Hanford Joint Council for Resolving Employee Concerns

Report Regarding Programs for Beryllium-Exposed Workers

March 26, 2002

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Acronyms

BAG	Beryllium Awareness Group
BeHAs	Beryllium Health Advocates
BT	Barriers to Being Tested
CBD	Chronic Beryllium Disease
CBDPPs	Chronic Beryllium Disease Prevention Programs
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980 (federal Superfund law)
CMT	Case Management Team
CRESP	Consortium of Risk Evaluation with Stakeholder Participation, University of Washington School of Public Health and Community Medicine
D&D	Decontamination and Decommissioning
DOE	U. S. Department of Energy
DOE-EH	U. S. Department of Energy, Environment, Safety, and Health Program
DOE-HQ	U. S. Department of Energy, Headquarters
DOE-RL	U. S. Department of Energy, Richland Office
DoL	Department of Labor
EEOICP	Energy Employees Occupational Illness Compensation Program
Group	Beryllium Awareness Group
HEHF	Hanford Environmental Health Foundation
IARC	International Agency for Research on Cancer
IHs	Industrial Hygiene personnel
L&I	Washington State Workers' Compensation Program (Labor & Industry)
LPT	Lymphocyte Proliferation Test
MDL	Minimum Detection Limit
MI	Medical Issues
MS	Medical Surveillance Program
MSDS	Material Safety Data Sheet
NJMC	National Jewish Medical Research Center
PAE	Preventing Additional Exposures to Beryllium
PC	Protecting Confidentiality
PI	Plant Injury
SOMD	Site Occupational Medical Director
UW	University of Washington Medical Center
WI	Workers' Introduction to the CBDPP

Action Level for airborne beryllium (10 CFR 850.23): $0.2\mu g/m^3$ (micrograms per cubic meter).

Surface Contamination Limit for Equipment and Items removed from regulated area (10 CFR 850.31): $0.2\mu g/100cm^2$ (micrograms per one hundred square centimeters).

Beryllium-affected workers are those diagnosed as sensitized to beryllium or those with CBD.

Beryllium-associated workers are any workers whose work potentially exposes them to airborne concentrations of beryllium above the action level; and, sensitized workers or workers with CBD. See 10 CFR 850.3

Executive Summary

The Hanford Joint Council for Resolving Employee Concerns, chartered to resolve issues related to health and safety at the Hanford site, prepared this report regarding programs for beryllium-exposed workers. When two beryllium-affected workers brought issues regarding various beryllium programs to the Council and expressed frustration with their lack of success in dealing with them, either as individuals or as members of the Beryllium Awareness Group (BAG or the Group), the Council agreed to review the issues. A three-member Council subcommittee began its review and enlisted the assistance of Dr. Marc Schenker, MD MPH, chair of the Department of Epidemiology and Preventive Medicine at the University of California at Davis, as a consultant on medical issues. The Council wishes to commend Fluor Hanford, the prime contractor on site, not only for its willingness to agree to the Council's undertaking to resolve the concerns of the individual workers, but also for its cooperation in this broader study of programs for beryllium-exposed workers. The goal of this report is to improve conditions for all beryllium-affected workers and to help ensure they have a safe work environment.

The subcommittee conducted more than 200 hours of interviews with workers and with individuals in management at contractors and at the U. S. Department of Energy, Richland (DOE-RL), as well as at the Hanford Environmental Health Foundation (HEHF) to collect information, to identify issues, to understand the context, and to find possible solutions. The Council has endeavored to perform a systematic assessment of the programs and to discover opportunities for meaningful and effective change by reviewing the requirements of the Department of Energy's 10 CFR 850 Rule on Chronic Beryllium Disease Prevention Programs (CBDPPs), and the expectations of the workers, and comparing them to the status of the site CBDPP as of September 2001.

Changes to the programs have been made since that date, some of them directly responsive to matters raised in this report. For example, Fluor Hanford senior management made valuable improvements to the policy regarding implementation of work restrictions for beryllium-affected workers in February 2002. The Council commends that reform as well as others that have provided greater protections and better access to services for the workers. In other instances, the changes have not accomplished the outcomes or met the standards identified in this report. In addition, some changes have occurred that did not come to the attention of the Council, and those should now be measured against these recommendations. The Council hopes that this report will suggest approaches that will be found helpful.

Some issues arise from perceived inadequacies in the implementation of 10 CFR 850 issued in December 1999 (effective January 2000) in reaction to learning about the impact of exposure to beryllium on workers at U. S. Department of Energy (DOE) sites. (Implementation of the Rule is driven by the site-wide CBDPP and the implementing procedures of individual contractors.) Other issues arise from related problems that are not specifically addressed in 10 CFR 850 but, nevertheless, affect the workers' access to medical surveillance and the site's efforts to minimize exposure to beryllium, both of which are provided for in the Rule.

In addition, the Council learned of issues that workers encounter due to various agencies, institutions, and programs not yet being aware of and sensitive to the needs of beryllium-affected workers, or having conflicting standards for medical programs and compensation.

Since it is a relatively new program and has had to grow beyond the original expectations, anomalies and weaknesses have developed. This review is timely in that it helps focus on the work that has been done by many dedicated individuals in establishing the program and it helps identify some of the problem areas.

In many instances, the Council found that, although policies and procedures are in place to address the requirements set forth in 10 CFR 850, lack of effective implementation and communication creates problems and misunderstandings. Paper audits generally show that implementing procedures are in conformance with the Rule. However, in many instances that the Council learned of, practice appears not to be. Even where, in efforts to address health and safety concerns, policies and procedures have been written that go beyond the requirements of the Rule, practice, unfortunately, has not caught up.

The Council's recommendations arise directly from these problems and misunderstandings. The Council believes that effective processes and focused resources, as well as open and meaningful dialogue with the workers, would contribute to bringing practice into alignment with policies and procedures – where it counts and in ways that will make a difference for the workers.

Recommendations such as those for a patient health advocate, working with other medical personnel on a case management team; for an ombudsman to assist the workers and to have responsibility and authority to oversee the programs for DOE-RL; for comprehensive reviews with the affected workers of the procedures for medical removal, medical removal protection benefits, and multiple physician review; for site-wide standards for monitoring and reporting the potential for exposures and restricting access appropriately, along with training for workers and supervisors; for development of a risk communication program using all epidemiological and exposure data and outside expert assistance; and for making the programs and procedures transparent and accessible to workers; these are a few of the changes recommended by the Council as ways to make a difference.

The report sets forth information regarding the issues that were brought to the Council's attention through its interviews and by its review of documents. The Council wishes to acknowledge the cooperation of numerous workers, management officials, and medical personnel who agreed to be interviewed and to provide information in the course of the assessment. The Council wishes specifically to commend the workers who brought the concerns to the Council. They were and continue to be interested in effecting changes to the systems rather than in addressing only their own issues. Their continuing commitment to collecting information and bringing it to the attention of the Council has contributed significantly to the scope of this report and to the wealth of information the Council reviewed.

The Council seeks not to establish blame nor to challenge individual perception, but to identify problems that cause concern and to suggest why and how the concerns should be resolved. The Council normally issues binding recommendations regarding individual employee concerns that are issued to the contractor and employee. This report is a policy report with recommendations for various levels of DOE, contractors, and employees. As such, this report, unlike Council recommendations for resolving concerns affecting specific individuals, is not binding.

The Council is not a regulatory body. Pursuant to its prevention mission, it undertook this study to evaluate the site's beryllium programs, their components, and the institutions involved in the programs. The Council is composed of individuals knowledgeable about the site and about worker health and safety. This assessment has been undertaken with the goal of identifying desirable outcomes. The items in the report are commended to the attention of those with responsibility for the programs and their components with the expectation that the recommendations will help achieve outcomes that will contribute to the health and safety of Hanford's workers.

While the Council has done careful research within the bounds of its expertise and resources, it is left to those with contract, regulatory, and other oversight responsibilities to make any determinations of action. This report is offered in a spirit of constructively seeking to address the apparent anomalies and gaps in the programs.

In the Council's view, all of the concerns set forth warrant investigation, and some of the issues should be considered urgent, such as those that move toward full compliance with 10 CFR 850. The Council believes, too, that the included recommendations deserve thoughtful consideration; yet recognizes that as more is learned about the issues, solutions other than those suggested in the report may be found to be more effective and practicable.

The Council's report is based on our joint perspectives as informed by our research and interviews, including feedback on the feasibility of our recommendations. The Council recognizes that perceptions are shaped by many factors: past experiences; position, authority, and responsibility; emotional commitment; health and physical condition now and anticipated in the future; and a myriad of others. The perceptions of the individuals on the subcommittee are not the same as each other's; nor the same as contractor management's; nor affected workers'; nor DOE-RL's; nor HEHF's; nor the BAG's. However, the perceptions of all these parties, as well as others not listed, are valuable in this context and deserve respectful consideration as the parties seek together to resolve these concerns and others they identify. Hanford's workers are a valuable resource as well as the customers in these efforts.

Affected workers, those diagnosed as sensitized to beryllium or those with chronic beryllium disease, meet twice a month as the BAG. They have various expectations of the BAG, which are often mutually exclusive. Further, the contractors and DOE have their own expectations, which are not always shared by the workers, or which conflict with the workers' goals. These conflicting expectations arise from a lack of clarity and agreement about the scope and goals of the BAG. This report recommends separating the support and counseling function from the policy-advice and educational functions of the BAG in order to resolve concerns about medical confidentiality and to provide an opportunity for the BAG to reconstitute itself with a new charter agreed to by all parties through a facilitated process.

In addition, this report with its information and recommendations should serve as a major input into the ongoing evaluations of CBDPPs, especially regarding compliance with 10 CFR 850. Under the Rule, the Hanford site and the contractors were required to evaluate their CBDPPs by January 2002. To the extent that the evaluations remain open and under review, or the review period is re-opened or extended, this report could be very useful by presenting a broader perspective than is contained within the CBDPPs, and by helping to identify weaknesses attributable to the emphasis in the site's CBDPP on the flow-down of responsibilities from it to

the individual contractors. Weaknesses such as the lack of site-wide measurable goals and consistent standards for performance incorporated into the programs often result in a piecemeal approach and gaps that raise concerns. The importance of establishing site-wide measurable goals cannot be overemphasized.

Recommendations for improvements to the medical surveillance program are designed primarily to make the program more responsive to the needs of the workers, while moving more effectively toward full compliance with 10 CFR 850. The recommendations describe new approaches and standards that will make information, procedures, and access to assistance and second medical opinions available to the workers and their families. The recommended case management team, patient health advocate, and an ombudsman based at DOE-RL are discussed in "The Medical Surveillance Program" portion of the report.

