing Organizations (continued)

DOE Site ³	Location	Year Screening Initiated	Organization	Key Personnel
Nevada Test Site and Other Las Vegas Locations ⁵	Nevada	1997	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD
Oak Ridge K-25 (Production workers)	Tennessee	1996	United Steel Workers, Queens College of the City University of New York, Creative Pollution Solutions, Inc.	Jim Frederick Steven Markowitz, MD
Oak Ridge Reservation ⁶ (Construction workers)	Tennessee	1999	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Oak Ridge National Laboratory (Production workers)	Tennessee	2005	Queens College of the City University of New York and Atomic Trades & Labor Council	Steven Markowitz, MD Garry Whitley
Oak Ridge Y-12 (Production workers)	Tennessee	2005	Queens College of the City University of New York and Atomic Trades & Labor Council	Steven Markowitz, MD Garry Whitley
Paducah GDP (Construction workers)	Kentucky	2004	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Paducah GDP (Production workers)	Kentucky	1999	United Steel Workers and Queens College of the City University of New York	Jim Frederick Steven Markowitz, MD

⁵ This cohort transitioned from Boston University School of Public Health to Oak Ridge Associated Universities in 2007.

⁶ Includes Oak Ridge K-25, ORNL, and Y-12.

Table 5.2 Implementing Organizations (continued)

DOE Site ³	Location	Year Screening Initiated	Organization	Key Personnel
Pantex Plant	Texas	2005	Drexel University and The University of Texas Health Science Center at Tyler	Arthur Frank, MD, PhD
Pinellas Plant (Construction workers)	Florida	2005	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Pinellas Plant (Production workers)	Florida	2005	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD
Portsmouth GDP (Construction workers)	Ohio	2004	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Portsmouth GDP (Production workers)	Ohio	1999	United Steel Workers, Queens College of the City University of New York, Creative Pollution Solutions, Inc.	Jim Frederick Steven Markowitz, MD
Princeton Plasma Physics Laboratory	New Jersey	2005	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD

Table 5.2 Implementing Organizations (continued)

DOE Site ³	Location	Year Screening Initiated	Organization	Key Personnel
Rocky Flats (Construction workers)	Colorado	2006	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Rocky Flats (Production workers – beryllium and radiation) ⁷	Colorado	2005	Oak Ridge Associated Universities, Comprehensive Health Services, National Jewish Health, University of Colorado Health Sciences Center, and Occupational Health Link	Donna Cragle, PhD John McInerney, MD Lee Newman, MD
Sandia National Laboratories	California	2007	Boston University School of Public Health and University of California, San Francisco	Lewis Pepper, MD, MPH Robert Harrison, MD, MPH
Sandia National Laboratories	New Mexico	2006	Johns Hopkins Bloomberg School of Public Health	Maureen Cadorette, PhD Brian Schwartz, MD, MS
Savannah River Site (Construction workers)	South Carolina	1999	CPWR - The Center for Construction Research and Training, University of Cincinnati Medical Center, Duke University Medical Center, and Zenith Administrators	Knut Ringen, DrPH, MHA, MPH
Savannah River Site (Production workers)	South Carolina	1999	Medical University of South Carolina	David Hoel, PhD

⁷ This cohort transitioned from the University of Colorado Health Sciences Center to Oak Ridge Associated Universities in 2006.

Table 5.3 Selected Health Findings by DOE Site

Note: Numbers refer to individuals tested, rather than number of tests conducted.