Recommendations for new and consistent standards for monitoring the potential for beryllium exposure and making the results more accessible to the workers are set forth in the section on "Preventing Additional Exposures to Beryllium." These recommendations are intended to enable beryllium-affected workers to avoid further exposure. In addition, these recommendations, along with those relating to establishing a more effective epidemiology program, would greatly enhance the efforts to identify workers at risk and protect them from additional exposure.

The report is organized as shown in the Table of Contents, each section containing both the information and recommendations on the topics in that section. First, in the "Workers' Introduction to the CBDPP," education, training, and risk communication are addressed. In "Barriers to Being Tested," issues surrounding the worker questionnaire and gathering of epidemiological data are discussed. Next is the "Medical Surveillance Program," a description of the program that was created to ensure early detection of beryllium disease; followed by a section on additional "Medical Issues," including access to medical care and medical removal to avoid further exposure to beryllium. The next section, "Preventing Additional Exposures to Beryllium," also addresses efforts to minimize the levels of and potential for exposure to beryllium. There is a section on "Protecting Confidentiality" and, finally, a section on the "Beryllium Awareness Group" which discusses opportunities for the BAG's future activities and contributions.

As part of this analysis, the flow of information, requirements, and services was charted to understand aspects of the various beryllium programs. Barriers and deficits were identified that diminish the quality and efficiency of the programs, and sensitivity to workers and their families. The chart and chart summary start on page 8. The reader will find this chart and the summary a means to become familiar with the intentions and operation of the beryllium programs and to identify key points in the system where there are gaps between requirements, intentions, and results.

The recommendations from the report are excerpted on a Matrix located at Appendix B. The Council provides this tool to assist those seeking to identify next steps. For each recommendation the driver has been identified as **R:** the Rule, 10 CFR 850; **P:** added protection for workers; and **H:** human considerations, such as reducing stress, building confidence in the programs, creating transparency, providing opportunities for input, making the programs more accessible to the workers.

The Council has prepared this report with the health and safety of the workers uppermost in the minds of those who participated in the process. There is an effort at the start of each section and at various points within some of the longer sections to describe the programs from the perspective of the workers.

Workers probably don't spend a lot of time thinking about 10 CFR 850 or Time-Weighted Averages or other factors that must be addressed in the programs and in this report. Their concerns are about how they and their families are going to get through the next test, the next illness, or the possibility of disabling disease. It is up to others to provide access that is transparent, provisions and procedures that work, and protection and support as the workers move from learning about beryllium exposure, to being tested, to returning to the workplace as beryllium-affected workers, and, finally, to leaving the site, perhaps, if the disease progresses, as CBD-disabled former workers. Therefore, the Council has focused its attention on identifying outcomes that will create a safer, less stressful, and healthier environment for beryllium-affected workers, those who are already identified and those who have not yet accessed the programs.

The Council provides this information and the resulting recommendations regarding beryllium-exposed workers at Hanford to all interested parties and trusts that the recommendations, wide-ranging concepts as well as specific calls for action and suggestions for review and assessment will receive consideration and positive attention. To ensure that the recommendations regarding the Energy Employees Occupational Illness Compensation (EEOICP) Act are considered, we suggest that Fluor Hanford forward the relevant information and recommendations to DOE-RL for submission to DOE Headquarters and to the Department of Labor (DoL) for input to the implementation of the EEOICP Act.

Hanford Joint Council for Resolving Employee Concerns

Report Regarding Programs for Beryllium-Exposed Workers

This report was prepared by the Hanford Joint Council, an independent non-profit organization at the Hanford site, chartered to resolve issues related to health and safety. The Council is composed of members from public interest groups, independent public members, a former whistleblower, and managers from Hanford contractors. The views expressed in this report represent a consensus of the Council following extensive review.

This report represents what the Council learned based on the experiences and opinions offered by the beryllium-affected workers, contractor and U.S. Department of Energy, Richland Office (DOE-RL) management, and Hanford Environmental Health Foundation (HEHF) personnel, as well as on research into U.S. Department of Energy (DOE) documents and other literature related to beryllium.

While the Council has done careful research within the bounds of its expertise and resources, its work is not determinative. It has no contract, regulatory, or other oversight responsibilities in regard to the beryllium programs or any of the involved institutions. It should be noted, too, that the descriptions of the workers' understandings and perceptions are included to demonstrate the impact on workers of particular features and structures of the programs and to illustrate for the responsible parties that these matters merit investigation and response by management. As stated elsewhere in the report, management may have a better solution to an issue than the recommendation offered by the Council and should implement the appropriate solution.

Introduction

In 1997, in response to learning about the impact of exposure to beryllium on workers at DOE facilities, the U. S. Department of Energy, Headquarters (DOE-HQ) started the process to promulgate a federal rule, 10 CFR 850,[1] for the development of Chronic Beryllium Disease Prevention Programs (CBDPPs), and at the same time, issued interim instructions for testing and monitoring workers and former workers. The goals of the Rule, which took effect in January 2000, and program are "to reduce the number of workers currently exposed to beryllium in the course of their work at DOE facilities managed by DOE or its contractors; minimize the levels of, and potential for, exposure to beryllium; and establish medical surveillance requirements to ensure early detection of the disease."[2] The Rule came after growing documentation of higher than previously believed exposure levels at DOE facilities and higher than expected numbers of workers who were sensitized to beryllium and of workers with chronic beryllium disease (CBD).

The Rule mandates creation of a registry of beryllium-associated workers,[3] development of a baseline inventory of facilities, development of elements of an epidemiological program, requirements for worker counseling, evaluation, and numerous other elements. Many of these

elements are addressed in this report. Full implementation of the Rule and of the site CBDPP, along with an evaluation of effectiveness, was required by January 2002.[4]

What is Beryllium Disease?

"Chronic beryllium disease (CBD) is a granulomatous lung disease that is caused by the body's immune system response (similar to an allergic reaction) to inhaled dust or fumes containing beryllium metal.... The body's immune system response to beryllium is often called beryllium sensitization. Beryllium sensitization precedes the development of CBD. Sensitization can occur quickly or many years after exposure to beryllium, progressing into disease at a rate of approximately 10 percent a year." 64 FR 68856 et seq.; December 8, 1999, DOE cites "Mortality of the sensitized individuals directly attributable to CBD and its complications is estimated to be 30 percent. This estimate is based on historical data reflecting both the higher levels of exposure that occurred in the workplace prior to regulation of work place exposure in the 1940s and a tracking of the medical history of subjects of CBD over decades. DOE's more recent experience with improved diagnoses and treatments may result in a lower mortality rate for CBD cases." Id.

What is Beryllium?

Beryllium is a toxic substance and a Known Human Carcinogen. [International Agency for Research on Cancer (IARC); recognized by Washington State.] It is a metal, discovered more than two centuries ago, which came into wide use in the 1940s and 1950s. Beryllium was widely used in the DOE complex because of its addition of corrosion resistance, lightweight structural strength, and electrical conductivity in nuclear fuels and nuclear weapons. When machined, or even when beryllium instruments or tools are used, tiny particles can be released to the air and widely dispersed. Particles that lodge under the skin are also known to cause sensitization and skin lesions - See Material Safety Data Sheets (MSDSs) information. Beryllium dust is easily spread. Manufacturers' MSDSs direct that areas of potential release or dust buildup utilize only high-efficiency particulate air (HEPA) filter vacuums.

With the initial diagnoses of four workers in 1998 as beryllium-affected at Hanford, the Beryllium Awareness Group (BAG or the Group) was established under the leadership of DOE-RL, Fluor Hanford and the affected workers. It was to serve not as a typical support group, but as a means for promoting open communications and facilitating worker involvement in a beryllium program. As the number of diagnosed affected workers grew (currently at 30), it became apparent that there was greater potential for such diagnoses at Hanford than had been anticipated. Many of the affected workers and those working with them became frustrated and angry because the various beryllium programs did not meet their expectations.

Similarly, management became frustrated when their efforts to remedy situations that were brought to their attention failed to produce satisfactory results; and, most discouraging, the lack of success resulted in ongoing erosion of trust, even though much useful and constructive work has been done over the years to establish the programs at the Hanford site.

The Hanford Joint Council became involved when two workers raised concerns about the operation and impact of the beryllium programs and were referred by the Fluor Hanford Employee Concerns Program manager to the Council. It became apparent that the Council could not address the concerns of workers and management relating to the Group or the concerns of individuals who had filed employee concerns without a broader review of the CBDPP, including medical surveillance, education, treatment of Workers' Compensation claims, and other elements. The Council has endeavored to perform a systematic assessment of the programs and to discover opportunities for meaningful and effective change by reviewing the requirements of the Rule and the expectations of the workers, and comparing them to the status of the CBDPP as of September 2001.

Changes to the programs have been made since that date, some of them directly responsive to matters raised in this report. For example, Fluor Hanford senior management made valuable improvements to the policy regarding implementation of work restrictions for beryllium-affected workers in February 2002.[5] The Council commends that reform as well as others that have provided greater protections and better access to services for workers. In other instances, the changes have not accomplished the outcomes or met the standards identified in this report. The Council hopes that this report will suggest different approaches that will be found helpful.

The need for an effective site CBDPP is illustrated by:

- Several workers at Hanford have been diagnosed with CBD, which is sometimes fatal. (This report does not refer to specific numbers of employees with CBD for reasons of confidentiality.)

- Thirty workers have been diagnosed as beryllium-sensitized or -affected. Based on current medical knowledge and historical data, most of these are expected to develop CBD. These workers are in a range of occupations including, for example, operators, electricians, carpenters, engineers, and office workers.

- Hanford's entire workforce of over 13,000 (most of whom have not worked with beryllium) was notified of their eligibility to enter the beryllium medical surveillance program. Over 700 workers have chosen to be tested for sensitization to beryllium utilizing the lymphocyte proliferation test (LPT) of the blood. (This compares to several thousand workers tested at DOE's Rocky Flats and Oak Ridge facilities, where, it should be noted, far more beryllium work was performed.)

- After receiving a negative LPT result, a worker may still develop sensitization to beryllium resulting from a previous exposure. (10 CFR 850 and the site CBDPP require offering LPTs at least every three years to workers who enter the medical surveillance program and every year to beryllium-associated workers.)

- Without proper epidemiological and exposure data, it is difficult to ascertain where exposure occurred and impossible to know how many people have been exposed. This is particularly true for historical exposures. Beryllium operations, including production and pilot scale work, were conducted in 16 facilities across the site. While beryllium was stored or used in laboratories in an additional 43 facilities, some of these have little or no potential for exposure except during the decontamination and decommissioning

(D&D) process or demolition. (Three additional facilities were originally identified as "suspect" by anecdotal report, but no evidence was found that beryllium had ever been in them.)