DOE Site	Total Participants	Spirometry			Audiograms		
		Tested	Obstructive Airways Disease Detected ⁸		Tested	Hearing Loss Detected	
			(No.)	(%)		(No.)	(%)
Amchitka Island Test Site	1,334	1,035	187	18.1%	984	626	63.6%
Ames Laboratory	662	651	155	23.8%	N/A ⁹		
Brookhaven National Laboratory (Construction workers)	456	371	209	56.3%	354	189	53.4%
Fernald (Construction workers)	1,211	1,012	238	23.5%	992	389	39.2%
Fernald (Production workers)	742	706	105	14.9%	721	182	25.2%
Hanford Site (Construction workers)	2,683	2,102	599	28.5%	1,424	945	66.4%
Hanford Site (Production workers)	3,764	3,363	837	24.9%	2,732	1,327	48.6%
Idaho National Laboratory (Construction workers)	718	570	157	27.5%	512	288	56.3%
Idaho National Laboratory (Production workers)	3,940	3,846	732	19.0%	3,790	2,252	59.4%
Iowa Army Ammunition Plant	1,082	990	473	47.8%	N/A ¹⁰		
Kansas City Plant (Construction workers)	411	360	82	22.8%	329	167	50.8%
Kansas City Plant (Production workers)	1,579	1,538	336	21.8%	1,537	693	45.1%
Lawrence Livermore National Laboratory	804	772	194	25.1%	404	102	25.2%

⁸ Using CARET (1997) criteria; obstructive=FVC > 95% CI of predicted, and FEV1 /FVC < 95% CI of predicted. In addition, people with a mixed obstructive and restrictive pattern (FVC < 95% CI of predicted, and FEV1 /FVC < 95% CI of predicted) are included.

⁹ This project does not provide audiograms.

¹⁰ This project does not provide audiograms.

Table 5.3 Selected Health Findings by DOE Site (continued)

DOE Site	Total Participants	Spirometry			Audiograms		
		Tested	Obstructive Airways Disease Detected ⁸		Tested	Hearing Loss Detected	
			(No.)	(%)		(No.)	(%)
Los Alamos National Laboratory	2,488	1,586 ¹¹	98	6.2%	2,212	1,269	57.4%
Mound (Construction workers)	280	240	61	25.4%	224	121	54.0%
Mound (Production workers)	1,077	1,010	239	23.7%	1,035	465	44.9%
Nevada Test Site and Other Las Vegas Locations	3,881	3,881	1,433	36.9%	3,490	2,848	81.6%
Oak Ridge K-25 (Production workers)	4,234	4,118	873	21.2%	3,825	2,595	67.8%
Oak Ridge National Laboratory (Production workers)	948	922	200	21.7%	896	529	59.0%
Oak Ridge Reservation (Construction workers) ¹²	2,225	1,815	451	24.8%	1,667	1,132	67.9%
Oak Ridge Y-12 (Production workers)	2,100	2,013	484	24.0%	1,974	1,191	60.3%
Other sites (Construction workers) ¹³	342	316	75	23.7%	289	158	54.7%
Other sites (Production workers) ¹⁴	286	272	80	29.4%	222	104	46.8%
Paducah GDP (Construction workers)	716	640	195	30.5%	588	430	73.1%
Paducah GDP (Production workers)	2,903	2,833	474	16.7%	2,888	1,916	66.3%

¹¹ This project does not use the CARET criteria at this time. The numbers include former workers with a FEV1/FVC < 70% of predicted based on Knudson Prediction Equations.

¹² Includes Oak Ridge K-25, ORNL, and Y-12. Findings are not broken out by specific Oak Ridge facility for the construction project.

¹³ Sites where the number of individuals screened to date is less than 100. Includes Argonne West, Battelle Laboratories King Avenue and West Jefferson, Brush Luckey, General Electric Evendale, Huntington Pilot Plant, Mallinckrodt, Pinellas, Piqua, Weldon Spring, and Yucca Mountain.

¹⁴ Sites where the number of individuals screened to date is less than 100. Includes Albany Research Center, Argonne, Battelle Laboratories King Avenue, Bendix Aviation-Pioneer Division, Brookhaven NL, Energy Technology Engineering Center, Fermi, General Electric Company, General Electric Plant, Grand Junction Operations Office, Lawrence Berkeley NL, Princeton Plasma Physics, Rocky Flats, and Sandia NL-CA.