Although not specifically assigned to a facility identified on the Hanford beryllium-suspect facility list, a beryllium-affected worker may have performed work in one of those facilities or in other facilities containing beryllium contamination that were not identified as beryllium-suspect. Reasonable questions have been raised about whether the facilities are properly classified and whether the list will be routinely updated.

In addition, exposure to beryllium could have occurred at a job or a location other than Hanford. As at Oak Ridge and Rocky Flats, work histories of sensitized workers do not always include work assignments in facilities where monitoring showed beryllium at levels above the regulatory action threshold.

The list of beryllium-suspect facilities can be reviewed on the web at http://www.hanford.gov/safety/beryllium/index.htm

The Council's Approach

The Hanford Joint Council conducted over two hundred hours of interviews and has undertaken other efforts to learn about the CBDPP, related issues, and the Group from various perspectives, including managers, health advocates, affected workers, medical personnel, and DOE. To ensure a balanced perspective, the subcommittee that primarily worked on the cases and this study included members from the three types of seats on the Council. It was chaired by one of the neutral members, and included a member who holds one of the public interest group seats, and a member who is one of the representatives of Fluor Hanford management on the Council. This report reflects the consensus recommendations of the full Council, based on review, analysis, and critique of the information acquired through this process.

For medical expertise, the Hanford Joint Council engaged the services of Marc Schenker, MD MPH, a highly qualified occupational medicine expert with background in beryllium exposure, who is chair of the Department of Epidemiology and Preventive Medicine and medical school faculty member at the University of California at Davis. Dr. Schenker's status as a respected professional peer has enabled him to communicate on a peer level with the medical staff at HEHF, National Jewish Medical Research Center (NJMC) at Denver, and the University of Washington (UW) Medical Center in Seattle. He and the Council appreciate the cooperation of those with whom he consulted from these organizations.

He learned about key aspects of the medical surveillance program from the perspective of the providers as well as that of the workers in the context of the available science. He reported his assessment to the Council regarding the medical approaches and confidentiality of the program but not, of course, the confidential medical information of individuals. He found expertise and commitment among the providers. He identified opportunities for improvements and practices to be adopted to increase the confidence of workers, managers, and providers in the medical surveillance program, to increase independence, and to result in more consistent and timely medical judgments. Dr. Schenker acknowledged the difficulties of dealing with this disease, given the current state of medical knowledge, but, at the same time, he noted matters that can be addressed. The Council wishes to express its appreciation for his assistance and contributions to the report. The Council, nonetheless, takes full responsibility for the content of the report.

As part of this analysis, the flow of information, requirements, and services was charted to understand aspects of the various beryllium programs. Barriers and deficits were identified that diminish the quality and efficiency of the programs, and sensitivity to workers and their families. The chart and chart summary follow the next section. The reader will find this chart and the summary a means to become familiar with the intentions and operation of the beryllium programs and to identify key points in the system where there are gaps between requirements, intentions, and results.

For example, the Council found that, even where policies and procedures are in place to address the requirements set forth in 10 CFR 850, lack of effective implementation and communication creates problems and misunderstandings. Although procedures and policies are in accordance with the Rule, in many instances that were brought to the attention of the Council, practice appears not to be. In some instances, new policies and procedures even go

beyond the requirements of the Rule in efforts to address health and safety concerns. But practice has not caught up.

The Council's recommendations seek to address these problems and misunderstandings, proposing effective processes and focused resources as well as open and meaningful dialogue with the workers that would contribute to bringing practice into conformance with policies and procedures – where it counts and in ways that will make a difference for the workers.

Recommendations such as those for a patient health advocate, working with other medical personnel on a case management team; for an ombudsman to assist the workers and to have responsibility and authority to oversee the programs for DOE-RL; for comprehensive reviews of the procedures for medical removal, medical removal benefits, and multiple physician review with the affected workers; for site-wide standards for monitoring and reporting the potential for exposures and restricting access appropriately, along with training for workers and supervisors; for development of a risk communication program using all epidemiological and exposure data and outside expert assistance; and for making the programs and procedures transparent and accessible to workers; these are a few of the many changes the Council recommends as ways to make a difference, to enhance the effectiveness of the programs for beryllium-exposed workers.

The recommendations from the report are excerpted on a Matrix located at Appendix B. The Council provides this tool to assist those seeking to identify next steps. For each recommendation the driver has been identified as **R:** the Rule, 10 CFR 850; **P:** added protection for workers; and **H:** human considerations, such as reducing stress, building confidence in the programs, creating transparency, providing opportunities for input, making the programs more accessible to the workers.

What Was Learned and What Is Recommended

Although the study was initiated in response to concerns raised primarily by the members of the BAG, the information used to develop the information and recommendations came from a wide range of interviews with workers and with others familiar with the CBDPPs. The site CBDPP was reviewed along with each contractor's CBDPP implementation plan, with special attention to the policies and program of HEHF, the site occupational medical provider; the Workers' Compensation program; and the new Energy Employees Occupational Illness Compensation Program (EEOICP) Act, including the Labor Department rules for that program and DOE's implementing policies and procedures. Working initially in response to the workers' concerns, the Council became persuaded after extensive research and interview time with program personnel, that certain issues merit attention in the interest of worker health and safety.

An important finding is that while many want the program to succeed in providing adequate protection to workers, there is no shared standard of success or goals by which to measure success. This lack of measurable goals related to program needs is the root cause of numerous failures to meet the widely varied expectations of different parties, including those of beryllium-affected workers.

The Hanford site's CBDPP seeks to create a framework to achieve implementation of 10 CFR 850. For example, the Rule requires DOE sites and contractors to have goals to reduce exposure to the airborne action level of $0.2\mu g/m^3$ established in 10 CFR 850.25, and to have plans to reduce exposure in areas that are below the action level, as practicable.[6] However, by emphasizing a flow-through of such requirements to the individual contractors and in the absence of site-wide measurable goals and consistent standards for performance, the site CBDPP leaves some gaps.

The information and recommendations are presented following the chronological path of workers as they learned of the possibility of beryllium exposure, entered the medical surveillance and testing program, encountered medical issues, and, if diagnosed as beryllium-affected, became members of the Group. Information sections are numbered, and the numbers are used for reference in the recommendations. Although not always stated, the importance of setting measurable goals as a first step toward achieving effective implementation should be understood.

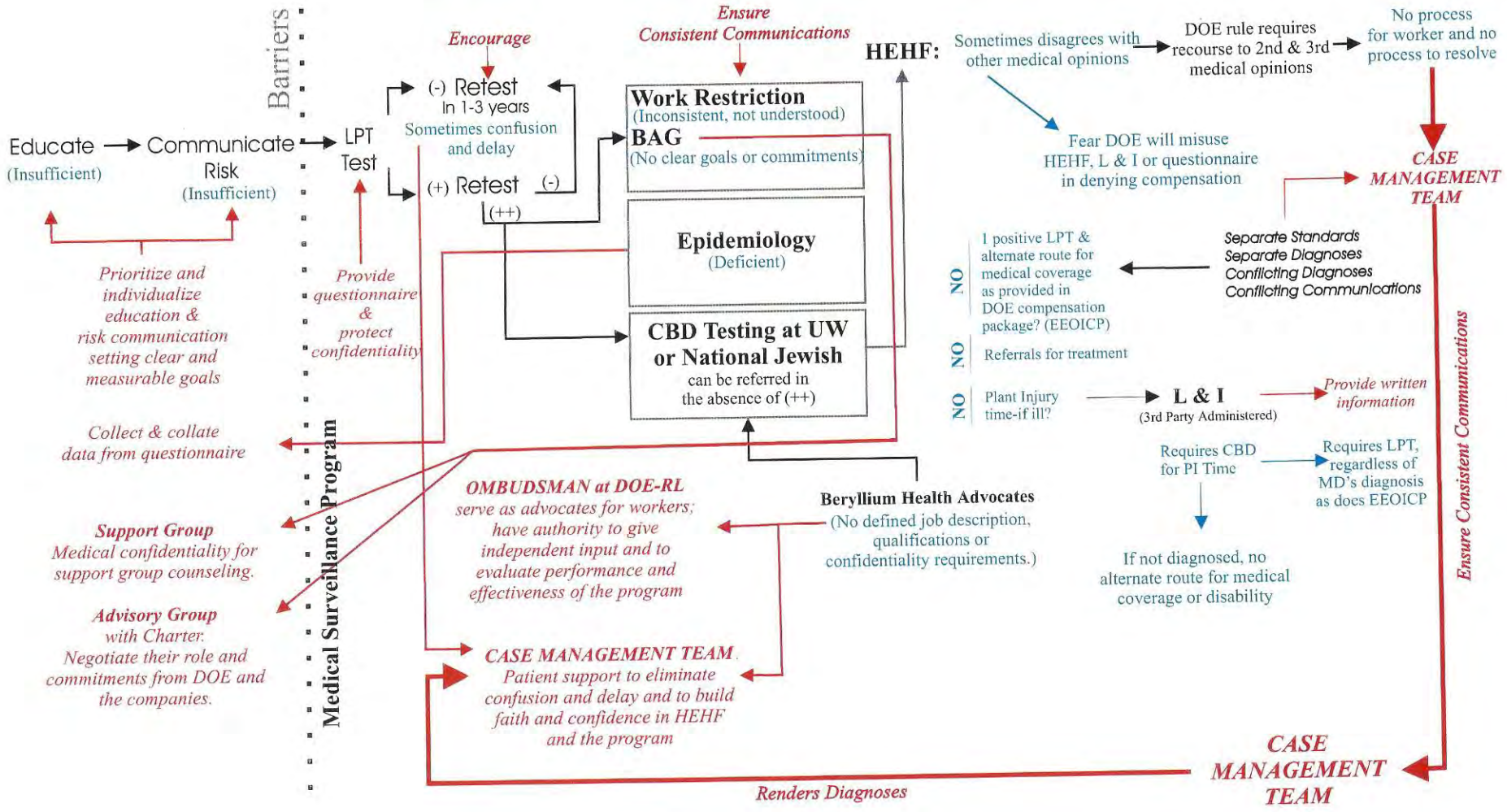
Some changes and improvements to the implementation of Hanford's CBDPP are already underway. Consequently, in order to submit recommendations regarding this evolving program, this report is based on review of the Hanford site CBDPP as of September 2001.

The major sections of this report are:

Workers' Introduction to the CBDPP (WI)
Barriers to Being Tested (BT)
The Medical Surveillance Program (MS)
Medical Issues (MI)
Preventing Additional Exposures to Beryllium (PAE)
Protecting Confidentiality (PC)
The Beryllium Awareness Group (BAG)

VARIOUS ASPECTS OF THE
Hanford Beryllium Program

(As it exists)
(Concerns)
(Recommendations).