Table 5.3 Selected Health Findings by DOE Site (continued)

DOE Site	Total Participants	Spirometry			Audiograms		
		Tested	Obstructive Airways Disease Detected ⁸		Tested	Hearing Loss Detected	
			(No.)	(%)		(No.)	(%)
Pantex Plant	512	500	121	24.2%	N/A ¹⁵		
Pinellas Plant (Production workers)	166	160	48	30.0%	161	50	31.1%
Portsmouth GDP (Construction workers)	837	676	166	24.6%	658	444	67.5%
Portsmouth GDP (Production workers)	3,305	3,270	706	21.6%	3,299	1,913	58.0%
Rocky Flats (Construction workers)	444	374	131	35.0%	351	207	59.0%
Rocky Flats (Production workers)	2,092	2,061	659	32.0%	740	338	45.7%
Sandia National Laboratories (NM only)	233	221 ¹⁶	20	9.0%	198	107	54.0%
Savannah River Site (Construction workers)	3,225	2,804	573	20.4%	2,775	1,337	48.2%
Savannah River Site (Production workers)	3,605	1,355	148	10.9%	1,398	1,047	74.9%
TOTAL	55,285	48,383	11,539	23.8%	42,669	25,361	59.4%

¹⁵ This project does not provide audiograms.

¹⁶ This project does not use the CARET criteria at this time. The numbers include former workers with a FEV1/FVC < 70% of predicted based on Knudson Prediction Equations.

Table 5.4 Number of Former Workers Re-screened by DOE Site

Note: Numbers refer to individuals re-tested three years after their initial screening, rather than number of tests conducted.

Site	Former Workers Re-screened
Amchitka Island Test Site	380
Hanford Site (Construction workers)	615
Hanford Site (Production workers)	942
Idaho National Laboratory (Production workers)	449
Iowa Army Ammunition Plant	517
Los Alamos National Laboratory	187
Nevada Test Site	847
Oak Ridge Reservation ¹⁷ (Construction workers)	665
Oak Ridge K-25 (Production workers)	421
Paducah GDP (Construction workers)	147
Paducah GDP (Production workers)	448
Portsmouth GDP (Construction workers)	135
Portsmouth GDP (Production workers)	620
Rocky Flats (Production workers)	260
Savannah River Site (Construction workers)	718
Savannah River Site (Production workers)	20
TOTAL	7,371

¹⁷ Includes Oak Ridge K-25, ORNL, and Y-12.

Table 5.5 Results of Beryllium Lymphocyte Proliferation Tests by DOE Site (through December 2008)

DOE Site	Number of Participants Tested	Participants with Abnormal Test (No. (%))
Ames Laboratory	654	29 (4.4%)
Brookhaven National Laboratory (Construction workers)	372	25 (6.7%)
Fernald (Construction workers)	1,034	15 (1.5%)
Fernald (Production workers)	562	9 (1.6%)
Hanford Site (Construction workers)	2,095	58 (2.8%)
Hanford Site (Production workers)	2,950	108 (3.7%)
Idaho National Laboratory (Construction workers)	590	16 (2.7%)
Idaho National Laboratory (Production workers)	3,601	86 (2.4%)
Iowa Army Ammunition Plant	1,062	38 (3.6%)
Kansas City Plant (Construction workers)	365	13 (3.6%)
Kansas City Plant (Production workers)	1,468	56 (3.8%)
Lawrence Livermore National Laboratory	445	21 (4.7%)
Los Alamos National Laboratory	2,512	65 (2.6%)
Mound (Construction workers)	244	2 (0.8%)
Mound (Production workers)	996	34 (3.4%)
Nevada Test Site and Other Las Vegas Locations	2,106	49 (2.3%)
Oak Ridge K-25 (Production workers)	4,116	211 (5.1%)
Oak Ridge National Laboratory (Production workers)	900	35 (3.9%)
Oak Ridge Reservation (Construction workers) ¹⁸	2,044	41 (2.0%)
Oak Ridge Y-12 (Production workers)	2,015	101 (5.0%)
Other sites (Construction workers) ¹⁹	411	6 (1.5%)
Other sites (Production workers) ²⁰	185	8 (4.3%)
Paducah GDP (Construction workers)	656	23 (3.5%)
Paducah GDP (Production workers)	2,396	73 (3.0%)
Pantex Plant	481	8 (1.7%)
Pinellas Plant (Production workers)	153	9 (5.9%)
Portsmouth GDP (Construction workers)	696	15 (2.2%)
Portsmouth GDP (Production workers)	2,865	42 (1.5%)
Rocky Flats (Construction workers)	408	6 (1.5%)
Rocky Flats (Production workers)	739	19 (2.6%)
Sandia National Laboratories, NM	218	8 (3.7%)

¹⁸ Includes Oak Ridge K-25, ORNL, and Y-12. Findings are not broken out by specific Oak Ridge facility for the construction project.

¹⁹ Sites where the number of individuals screened to date is less than 100.

²⁰ Sites where the number of individuals screened to date is less than 100.

Table 5.5 Results of Beryllium Lymphocyte Proliferation Tests by DOE Site (continued)

DOE Site	Number of Participants Tested	Participants with Abnormal Test (No. (%))
Savannah River Site (Construction workers)	2,795	53 (1.9%)
Savannah River Site (Production workers)	991	36 (3.6%)
TOTAL	43,125	1,318 (3.1%)

Appendix A: Individual Project Descriptions

The U.S. Department of Energy (DOE) Former Worker Program (FWP) projects are briefly described below.

The Medical Screening Program for Former Workers of Lawrence Livermore, Lawrence Berkeley, and Sandia National Laboratories

The Medical Screening Program for Former Workers of Lawrence Livermore, Lawrence Berkeley, and Sandia National Laboratories in northern California is conducted by the Boston University School of Public Health and the University of California, San Francisco. Screenings for former workers from Lawrence Livermore began in April 2007 and from Sandia in autumn 2007. The program expects to begin screening former workers from Lawrence Berkeley in early 2009. The hazards addressed by the program include asbestos, beryllium, lasers, laser dyes, lead, noise, radiation, silica, and solvents. Through December 2008, a total of 864 individuals from these sites have been screened. Results indicate 111 (12.8 percent) with hearing loss and 59 (6.8 percent) with suspicious lung nodules, nodes, or lesions. In addition, about 55 percent of those screened (481) were tested for beryllium sensitivity. Twenty-three (4.8 percent) have had an abnormal test and sixteen (3.3 percent) are confirmed to be sensitized to beryllium. Ninety-eight percent of those screened have been “mostly” or “completely” satisfied with their screening experience and the professionalism of the project staff. Over the next year, the project expects to send out approximately 6,000 notifications to additional former workers from all three laboratories. The project also hopes to reach potential participants through enhanced collaboration with the national laboratories, as well as labor and community organizations.

The Building Trades National Medical Screening Program

The Building Trades National Medical Screening Program (BTMed), which is administered by CPWR - The Center for Construction Research and Training, an applied occupational health research and development center of the Building and Construction Trades Department of the AFL-CIO, serves former construction workers from 23 DOE sites. The mission of the BTMed is to identify construction workers who have been employed on DOE sites and who may be at significant risk for occupational illnesses as a result of this work. BTMed provides these workers with the best possible services, including a work history interview and a medical screening exam. BTMed relies on a clinic network of over 200 providers to conduct the exam. In fiscal year (FY) 2008, BTMed completed its program goal of 2,412 screenings, and since its inception has completed more than 18,000 screenings. The overall satisfaction rate continues to improve and reached 98 percent in FY 2008.

A network of BTMed outreach offices near DOE sites work with local stakeholders to promote the screening program and the benefits of participation. CPWR’s close ties to the unions that represent construction workers have been particularly effective in facilitating outreach. Every worker receives a written summary of all medical results within three to six weeks, and a program nurse is available to answer any questions.

BTMed continues to operate a geographically targeted outreach component, including direct mail through union and site rosters, advertisement placement, and public service announcements. BTMed has an enhanced web-based electronic system that enables workers to register, complete intake procedures, and self-administer the work history on-line (www.btmed.org). It also maintains an electronic medical record that the worker can access at his/her convenience.