Aspects of Various Hanford Beryllium Programs: Following in a Worker's Shoes
A Flow Chart Illustrating How The Programs Exist - Concerns and Disconnects -
With a Summary of *Recommendations for Change*

This chart follows how a Hanford worker moves through the Hanford beryllium programs [in particular the Chronic Beryllium Disease Prevention Program (CBDPP)]. Starting from the left, it shows how the worker goes from learning of beryllium exposure risks, to obtaining a blood test [a Lymphocyte Proliferation Test (LPT)], which is used to diagnose sensitization to beryllium and to screen workers for further testing. Sensitization may be asymptomatic. It is estimated that annually ten percent of sensitized workers develop Chronic Beryllium Disease (CBD), which can be fatal.

Upon request for a blood test, a worker enters the U. S. Department of Energy (DOE) Hanford Site Medical Surveillance Program. Entering the program does not provide for the worker to receive treatment, plant injury (PI) time, medical cost coverage, or compensation under either Washington State Workers' Compensation program (L&I) or the new Energy Employees Occupational Illness Compensation Program (EEOICP) Act, which are shown on the right side of the chart. Onsite occupational medical services and screening are provided by HEHF, the Hanford Environmental Health Foundation, an independent contractor to the U. S. Department of Energy, Richland Office (DOE-RL), shown in the middle of the chart.

1. Education and Risk Communication: Informed choices about whether to be tested rely upon these activities, shown on the left side of the chart. There are no measurable goals based on numbers of workers to be tested or by prioritizing the communication of risk to those workers at facilities - or with work histories - who are at greatest risk. Epidemiological and exposure data would help in risk assessment. Risk communication is not individualized, which serves to lessen perceptions of risk.

Recommendations: Provide individualized risk communication through U.S. mail based on work history, and priority of risk at facility(ies); set clear and measurable goals for education and risk communication based on analysis of populations at risk.

2. Barrier: Even when workers are motivated to be tested and enter the Medical Surveillance Program, one-third do not follow through after receiving the questionnaire HEHF generally requires before a worker can be tested.

Recommendation: Eliminate questionnaire prior to employee being tested. Create a questionnaire that could be used for epidemiology and risk prioritization, that workers would complete while awaiting test results.

3. Initial LPT for beryllium sensitization: This test is administered at HEHF, after the questionnaire is returned. If negative, the worker is advised that he or she can be retested every three years, or once a year if the worker's job involves beryllium. If positive or borderline positive, the worker is retested. A borderline retest may lead to a third test.

4. A worker with two positive tests, or a positive and a borderline test, or symptoms of CBD, is offered steps 5 and 6, described below.

5. Medical surveillance, work restriction, participation in the Beryllium Awareness Group.
   a. Medical surveillance includes offer of CBD testing (step 6).
   b. Work restrictions: The goal is to prevent additional exposure. Previously, they were problematic due to lack of standardization and of clear communication to workers and their supervisors. HEHF has

established standards and is in the process of revising restrictions. Communications problems continue.

Recommendations: Continue to update restrictions; train managers on meaning of restrictions; communicate monitoring data to allow employees to avoid areas with beryllium; offer restrictions when worker has one positive or borderline LPT result, without waiting to receive results for the second test; ensure understanding of removal benefits.

c. Beryllium Awareness Group (BAG or Group): It currently exists as a chartered group open to all affected workers to advise DOE and contractors, and to assist with educational efforts. It serves some functions as a support group, but lacks medical/therapist convener and confidentiality. The Group lacks clear goals.

Recommendations: Work with BAG to create new medically supervised, confidential support group. Have an independent facilitator assist in developing a new charter for current BAG.

6. Offer testing for CBD at one of the two nationally recognized facilities capable of diagnosing CBD: the University of Washington (UW) in Seattle or National Jewish Medical Research Center (NJMC) in Denver. Medical appointments for tests are made by HEHF; travel arrangements by each contractor's Beryllium Health Advocates or the worker's supervisor.

Recommendation: Replace multiple Beryllium Health Advocates with: a patient advocate health professional to make all arrangements, who would be part of a Case Management Team at HEHF; and an independent ombudsman housed in DOE-RL.

7. HEHF is responsible for providing a medical opinion and issuing work restrictions, taking into account the findings, determinations, and recommendations of other medical opinions. If HEHF does not agree with other medical opinions on restrictions or whether symptoms are from occupational illness, access to processes for multiple physician review and for resolving medical disputes is required to be offered. Workers are not adequately informed about these programs.

Recommendations: Create a medical Case Management Team, including an outside physician and contracted occupational medicine/beryllium expert, who are available for consultations; use this Case Management Team to provide required medical dispute resolution process.

8. Compensation and medical surveillance are provided for CBD-diagnosed workers under the EEOICP Act, effective July 2001, [administered by the Department of Labor (DoL) and DOE]; and, by the Washington State Workers' Compensation program (administered by L&I). However, EEOICP does not recognize CBD diagnosis without a positive LPT. Also, without medical consensus on what diseases and conditions are beryllium-related, workers are often found not eligible for compensation and benefits for conditions that are recognized by some health experts as caused or contributed to by beryllium exposure.

Recommendations: Advocate for DoL to change the standard to recognize CBD diagnoses from national experts, regardless of LPT results; provide a process for standardization of the criteria for recognition of symptoms and conditions as being beryllium-related under the leadership of DOE; have an ombudsman available to refer/assist workers in their efforts to access compensation and benefits programs.

Workers' Introduction to the CBDPP (WI)

Workers have been told about the risks of beryllium exposure in the past, but have not received targeted information. The available epidemiological information is not now being used, nor is further information being systematically collected, to notify a worker, for example, that he or she has been identified as having worked in a certain facility during a given time period and that others who worked there during that time have been identified as sensitized. Specific information of this kind would encourage workers to take more seriously the information regarding beryllium exposure.

They would also be more interested in pursuing the question if they had more medical information and information about how it is possible to become sensitized to help them make informed decisions about whether or not to be tested for sensitization to beryllium through the program at the site [provided by Hanford Environmental Health Foundation (HEHF)]. It is important, too, that managers support them in their efforts to gain this information and to take appropriate actions if they are found to be beryllium-affected.

Education

In its efforts to discover the reasons for these problems, the Council was able to learn the following about education efforts and the information provided.

WI-1. There is no consensus around the goals for the education program even though criteria to determine content, audience, and accessibility are set forth in 10 CFR 850.37. Meaningful evaluation of the program, required by 10 CFR 850, is not possible because of the lack of agreement on goals and the inability, consequently, to measure progress toward meeting them.[7] Clarity should be sought, for example, on who should be targeted, whether the programs should be voluntary or mandatory, whether attendance should be documented, and how it can be effectively linked to the medical surveillance program.

Group members believe that broad educational efforts should include peer-based training and should be geared toward communicating the risks of not being diagnosed, the specific risks of exposure from certain facilities, including unidentified pathways (see WI-6 and PAE-7), and training programs for non-beryllium workers whom they believe may be exposed to beryllium in these facilities. Fluor Hanford has developed three employee education/training classes. Input from the BAG was solicited in the development of these classes, and a BAG member is an instructor for one of the courses. These classes are focused on both exposed and non-exposed workers, and include information on exposure risks.

WI-2. In the past, workers were sometimes discouraged from being tested, and efforts to correct these problems were made but have not been entirely successful. Problems exist in the process of educating workers about the risk of past exposure to beryllium and the benefits of being tested for beryllium sensitization. Early participants described requirements, such as the questionnaire, that created barriers to being tested, and conflicting information that made it more difficult to make informed decisions. The benefits of early diagnosis were often not explained and, according to accounts from workers, the twin specters of becoming uninsurable or unemployable if diagnosed were emphasized. Even very recently, problems such as a worker believing he was being discouraged from being tested have been encountered, indicating that

although policies and procedures have been revised, the practice during intake interviews can still be problematic.[8]

WI-3. There is not adequate linkage between training programs and the goals for encouraging LPTs for higher risk workers. The DOE material currently used for training does not include information about hazards and the need for LPTs for Hanford workers at higher risk.[9]

Risk Communication

The Council learned, too, that it has been difficult for the site to collect and process the data that are needed to provide the most direct information to workers about their personal potential for exposure in the past and today. The lack of systematically collected and processed work history data from workers who have been identified as sensitized or having CBD is an unintended result of simplifying the questionnaire that is given to workers who are tested. The absence of appropriate epidemiological and exposure data hinders efforts to identify and educate other workers about the risks arising out of their past employment and the need for awareness of the risks of exposure in their current employment.

WI-4. All employees have received two letters describing the site beryllium program, health effects of beryllium exposure, and the availability of the LPT for sensitization from HEHF. There have been numerous articles in the onsite newsletter, the Hanford Reach, and significant coverage of beryllium concerns in the local news media. Although these have been useful undertakings, information has not been developed and used for an individualized risk communication program.[10] This is necessary to encourage testing and to identify employees at higher risk so that appropriate precautions against further exposure can be taken.

Currently, about 700 workers have been tested. The size of the highest-risk populations, out of Hanford's 13,000 workers, has not been defined due to a lack of sufficient epidemiology, exposure, and work histories, as described below. In addition, the lack of systematically collected and processed work history data from those workers who have been identified as sensitized or having CBD is an unintended result of simplifying the questionnaire given to workers who are tested. The incompleteness of the epidemiological and exposure data and uncertainty about the completeness of the facility contamination surveys hinder efforts to identify and educate other workers about the risk arising out of their past and current employment.

Information has been developed by the University of Washington School of Public Health and Community Medicine, Consortium on Risk Evaluation with Stakeholder Participation (CRESP) using the epidemiological data available from the former worker program, correlating facilities with their work histories. This information could provide additional data to the site programs.

WI-5. The efforts made to identify facilities where workers would have been exposed to beryllium and the time periods when there was a potential for exposure have not resulted in identifying and notifying the workers who were at those facilities during those periods of potential exposure. For example, a worker is not told that he is one of two hundred people who can be placed in Building 333 during the period of greatest risk for beryllium exposure. Instead, he is notified along with every other worker, that he may have been exposed at some time during his work at Hanford, and he is advised to review his work history against the provided

list of facilities identified as beryllium-suspect and to seek testing if he thinks he is at risk of having been exposed.

WI-6. Workers are not aware that they didn't necessarily have to be directly involved in beryllium operations to be exposed. Workers are also unaware that some people can become sensitized from exposure to levels of beryllium in the air that are lower than DOE's regulatory action level.[11] Industrial hygiene personnel (IHs) have communicated risk in absolute terms, despite the medical literature that indicates some individuals are genetically predisposed to become sensitized at lower levels of exposure of short duration,[12] and also despite other workers being diagnosed without identified pathways of monitored exposures. A natural result of such communication is that workers who should be concerned do not believe they are at risk, and thus, feel no need to be tested.