Pantex Former Worker Medical Screening Program

The Pantex Former Worker Medical Screening Program (PFWP) is conducted by the Drexel University School of Public Health and a team of occupational health professionals from the University of Texas Health Science Center at Tyler who have a longstanding relationship with the Amarillo community through previous public health projects.

Exams are provided at the West Texas A & M Health Partners Clinic, located in Amarillo. The PFWP enjoys an open and collegial relationship with the DOE site, especially the medical department. However, recruitment efforts had been hampered by the lack of access to information identifying Pantex workers who severed employment during the Mason-Hanger management period some years ago. With the assistance of the DOE Office of Health, Safety and Security, the Pantex employee list retained by Oak Ridge Associated Universities during the conduct of beryllium monitoring was provided to the PFWP. A confidential, protected search for current addresses yielded an unduplicated list of over 3,000 individuals who can now be invited to participate.

The Pantex facility performs high security-level work; employees were indoctrinated with the need to maintain complete confidentiality about the nature of their work. This concern about divulging work history and exposures has deterred participation. A group of eight former workers who participated in this program, and who maintain some level of communication with other former workers, has been recruited as helpers for the program called “Ambassadors.” In a volunteer capacity, they have made personal phone calls to previously unresponsive former workers, resulting in over 25 screenings in the last quarter.

The PFWP continues to enjoy exceptionally positive ratings. One hundred percent of satisfaction surveys returned this year were favorable, and an average of 99.1 percent have been favorable since the inception of the program.

Medical Exam Program for Los Alamos National Laboratory and Sandia National Laboratories, NM, Former Workers

The Medical Exam Program for Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL-NM) Former Workers is managed by the Johns Hopkins Bloomberg School of Public Health (JHBSPH) and co-investigators, the University of New Mexico (UNM). The program offers free medical exams to all former workers from both sites in New Mexico who had possible exposures to asbestos, beryllium, lead, noise, radiation, solvents, and silica (SNL-NM only). The LANL FWP also offers re-examinations to those who had past exposure to asbestos and/or beryllium. To date, the LANL program has completed 2,700 exams (initial and re-screens), and over 200 have been completed at SNL-NM. This program is one of several unique programs within the FWP. Most examinations are performed by physicians and health care providers from JHBSPH, UNM, or the LANL Occupational Medicine Clinic. Each participant provides a detailed exposure and medical history prior to examination, through an interview conducted by former workers from LANL and Sandia National Laboratories. The local program office in Española, NM, is staffed by a former LANL worker. During examination sessions, former workers schedule time to meet with the program physicians to discuss their examination results and to ask questions. The program works to assist former workers with workers’ compensation claims and has written numerous letters in support of claims for Federal compensation. Over the past year, the program has reached out to former workers through retiree meetings and mailings and has placed advertisements in the local newspapers. Next year, the program plans to meet with union organizations to discuss the program and work with unions to increase participation.

For those former workers who are uninsured, the free medical exam and testing offered through the program is frequently the only medical care that these individuals have had in many years. On exit surveys, over 95 percent of program participants stated that they were satisfied with all components of the program.

Savannah River Site Former Production Worker Medical Screening Program

The primary goal of the Savannah River Site (SRS) former production worker health screening program is to provide medical evaluations to former SRS workers who are at significant risk for health problems because of potential exposure to hazardous materials during their employment at the SRS and to develop a clear understanding of the health of the former SRS worker population compared to other industrial worker populations. The program’s secondary goals are to provide information and education to former workers concerning their current health status and to serve as a resource for referral to effective medical care or workers’ compensation for any work-related illness that might be detected. Well over 3,000 former workers have been screened, and a number of effects have been identified. These are primarily hearing loss and obstructive pulmonary disease, with some cases of chronic beryllium disease. The program has also identified some non-work related health issues. The program continues

to contact former workers using databases provided by the site, and a few workers have requested re-exams many years after the initial examination. The program has had a good response from the workers even when they did not want to have a physical examination. The satisfaction survey data shows how effective the program is in the minds of the participating former workers.

National Supplemental Screening Program

In compliance with Public Law 102-484, Section 3162 (1993), the National Supplemental Screening Program (NSSP) was established to evaluate the health of former DOE employees who may have been exposed to hazardous substances. Since October 2005, the NSSP, which is managed by Oak Ridge Associated Universities and a team from National Jewish Health, the University of Colorado Health Sciences Center, Comprehensive Health Services, and Occupational Health Link, has provided web-enabled, secure, standardized medical screening examinations for geographically-dispersed former DOE employees. Using business- and clinical-decision logic, the program collects over 1,200 data points per participant through medical clinics nationwide. The NSSP has provided nearly 5,000 initial medical screening examinations for former DOE employees in all 50 states, Puerto Rico, and Canada. Key successes of the NSSP include: (1) providing the first DOE web-enabled secure nationwide medical examination and records system; (2) mailing results letters on average in less than seven weeks from the date of the examination; (3) developing the ability to accept and promptly complete medical examination referrals from other DOE FWP's; and (4) implementing a medical team approach that provides consistent medical results reviews and letters, regardless of where the examination was performed. So far, the NSSP has not had to rely on outreach to maintain a constant influx of participants seeking medical examinations. However, in FY 2009, the NSSP plans to commence a geographically-targeted NSSP notification process using direct mailings and telephone calls. The NSSP has maintained an outstanding participant satisfaction rating (99.2 percent satisfaction approval), based on 1,613 returned surveys (32.9 percent response rate).

Worker Health Protection Program

The Worker Health Protection Program (WHPP) provides screening at eight DOE sites nationwide. WHPP is led by Queens College, City University of New York along with the United Steelworkers, the Atomic Trades and Labor Council, the former Fernald Atomic Trades and Labor Council, and Creative Pollution Solutions. The goals are to provide medical screening to inform former workers about possible work-related illnesses and to detect illnesses at an early stage when medical intervention may be helpful. For many former and some current workers²¹, WHPP provides, for the first time, the opportunity to obtain an occupational medicine physician's independent assessment of their health in relation to prior workplace exposures.

The success of this program is in large part due to involvement of local site coordinators, who are current and/or former workers who make up the "Ground Teams." The local coordinators provide information and assistance to new and prospective participants regarding all aspects of the program, including Energy Employees Occupational Illness Compensation Program Act claims. The Ground Teams are the local face of the program and, as such, inspire trust and credibility among participants. Because of their involvement, word of mouth is the single most successful outreach method of WHPP. Program coordinators will continue to work with the Ground Teams to develop outreach plans that best meet their specific needs, such as newspaper articles, Internal Revenue Service mailings, and billboards. The program will work closely with DOE to obtain rosters of workers, which will be used for invitation letters and brochure mailings.

An anonymous satisfaction survey is used to elicit information on the quality of service that is provided. The feedback is reviewed to identify which aspects of the program are functioning well and which need improvement. Satisfaction survey results for 2008 indicated an overall program approval rating of 94 percent.

²¹ Medical screening is available to current workers only at the three gaseous diffusion plants (K-25, Paducah, and Portsmouth).

Worker Health Protection Program – Early Lung Cancer Detection Program

As part of the DOE-supported WHPP, Queens College, in association with the Atomic Trades and Labor Council of Oak Ridge, conducts an Early Lung Cancer Detection Program for former and current workers at Y-12 and Oak Ridge National Laboratory (ORNL). The program applies low-dose computed tomography (CT) scanning by means of a dedicated CT scanner under an international consensus protocol to screen Y-12 and ORNL workers at excess risk of lung cancer, according to program eligibility criteria. The program is patterned after a similar CT scan program sponsored by Queens College and the United Steelworkers for workers at the gaseous diffusion plants at Paducah, Portsmouth, and K-25 between 2000 and 2006. The Y-12 and ORNL program was initiated in August 2006 at the direction of Congress and is undertaken under the supervision of the Oak Ridge and Queens College Institutional Review Boards. This program is a major participant in the International Early Lung Cancer Action Program, a consortium of 33 screening centers in 8 countries.