Preventing Discrimination

The Council became aware of situations where beryllium-affected workers wonder whether they are being treated in a disparate manner regarding their employment conditions. Workers should not have to spend time worrying about such questions or the legal issues involved. They simply should be treated fairly and be able to enjoy a positive work environment.

WI-7. As they do with other classes of workers who are protected under civil rights legislation, managers need to recognize and have the necessary tools and information to exercise their responsibilities to ensure that beryllium-affected workers receive appropriate treatment and accommodations. With the problems in implementation of the program and the lack of clear communication between medical personnel and contractor managers regarding work restrictions and the reasons for them, as well as the lack of a full understanding of the program requirements on the part of many responsible parties, the potential for discrimination exists. Personnel actions have occurred that appeared to have been discriminatory.[13] Discrimination against affected workers must be prevented.

RECOMMENDATIONS

1. *Establish and staff a program to develop a risk communication program based on state-of-the-art professional expertise in epidemiology and industrial hygiene data, emphasizing the need for coordination between epidemiology at HEHF and IH on site. The program should include attention to the following:* **(See WI-4)**

    1.1. *Prioritize lists of workers based on level of risk, as evaluated from their work history and epidemiological data.*

    1.2. *Send new individualized risk communication letters through the U.S. mail, urging testing, explaining the benefits of testing, and offering assistance, as well as informing them of the EEOICP Act. Send the letters at the same time to reach employees who worked together and timed to produce a steady rate of response rather than an unmanageable surge.*

    1.3. *Confer with medical experts, communications experts, and representatives of the BAG in designing and implementing the program.*

1.4. Continue to cast the net widely, informing workers of the information set forth in WI-6. The goal should be to develop the best information and to present it effectively to enable workers to make an informed decision about being tested.

2. *Ensure pre-1987 work histories are requested and used, as well as more recent records and information from other sources, such as CRESP, where appropriate, for risk assessment. Integrate with questionnaire results to track potential areas and time of exposure. Use sensitized former workers' work histories as well as current workers'. Utilize this information to individualize and prioritize:* **(See WI-4, WI-5, BT-2)**

   2.1. Risk communication on benefits of testing

   2.2. Training

   2.3. Sampling

   2.4. Posting

   2.5. Communication to sensitized workers regarding avoidance of potential additional exposures and regarding work restrictions

   2.6. Facility rankings regarding likelihood of exposure based on actual common work histories of beryllium-affected employees.

3. *Continue to identify specific workers who have been placed at risk as a result of facilities where they have worked, including storage and disposal locations, and D&D workers.* **(See WI-4, WI-5, WI-6)**

4. *Eliminate barriers and ensure informed participation in the initial testing program with the goal of testing workers at significant risk, and any others who want to be tested. Encourage testing of employees for sensitization.* **(See WI-2, WI-3, WI-5, BT-1, MS-1)**

5. *Schedule confidential interviews for workers who are interested in exploring the option of being tested; provide the best medical information available.* **(See WI-2, BT-1, MS-1, PC-1)**

6. *Review training materials and risk communication materials to include more complete information on the hazards associated with exposure to beryllium, both historic and current, and an emphasis on the link between work in beryllium facilities and beryllium sensitization or CBD. Link the training programs to the workers' signing up for the LPT.* **(See WI-3)**

7. *Establish specific training for all workers, with priority being given to beryllium-sensitized workers. Include information regarding:* **(See WI-1, PAE-4, PAE-5, PAE-6)**

   7.1. The differences between various regulatory levels for exposure;

7.2. The potential for harmful exposure at levels below the regulatory levels, particularly in the case of sensitized workers;

7.3. The need to seek and obtain specific information about how the monitoring data were and are collected;

7.4. How to access monitoring results and how to compare them to various standards.

8. *Provide managers with training necessary to ensure that health and rights are protected and to prevent actual or perceived discrimination against beryllium-affected workers who have work restrictions. This training must emphasize that managers cannot adversely judge a worker's performance due to reduced productivity when this is based on absence due to occupational illness or conformance to a work restriction. Have a standard training module and resource available on the website. Ensure that it is understood that stop work authority extends to a sensitized or CBD-diagnosed worker declining to work in an area with a potential exposure to beryllium, even if the level is below the regulatory action level.* **(See WI-7, PC-3)**

9. *Ensure access by workers to the ombudsman (described in recommendation #8 of MS and Appendix A) to resolve communication problems or disputes as to performance evaluations where there is a concern over whether a job action was discriminatory, to seek to avoid escalation to formal processes.* **(See WI-7)**

Barriers to Being Tested (BT)

Once workers become aware of the possibility of beryllium exposure and become convinced that they should seek to learn more, their next stop is the medical surveillance program at HEHF. They need to receive accurate and current information, and they need to provide information about their work history and health conditions for epidemiological studies.

At HEHF they are offered the opportunity to be tested for beryllium sensitization using the lymphocyte proliferation test (LPT). Their drawn blood is sent to NJMC for analysis, and, since it may take weeks for the results to be available to them, this is a good opportunity for them to take home and complete a questionnaire to bring with them when they return for their test results.

The Council learned that some workers have encountered barriers, such as those described below and in the previous section, during the intake procedures, despite reported efforts by HEHF to reduce or eliminate them. Also, workers are concerned that the information they provide may not be confidential and may be used for purposes other than epidemiology. Generally, however, they support the goals of the epidemiological program and want to see the data used to better inform their co-workers.

BT-1. Many of those who were involved in the early stages of the medical surveillance program described controversy surrounding the requirement that workers complete a detailed questionnaire about their work history and health conditions in order to be tested. There were concerns about confidentiality and the difficulty in identifying accurate work history relative to potential beryllium exposure. The questionnaire was revised and simplified in order to create less of a barrier for workers potentially interested in being tested.

A questionnaire is needed to gather information for the DOE beryllium registry and for epidemiology. Although "(c)ompletion of the questionnaire and any medical tests are voluntary,"[14] workers seeking initial testing were misinformed that the questionnaire is mandatory and required by law.[15] One-third of all workers who request information do not complete the questionnaire,[16] and may believe that they must complete it in order to be tested.[17] As a consequence of not completing the form, they are never scheduled for an exam.

BT-2. Although simplifying the questionnaire to reduce its impact as a barrier to testing was commendable, an unfortunate result has been that epidemiological data are no longer being systematically collected at any point in the process.[18] Epidemiological data are necessary to identify workers at risk. Much greater emphasis needs to be placed on collecting work history data identifying facilities where workers worked (using a more individualized approach and a better-focused questionnaire) and correlating the data with the histories and work locations of other workers who have been identified as being beryllium-sensitized or having CBD.

BT-3. The use of any questionnaire raises issues regarding confidentiality and the potential for abuse.[19] Workers are concerned that breaches of confidentiality could result in information that is designed for medical and epidemiological purposes being used in opposing workers' claims for compensation.[20]

RECOMMENDATIONS

1. *Once the worker has decided to be tested, take blood samples for the tests and ask him or her to take home a questionnaire to be completed for the next visit where the test results will be reviewed.* **(See BT-1)**

2. *The questionnaire could be similar to the extensive one initially used in the program and designed to provide epidemiological data. However, the focus of the questionnaire must be on identifying work locations; unnecessary questions that might discourage the worker from completing and returning the questionnaire should not be included. In providing information for epidemiological purposes, the program must ensure that the worker's identity is not connected to the data in order to maintain confidentiality.*
(See BT-2, BT-3, WI-4, WI-5, PC-1)

3. *Work history, including assignments or time spent in potential suspect beryllium facilities/areas, which are not likely to be in official work records, should be gathered and utilized for epidemiology. Work histories that have been gathered for EEOICPA claims should, with the workers' consent, be utilized for epidemiology. All workers who have already had a positive or borderline LPT or have been diagnosed with CBD should be requested to complete the new, better-focused questionnaire and should be given individualized assistance. Workers should be informed that this information might also be crucial to them for compensation/surveillance programs under the EEOICP Act.*
(See BT-2, WI-4, WI-5, PAE-1)

4. *Evaluate the risk ranking used to identify facilities based on epidemiology and time periods where workers would have been placed at risk for beryllium exposure. Have the HEHF epidemiologist work closely with the DOE-HQ epidemiologist and site IHs to apply findings from the larger population of beryllium-exposed workers to Hanford and to assist with identifying high-risk workers who may not be in the surveillance program. Gather and use epidemiological data in this effort. Suggest that workers provide authorization to start the process of gathering their work histories and using them for epidemiology, rather than waiting until they submit their claims under the EEOICPA and receive requests for information from DoL. Work with the BAG and external experts.*
(See BT-2, WI-4, WI-5)

The Medical Surveillance Program (MS)

When workers decide to be tested and to learn more about beryllium exposure, they also learn that the available information is not definitive. There is ongoing research; but their questions cannot always be answered. If and when workers are identified as sensitized by the results of the LPT, this lack of hard data is particularly frustrating to them and their families. And, sometimes, it's difficult for them to know what questions to ask of whom.

Other sources of frustration add to the difficulty. Workers have had bad experiences that indicate that the design and implementation of the medical surveillance program are problematic. The program, while carried out at HEHF, is the product of many inputs and policies from DOE, coordination with outside medical authorities, and interactions with site contractors; and there is lack of clarity regarding its objectives, priorities, and practices. As a result, expectations are not based on an understanding of the purposes of the program and, therefore, are often not met. These perceived failures of the program lead to dissatisfaction and disagreements among the various players. The continuing conflict has made it difficult for all parties to keep sight of the common goals of providing worker protection and ensuring early detection of the disease. [21]

Few Definitive Answers

The medical community does not yet fully understand the effects of exposure to beryllium, although there is ongoing research.[22] *There is uncertainty about whether some of the health problems that affected workers experience are caused by beryllium exposure, or which pre-existing conditions may be made significantly worse. Because of the nature of CBD and its range of symptoms and the difficulty of diagnostic test procedures, it is not always easily diagnosed. After diagnosis, workers and families have important questions about prognosis and preventing further risk. The system for seeking answers is confusing to workers and their families, particularly those with more complex cases. In addition, the limitations in medical knowledge often make it difficult for the medical surveillance program to answer their questions. This is a cause of frustration that can be addressed.*

Confusion and Delay

Some of the issues that can be resolved are: delays in obtaining test results; not being placed on a work restriction when they have a result that calls for more testing; delays in being scheduled for the next level of tests for CBD; misunderstandings about travel arrangements to the UW in Seattle or to NJMC in Denver for the CBD test; and delays in learning the results of the LPTs or CBD tests. If issues can be referred and steps taken toward resolution, they are much less frustrating and anxiety-producing. Workers need a place to turn for help in dealing with the delays and confusion at a time when they and their families are frightened and stressed.

MS-1. The confidence and trust of some workers in the program have been eroded by confusion and delay in obtaining test results. It can take four to six weeks to receive initial results of LPTs, and scheduling for a retest, as required for a positive diagnosis, may take several more weeks. Receipt of a work restriction after the results are known may also take weeks. This may result in a worker informing his or her manager of results and having an expectation of a work restriction while the manager has no formal communication or written guidance on which to act and an insufficient understanding of the requirements of the Rule.

Delays are also encountered in scheduling CBD testing for sensitized workers at either NJMC or the UW, making travel arrangements for testing, and receiving reimbursement for expenses incurred and for time taken from their accruals. Inadequate and misunderstood travel arrangements and perceived lack of clarity in arrangements for reimbursement have caused stress to the workers and their families at a time and in a situation that is already frightening and stressful. It should be noted that this testing is extremely physically and mentally demanding.

Further exacerbating the situation, it can be several months before results are obtained from the full battery of tests at either medical center. Workers have difficulty obtaining answers regarding the status of their test results and in eliminating unnecessary delays, including the delays in transmission of results. Some delays are often unavoidable, but many can be reduced or eliminated by better coordination and communication as well as by greater structure and consistency in certain administrative and related practices in the program.

Medical Treatment

The Council learned that, as with anyone receiving medical results, the workers want the best information they can get and want differences in medical opinion noted and resolved expeditiously. A provision is made in the Rule for second and third medical opinions, but the workers aren't aware of this in many cases and don't know how the process would work. Another problem is that they can't find physicians outside HEHF in the Tri-Cities area who know much about beryllium sensitization and CBD. Since HEHF is not a treatment facility, some workers feel abandoned by the medical community and need a resource to put them in touch with reliable medical care.

In addition, the Council learned that those in the medical community who do study beryllium aren't in agreement on the full range of diseases and conditions that might be beryllium-related, might be exacerbated by beryllium exposure, or might compound the effects of beryllium exposure. Although research is ongoing, scientific findings are not yet available to resolve these questions. Workers can get different answers from different "experts" and receive varying, and to them unexplained, answers to their applications for work restrictions, compensation, benefits, or medical surveillance.

MS-2. 10 CFR 850 provides a process for resolving conflicting medical opinions. The Rule requires the employer to establish a multiple physician review process for reviewing initial medical findings, determinations, or recommendations from medical evaluations under the surveillance program. Employers must notify workers of this right and then participate in and pay for the process if the worker responds to the employer's notice in a timely manner as set forth in the Rule.[23]

Following resolution of any medical dispute under this process, the Site Occupational Medical Director (SOMD) is required to act consistently with the findings, determinations, and recommendations of the third physician unless the SOMD and the worker reach an agreement that is consistent with the recommendations of at least one of the two other physicians.[24]

Workers are not necessarily given information about this multiple physician review process, including the obligation for the SOMD to act consistently with medical opinions the workers

have received under the medical surveillance program, at times when the information is applicable to their immediate medical circumstances, although the provisions are spelled out in policies and procedures.[25]

Since the reasons or process for choosing one diagnosis over another or for accepting one interpretation of results rather than another are unclear to workers, the trust of many workers in HEHF and, consequently, in the entire program is compromised. Continuing failures to find the means to communicate clearly and consistently between the worker and the medical personnel result in workers perceiving that they are being individually and systematically denied information and appropriate referrals. They don't recognize that the difficulties they experience represent failures of the system, rather than reactions to them or to the specifics of their cases.

MS-3. Adding to the problem is the fact that there is a shortage of physicians in the Tri-Cities region available and qualified for referral for further diagnoses and ongoing treatment of these unusual and complex cases. This problem is compounded by the reality that there are few doctors willing to accept patients for reimbursement under the Workers' Compensation program.[26]

Additional problems result, workers say, from the limited role assigned HEHF's primary occupational medicine physician for beryllium and the lack of access to an external expert.[27]

MS-4. Some health effects of beryllium exposure, ranging from skin lesions to cancer[28], are recognized by medical experts and are documented in Material Safety Data Sheets (MSDSs).[29] Workers' experience in seeking coverage of various illnesses has led to a perception that HEHF and Workers' Compensation acknowledge only pulmonary health effects from occupational exposure to beryllium.[30] To illustrate, workers have reported that HEHF denied that skin lesions are a recognized health effect of exposure to beryllium and denied access to site occupational medical services, including referrals and photographic documentation of the condition.[31]

CCSI (the third-party administrator of the Workers' Compensation program for DOE at Hanford) does not have any written material explaining what specific illnesses will be covered as caused by or related to CBD.[32] CCSI stated that it will not deny coverage for illnesses associated with beryllium exposure, if the worker's attending physician has positively identified the cause as CBD and submits objective medical evidence. Workers understand that obtaining the documentation can be a time-consuming process, but approval of claims is sometimes delayed beyond their understanding.

After their claims are approved, workers can experience other problems that are due to required procedures that can result in gaps in their coverage. For example, absences from work are not covered by Workers' Compensation if a physician has not seen the worker at the time of the absence to verify that the worker cannot report to work and that the reason is exposure-related illness.

Several Hanford workers have received external expert diagnoses of significant health effects caused, or contributed to, by occupational beryllium exposure or CBD. In addition, an HEHF occupational medicine physician has at times provided such diagnoses or opinions. However, these diagnoses and opinions have not necessarily been used to report occupational illness, for issuance of work restrictions or temporary or permanent medical removal, to provide site

occupational medical services, or to ensure that workers' medical and sick time is recognized as related to the occupational illness. This causes direct financial harm to workers who have to utilize their personal leave time for such illness, despite the diagnoses.[33]

Different Standards

The Council learned from workers that they encounter not only differences of opinion among medical personnel, but also differences of standards among agencies responsible for providing assistance to affected workers. Once the doctors provide a diagnosis, it may or may not satisfy the standard being used by a particular agency for a particular benefit or treatment. If the doctor is not knowledgeable about the various standards and requirements, his or her diagnosis may fail to qualify the worker for benefits partly because it is not stated and supported in the way required. Also, doctors may not be able to assign a specific cause to the ill effects the worker is experiencing.

An event that compounded workers' difficulties was the decision in 2000 to raise the standard for LPT results to be considered "positive." Workers could lose their eligibility for the medical surveillance program, work restrictions, and other benefits and protections because of this change. The reason for the change was to reduce the risk of false positive results. There is a significant risk that workers would be incorrectly identified as sensitized and be placed on work restriction and be put through unnecessary and potentially risky clinical examinations.

MS-5. The medical community has not reached consensus and the science is not available to show that some of the diseases and conditions that are thought by some physicians to be beryllium-related actually are. Nor is there a common regulatory basis for compensation, except in cases of pulmonary CBD supported by a positive LPT result. Medical experts are limited by how much science has been done.[34] DOE does recognize the potential for negative health effects from beryllium exposure, and currently provides compensation for pulmonary CBD under the EEOICP Act. A complicating factor is that some workers may have suffered multiple chemical exposures in the workplace, which may cause similar negative health effects, or which may compound the effects of beryllium exposure.

Unfortunately, worker exposure histories at DOE facilities are incomplete and often inadequate to document specific exposure. Because State Workers' Compensation requires evidence that the cause of the illness is related to the specific recognized exposure, workers tend to seek to have their illnesses addressed as related to beryllium exposure, which provides compensation, while the cause may lie in multiple exposures, exacerbation of other illnesses from the exposure, or other causes entirely.

MS-6. The criteria for diagnosing beryllium sensitization and CBD are not standardized among the various agencies. In fact, even programs within DOE have adopted different standards and vary in their acceptance of diagnoses. Eligibility for benefits, which is linked to the diagnoses, is not consistent. The situation for the beryllium-affected worker is, therefore, more complex than it need be and creates uncertainty and potential for personal financial loss. For example, because the LPT is used to screen workers for sensitization to beryllium, it has, in some circumstances and by some agencies, become the only acceptable way to diagnose a worker as meeting the definition of beryllium-affected. However, some workers with CBD do not have positive LPT results.[35]

This standard (two positive LPT results at the new, higher level, addressed in MS-8) does not conform to medical information that CBD or berylliosis can occur without positive test results. Workers can be diagnosed with CBD by a doctor with nationally recognized expertise in beryllium and, as a result, participate in the Hanford Site Medical Surveillance Program. However, despite such diagnoses, they may be denied compensation or long-term medical surveillance under the EEOICP Act.

MS-7. Although the Workers' Compensation program at Hanford is a third-party-administered system; that is, DOE uses a private company to administer the program, state law requires that the program be no more restrictive than the state's rules. Decisions regarding claims are made on the basis of medical opinion supported by objective medical evidence submitted by the worker's attending physician. In practice, this means a diagnosis submitted by NJMC or the UW.

There appears to be a need for greater clarity in defining for the worker what is typically required for a claim to be accepted and how the processes work. Problems arise because workers do not understand the details of the claims process, are not told the standards used to evaluate claims, and do not know how to use the appeals process to challenge decisions or to resolve delays in responding to their claims.

Some workers report that CCSI has taken several months to respond to their claims. This perception may result from the workers' not understanding the process, not supplying adequate information, or from routine delays that are not, in the normal course of business, explained to the claimant. Whatever the cause, the question is worth pursuing to learn whether there are systemic problems with the response procedures or whether there are problems in the perceptions of the workers that can be addressed through enhanced communications.

It is important to avoid establishing inflexible standards for diagnoses because clinical and scientific knowledge is changing and expanding. The observation that diagnoses evolve as cases progress illustrates the limitation of rigid classification systems and supports the idea that hard and fast rules cannot be written without losing the flexibility to be responsive to the medical community. However, the procedural rules and assistance should be available to workers who seek resolution of their claims.

MS-8. Making matters more confusing and restrictive to workers and their families, as well as to those interested in their well-being, there was a decision to increase the standard by 25% for a positive LPT result. The change occurred in August 2000, before the effective date of the EEOICP Act. The reason for this new standard was to reduce the number of false positives and to optimize the specificity and correctness of the test results[36], but that was not made clear to the workers. Its adoption without adequate explanation has left workers guessing the worst about the motivation.

The new standard has also resulted in workers being removed from the medical surveillance program as beryllium-affected, the lifting of work restrictions, and loss of released time to participate in the BAG. It might also affect their eligibility for Workers' Compensation and for compensation under the EEOICP Act.