Program successes to date include:

- CT screened 2,335 Y-12 and ORNL workers (8/06-12/08)
- Identified 11 lung cancers to date, including 8 at an early stage
- Identified an additional 4 kidney cancers and 3 thyroid cancers
- Re-screened 1,490 workers 1 year after their initial low-dose CT scan
- Achieved very high rates of satisfaction and compliance with protocol.

Former Worker Medical Screening Program for the Iowa Army Ammunition Plant and Ames Laboratory

The Former Worker Medical Screening Program for the Iowa Army Ammunition Plant (IAAP) and Ames Laboratory is conducted by the University of Iowa College of Public Health. The program has located and screened more than 1,700 former nuclear weapons workers in Iowa, some of whom worked over half a century ago in research and manufacturing of atomic weaponry. Over 12,000 employees worked at or in the vicinity of the Ames Laboratory. Of these, 8,893 are living and their addresses are known; 77 percent live outside of Iowa and are referred to the NSSP. Screening results from the 662 Ames participants have detected three lung cancers and one cancer of the lymphatic system. Approximately 3,000 to 5,000 employees worked on or in the vicinity of Line 1 at the IAAP. Screening results from the 1,082 IAAP participants have detected 11 lung cancers, 4 prostate cancers, 2 mesotheliomas, 1 thyroid cancer, 1 colon cancer, and 1 chronic lymphocytic leukemia. Of the 782 satisfaction surveys returned, 98 percent of former workers have been satisfied with their medical screening.

This program has also educated and assisted individual workers, surviving family members, and community members regarding historical exposures and health risks at these sites and the Energy Employees Occupational Illness Compensation Program. The University of Iowa has helped an estimated 1,500 former workers or their families with medical information and assistance in filing for compensation. The program has provided Federal government agencies with verification of employment for an estimated 1,500 former IAAP workers. This program has been recognized by former workers, local communities, and health care providers as a resource center for information on adverse health effects of work in the nuclear weapons industry.

Outreach to date has included direct mailings, recruitment calls, town hall meetings, radio interviews, press releases, articles in local newspaper, and the distribution of informational brochures.

Abbreviations Used in This Report

AFL-CIO	<i>American Federation of Labor and Congress of Industrial Organizations</i>
BeLPT	<i>Beryllium Lymphocyte Proliferation Test</i>
BTMed	<i>Building Trades National Medical Screening Program</i>
C.F.R.	<i>Code of Federal Regulations</i>
CPWR	<i>CPWR – The Center for Construction Research and Training</i>
CT	<i>Computed Tomography</i>
DOE	<i>U.S. Department of Energy</i>
DOL	<i>Department of Labor</i>
EEOICPA	<i>Energy Employees Occupational Illness Compensation Program Act</i>
EFCOG	<i>Energy Facility Contractors Group</i>
FWP	<i>Former Worker Program</i>
FY	<i>Fiscal Year</i>
GDP	<i>Gaseous Diffusion Plant</i>
HSS	<i>DOE Office of Health, Safety and Security</i>
IAAP	<i>Iowa Army Ammunition Plant</i>
IRB	<i>Institutional Review Board</i>
JHBSPH	<i>Johns Hopkins Bloomberg School of Public Health</i>
K-25	<i>Oak Ridge K-25 Gaseous Diffusion Plant</i>
LANL	<i>Los Alamos National Laboratory</i>
NIOSH	<i>National Institute for Occupational Safety and Health</i>
NSSP	<i>National Supplemental Screening Program</i>
ORNL	<i>Oak Ridge National Laboratory</i>
PFWP	<i>Pantex Former Worker Medical Screening Program</i>
SNL-NM	<i>Sandia National Laboratories – New Mexico</i>
SOMD	<i>Site Occupational Medicine Director</i>
SRS	<i>Savannah River Site</i>
UNM	<i>University of New Mexico</i>
WHPP	<i>Worker Health Protection Program</i>
Y-12	<i>Y-12 National Security Complex</i>

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