Even if the new standard for the LPT is medically appropriate for diagnostic or research purposes, a review should be undertaken to determine if it is an appropriate standard for

medical screening and risk reduction. Questions have been raised about whether this is "good occupational health and preventive medicine practice."[37] With the requirement for two positive LPT results at the new, higher standard for a worker to be considered beryllium-sensitized and to be given a work restriction for avoidance of additional exposures to beryllium or a full medical removal from potential exposure, there may not be adequate protection for workers.

Gaps and Disconnects

As mentioned previously, the Council found gaps between requirements, intentions and results. Workers are sometimes unable to anticipate what to expect next. Looking toward the future, as current workers transition into the former worker programs and later to the DoL program, they are uncertain about what to expect. Some of the surprises they have encountered and shared with the Council are described below.

MS-9. Current workers are eligible to participate in the site medical surveillance program, and retired workers are covered under the former worker programs. 10 CFR 850.35 guarantees to workers who are removed from work to avoid exposure, continuity of all pay and benefits for two years.[38] This should include participation in the site beryllium medical surveillance program even if they go on long-term disability leave. However, workers who are already on, or anticipate having to go on, long-term disability leave are not aware that they are eligible to continue in the program during their two years of medical removal protection. In addition, it is not clear whether they are eligible for the site medical surveillance program if their leave exceeds two years. In the future, more beryllium-affected workers may need long-term disability leave before they become eligible for retirement, during which period of disability they will also need medical surveillance and testing.

There is no clear DOE policy or procedures to provide continued medical surveillance, monitoring, and other medical services to affected workers who leave the Hanford site. Funding and continuation of the former worker programs is far from certain. EEOICP Act standards for access to the Department of Labor (DoL) medical monitoring program differ from DOE's 10 CFR 850 program.

MS-10. The recently established DoL and DOE Office for beryllium (and radiation) compensation claims is not easily accessible to current workers. This office was established to assist workers under the EEOICP Act. The office is open at times when Hanford workers are at work (8:30 a.m. to 12:00 noon; and 1:00 p.m. to 5:00 p.m., Monday through Friday) or by special appointment. Affected workers seeking time off to visit the office are uncertain about how to charge their time.

MS-11. Under 10 CFR 850.35, workers are guaranteed medical removal protection benefits for alternate job placement; training; and continuity of salary, benefits, and medical surveillance for up to two years.[39] However, work restrictions have not consistently provided for medical removal (no exposure above background levels); nor are the medical removal protection benefits necessarily made clear to the workers and understood by them at the time and under the circumstances when the information would be most valuable. When workers are offered medical removal, information regarding medical removal benefits should be provided at the same time.

MS-12. As set forth in the preceding paragraphs, it is difficult for beryllium-affected workers to learn about and correctly interpret the many different standards and requirements associated with the various medical and benefit programs. These are issues worthy of attention in order to have a credible, effective, and efficient program.

Dispersed Responsibility and Lack of Uniformity Across the Site

Finally, in what is fortunately not yet a typical scenario, as workers move through the medical surveillance program, they can receive bad news at every juncture; for example, positive LPT results, CBD symptoms and positive CBD test results, unresolved disagreement among doctors, ineffective work restrictions, insensitive supervisors, new medical problems, inability to continue to work. When they seek to learn about and understand the options that should be available at every point along the way, it is crucial that the information be readily accessible and that a knowledgeable and sensitive person be responsible for interacting with the worker and the worker's family.

MS-13. Analysis and charting show inconsistencies and disconnects in the implementation of the beryllium program that are due to dispersed responsibility and lack of standardization from company to company. A prime example of this is the role and job descriptions for the companies' beryllium health advocates (BeHAs). BeHAs are employees of the individual companies and do not have a standard job description or set of qualifications. From company to company, there have been many different definitions of, and approaches to, the work and responsibilities of the BeHA. Since goals for the position have not been clearly and consistently defined, performance cannot be measured; and expectations have not been articulated and made consistent with a set of clear program goals. This arrangement results in duplication of efforts and, presumably, greater cost.

Assistance to workers experiencing confusion and delays in diagnoses was perceived as a major element of the work to be done by the BeHA, but with no uniform job descriptions or stated qualifications for the position, this vital medical support function has been outside the required scope of duties or qualifications. Thus, in some instances this assistance was provided; at other times it was not. In addition to leaving workers confused and frustrated, this could have direct medical consequences, including additional exposure or misdiagnoses of other medical conditions. In addition, even though DOE and the site pay for the cost of testing, the delays tend to undermine the workers' trust and confidence in DOE, the contractors, and the program.

RECOMMENDATIONS

1. *In order to achieve a major focus on consistency and to ensure confidentiality, sensitivity, timeliness, and accuracy in providing information to workers and their families, in arranging appointments for tests, in conducting medical reviews, in making referrals, in providing information to managers, in supplying information for the consistent application of company policies and procedures, and in supporting the worker as needed, establish a "case management team" (CMT) at HEHF for beryllium cases. The purpose of the case management team, comprised of medical personnel, a manager, and a "patient health advocate," would be to address diagnostic issues, accommodation, recommended surveillance, environmental assessment issues, medical referrals and follow-up, logistics for testing, compensation, and communication issues. The patient health advocate should be a*

health professional (an R.N.) dedicated to patient support, replacing the role of the individual companies' BeHAs.

(See MS-1, MS-2, MS-3, MS-4, MS-13, WI-2, MI-1, PC-1, PC-3)

1.1. Discontinue the position of BeHA and replace it with an HEHF single contact (the patient health advocate), responsive to the CMT, and with a DOE-RL-based ombudsman.

1.2. Hold regular meetings of the CMT and keep complete and accurate meeting minutes, with due regard for confidentiality, in order to improve communications, to resolve conflicting views and diagnoses, to provide for more consistent and clear case information and progress reports, and to reduce inconsistencies and misunderstandings among HEHF staff and between HEHF staff and affected employees.

1.3. Provide the best available medical information from the time of the pre-test interview throughout the time the worker is connected to the program. Ensure that the information communicated to the workers has been fully vetted by the CMT.

1.4. Ensure that medically advised surveillance, documentation, or diagnostic activity (including photographic documentation of a physical condition), are performed without interference.

1.5. Provide a full and accurate briefing to the workers on their condition when the information is available, and provide a channel for employees and family members to ask and have answered further questions. Provide access to resources for counseling and other assistance to the employees and their families.

1.6. Provide oversight, as a function of the patient health advocate, of all matters having to do with the medical testing and reporting; e.g., tests scheduling, document referral and reporting, and travel arrangements. Establish and meet standards for moving people to and from each stage starting with initial testing, getting results, and next steps.

1.7. Provide linkage, as a function of the patient health advocate, to the epidemiology program and the industrial hygiene program to provide information and reassurance to the individual worker that the personal data that are volunteered and collected help inform what is done on the site in relation to beryllium programs. Transparency in this connection will help workers understand what is happening and how important it is.

1.8. Ensure that there is sufficient administrative support provided to the functions assigned to the CMT, being particularly aware of the many duties assigned to the patient health advocate and the need for the person in the position to be sensitive and responsive to the concerns of the patients.

2. Establish, standardize, and oversee procedures to inform managers in a timely manner, as a function of the patient health advocate; support the relationship between the workers and

managers without violating confidentiality restrictions and provide affected employees and their managers with consistent, non-contradictory information.

(See MS-1, MS-12, MS-13, WI-7, PC-1, PC-3)

2.1. Provide managers with the knowledge and understanding needed to interact appropriately with workers identified as beryllium-affected. For example, managers should be aware of the confidentiality requirement and the need to conform to the work restrictions.

2.2. Meet with managers and workers to review work restrictions and make them easily understandable and not open-ended or unnecessarily restrictive.

2.3. Provide managers with information about time-coding policies for approved beryllium activities and medical testing.

2.4. Notify managers in a timely manner about appointments, testing, travel schedules, and other matters that are necessary for the worker's supervisor to know.

2.5. Following one positive or borderline positive LPT blood test, offer workers temporary work restrictions to reduce/eliminate potential exposures to beryllium. Do not wait for second or third tests to offer preventive action. Provide full information about the meaning of the tests, the numeric chances of its being a false positive, the differing medical opinions, and the obligation of the employer to find alternative work or provide for medical removal benefits. Enable the worker to make an informed decision.

2.6. Ensure sensitized (including after one positive or borderline test) workers and their managers know how to access facility sampling data and history to implement restrictions/removal to prevent exposures. Provide managers with training on accommodation of beryllium-affected workers.

2.7. Give managers the opportunity to ask questions of the patient health advocate and give them phone numbers and access to a web-site-based resource to have further questions answered.

3. HEHF should resolve differences in medical diagnoses or test result interpretations, utilizing the case management team and a formal process, which is communicated to employees.

(See MS-2, MI-2)

3.1. Ensure workers understand their rights to second and third medical opinions, and to a resolution process, as provided under 10 CFR 850.

3.2. Provide a clear process to obtain additional medical opinions, and a process utilizing the CMT to resolve differences of opinion. Ensure workers are aware of the ombudsman's availability. (See recommendation #8)

3.3. Ensure that workers understand that medical uncertainty and lack of consensus among medical doctors is a result of the limited amount and particular focus of

scientific research that has been done. Medical doctors are limited by the scientific findings.

4. *Guarantee confidentiality in all parts, aspects, and levels of the medical surveillance program. Establish requirements for confidentiality and enforce them vigorously. Limit the number of HEHF and other personnel who have access to confidential material and require documentation when files are accessed. Strictly preclude non-medical personnel from having unauthorized knowledge of individual medical information.* **(See BT-3, PC-1, PC-3)**

5. *Guarantee timely reimbursement of funds and personal time taken from individual accounts, such as Personal Time Banks, sick leave, or vacation, for beryllium-related approved medical activities.* **(See MS-1, MS-12, MS-13)**

   5.1. *Ensure that workers entering the screening process and proceeding through the testing program do not have to use personal leave time.*

   5.2. *Adopt a policy and process to restore personal leave time retroactively to those workers who submit requests along with records of time used for the screening and testing program since its inception.*

   5.3. *Adopt a policy and process to restore personal leave time retroactively to those workers currently diagnosed as beryllium-affected who submit requests with records of personal time used for beryllium-related absences since the inception of the program.*

   5.4. *Establish policies so workers, when diagnosed with CBD, will have timely restoration of any personal leave time used for previous absences resulting from their beryllium exposure.*

   5.5. *Ensure that workers diagnosed with CBD have access to plant injury (PI) and/or short-term disability leave so that they can work partial weeks or days in order to accommodate their physical limitations.*

   5.6. *Ensure that employees receive timely reimbursement of any personal funds or consumer credit used for allowable travel expenses when proceeding through the testing process.*

   5.7. *Conduct a site-wide review of criteria for eligibility for PI time, sick leave, disability leave, Workers' Compensation, and other benefits to make them consistent for all beryllium-affected workers.*

6. *Continue to provide access to NJMC and the UW for diagnostic testing, and utilize those diagnoses for eligibility for Workers' Compensation and CBD-related PI time.* **(See MS-3, MS-4, MS-5, MS-6, MS-7, MS-12)**

   6.1. *HEHF should provide referrals or access to a "personal attending physician" with expertise in beryllium-related illnesses for diagnosis and treatment.*

6.2. *The third-party-administered Workers' Compensation program should provide written notice that even in the absence of positive LPT results, a diagnosis of CBD by a qualified medical doctor is sufficient to meet the eligibility criteria for coverage.*

6.3. *DOE and DoL should recognize a diagnosis of CBD by a qualified medical doctor as sufficient for purposes of the new compensation and medical surveillance program (EEOICP). The rule governing EEOICP should be changed if necessary.*

6.4. *When there are qualified medical diagnoses of illnesses, or that symptoms and conditions are caused by, or their severity is increased by, occupational exposure, these diagnoses should be used to report occupational illness and the reported occupational illness should be recognized as eligible for Workers' Compensation.*

6.5. *Standardization of the criteria for recognition of symptoms and conditions as having beryllium-exposure causation (e.g., skin lesions) should occur under the leadership of DOE. To decrease the site-to-site variability in eligibility and diagnosis, periodic national conferences should be convened with DOE support to develop consensus for diagnoses of CBD and related illnesses, beryllium-exposure causation, and sensitization.*

6.6. *Informational seminars should be provided to the BAG on requirements for eligibility for Workers' Compensation Programs.*

7. *The EEOICP Act compensation system should provide for the flexibility to recognize individual diagnoses that do not meet the standard criteria. In particular, the program should not have positive LPT results as an absolute requirement, but rather should seek to review a full clinical history, in which LPT results are one of several important tools. This is more important if the criteria for a positive LPT result do not recognize the areas now considered "borderline," or do not recognize the potential for LPT results to be masked or to change over relatively short periods of time.* **(See MS-5, MS-6, MS-8, MS-12)**

8. *Provide workers with convenient and comfortable access to an ombudsman, located at DOE-RL, replacing one role previously given to each company's separate BeHA and adding an assessment/evaluation function. This ombudsman should have the authority to assist employees and to ensure that CBDPP policies and expectations are met. The person would be able to answer beryllium-affected workers' questions and give them timely support before referring and delegating to those responsible for the matter being raised. The ombudsman would be ultimately accountable for putting the workers in touch with the right resources and making certain that the resource person provides the support or answers to which the workers are entitled. (Reference: Ombudsman Job Description in Appendix A)*
(See MS-1, MS-2, MS-7, MS-11, MS-12, MS-13, WI-7, MI-3, PC-1, PC-2)

8.1. *Inform workers that the ombudsman is available to assist in ensuring that time commitments for medical surveillance are reasonable and are met. The primary responsibility for ensuring that time commitments for medical testing and diagnoses are reasonable and are met will lie with the CMT patient health advocate.*

8.2. *Inform workers that the ombudsman is available to assist in ensuring that: concerns about timely processing of Workers' Compensation claims are resolved and the details of the claims processes, including the appeals process, are understood; and concerns about medical removal protection benefits under 10 CFR 850.35 are resolved.*

9. *Place workers who are on long-term disability leave into the former worker programs or maintain them in the on-site current worker medical surveillance program. Fully inform beryllium-affected workers, both those who are currently being identified and those who were identified previously, of their medical removal options and medical removal protection benefits, including provision for their continued participation in the site beryllium medical surveillance program. Offer each beryllium-affected worker medical removal to the extent it is consistent with the new standard work restrictions, and inform him/her of the protection benefits. Contact beryllium-affected workers who were laid off or moved to long-term disability leave after diagnosis, inform them of the protection benefits, and offer them continued participation in the site medical surveillance program.*
(See MS-9, MS-11, MI-2, MI-3)

10. *DOE should establish a national policy to ensure that all beryllium-associated and beryllium-affected workers receive seamless, long-term continuity of access to medical surveillance and medical services after leaving DOE or DOE-contractor employment.* **(See MS-9)**

11. *Review the new, more restrictive standard for a positive reading on the LPT indicating beryllium sensitization and determine whether it is an appropriate standard for medical screening and risk reduction or overly exclusive for purposes of determining work restrictions for the employee to avoid additional exposures to beryllium. Also review what is used to determine the standard of "3.0" in other laboratories. Utilize external advisers.*
(See MS-8)

12. *Establish worker-friendly hours for the new DoL/DOE compensation claims office. Also, establish a policy for Hanford site workers to account for their time used to visit the office during work hours.*
(See MS-10)

Medical Issues (MI)

Workers look to the medical community for answers once they learn they are sensitized to beryllium. Their first point of contact is HEHF; but HEHF has not yet fully developed the procedures and organizational safeguards to be entirely responsive to the needs of these workers.[40] In addition, the uncertain and changing state of medical knowledge and the rapid growth of the site's and DOE's programs have created a challenging environment. Nonetheless, there are opportunities for improvement and some initiatives have been proposed and others undertaken in the past few months that should be effective for the future.

MI-1. Beryllium-affected workers, especially those diagnosed with CBD, often feel abandoned by the medical community, specifically because of the lack of knowledge of their private physicians. The extensive recommendations (#1 and #3 in MS) for a case management team and for contracting with a nationally recognized center, such as the UW or NJMC, to provide access on site on a regular basis for an outside expert physician are based on proposals from Dr. Marc Schenker and discussions with Dr. William Brady, the SOMD from HEHF.

Medical Removal from Exposure

Workers want to know what their rights are regarding protection from further exposure to beryllium. The Council learned of problems associated with removing affected workers from situations where they may encounter further exposure.

MI-2. 10 CFR 850.35[41] requires removal from exposure to beryllium if the SOMD determines in a written medical opinion that it is medically appropriate to remove the worker from such exposure. 10 CFR 850 also requires that when an external medical opinion recommends removal, the SOMD must take this into account in making his recommendations. If the SOMD's recommendation is in conflict with another medical opinion, 10 CFR 850.34 requires that an opportunity be provided to reach a determinative finding.[42]

As mentioned in MS-2, the opportunity to resolve conflicting medical opinions and to reach a final medical determination through multiple physician review is required by 10 CFR 850.34. It appears that workers do not understand they have an opportunity to invoke this provision as well as the provision for temporary medical removal from the potential for exposure pending a final medical determination.[43]

In one case, an external expert medical opinion stated that the patient "should never return to beryllium exposure during the course of his career." However, the worker was not offered a position away from what he considered the potential for exposure at his current job. Many workers raise this issue. Though the work places of current employees meet the limit of the regulatory action level, medical opinions are clear that sensitized workers are to avoid exposure even at that level, since it potentially could increase risk. HEHF recognized the need to state restrictions as a specific exposure level, and then moved in October 2001 to reduce that level to 5% of the regulatory "action level." However, as of December 31, 2001, a number of previously issued work restrictions had not been revised and reissued. HEHF notes that, as of March 15, 2002, it is in the process of updating all work restrictions.

Under 10 CFR 850.35, upon the SOMD's determination that it is medically appropriate, any worker with diagnosed beryllium sensitization or CBD, even prior to final determination, is

guaranteed the right to temporary removal to an alternate workplace where beryllium exposure is as low as possible, but in no event at or above the action level.[44] Currently, workers must generally have a second positive or borderline positive LPT before receiving from HEHF a work restriction or directive for removal.[45] After receipt of the second LPT results, it often takes weeks before HEHF provides a written recommendation for work restrictions.[46]

When a worker has one positive LPT result, there is a significant likelihood that the worker is sensitized to beryllium. In addition, there is a 15% likelihood that a worker with a borderline LPT result will receive a positive result on the follow-up test.[47] Therefore, offer of removal from the potential for exposure to beryllium would be an appropriate precaution after one positive or borderline result without waiting weeks for the results of the second test.

Medical Removal Protection Benefits

One of the problems associated with removing workers from situations where they may encounter further exposure is the need to find alternative placement for the worker. Management may not have comparable positions available, the worker may not want to leave his or her current position or understand the available options, and managers may not have any idea how they should address these requirements once they have been notified of work restrictions.

MI-3. DOE sites were advised in June 2000[48] that "permanently restricted" for workers with CBD or sensitized means "no exposure (above background in your area) to beryllium."[49] As of December 31, 2001, a number of affected workers had not received new work restrictions;[50] nor are they necessarily given notice of their rights to medical removal and medical removal protection benefits at times when the information is applicable to their immediate medical circumstances. Under these circumstances, some of the workers may have returned to jobs with the potential for exposure believing that they must in order to maintain their salaries, responsibilities, benefits and access to the beryllium medical surveillance program.

10 CFR 850.35 provides workers with rights to continuity of salary and benefits for two years if no equivalent job that meets the medical removal or work restriction criteria is available[51], or if they take long-term disability leave, which is at a significant reduction in salary. If workers do not understand these "medical removal protection benefits,"[52] they are not able to make properly informed choices about seeking either removal from exposure or long-term disability leave. Their concern about losing salary and benefits, including participation in the beryllium medical surveillance program and testing and treatment at NJMC or the UW, weighs heavily against accepting a potentially lesser position under a medical removal restriction or taking long-term disability leave. The Rule is designed to protect workers from having to make such a choice. [53]

Workers who have taken long-term disability leave without continuing their access to the site beryllium medical surveillance and testing program and with a loss of medical benefits for their illness have suffered disruption of medical surveillance and testing that appears to be inconsistent with 10 CFR 850.35.[54]

RECOMMENDATIONS

1. *Provide better access to individual consultation on medical issues from medical personnel who are knowledgeable about the health effects of beryllium.*
   (See MI-1, MI-3, MS-2, MS-3, MS-4, MS-8, MS-12, PAE-3, PAE-4)

   1.1. *Provide workers with confidential access to a doctor, in whom the workers have confidence and who is a member of the CMT. Authorize this doctor to serve as the workers' attending physician for purposes of providing documentation to CCSI for intermittent absences from work for causes related to beryllium exposure; for example, to provide an opportunity for workers to obtain a medical opinion regarding whether illnesses for which the worker saw a local physician were related to beryllium exposure.*

   1.2. *Contract with doctors from NJMC and/or the UW to come to the site for monthly information meetings and individual and private physician consultations.*

   1.3. *Provide for a beryllium-expert doctor to be available for consulting with doctors in the community who are called upon to treat beryllium-affected workers.*

2. *Provide information and assistance to doctors who are asked to treat beryllium-affected workers for beryllium-related diseases and illnesses to encourage them to participate in the Workers' Compensation program. This may require recognition of beryllium-related illnesses other than pulmonary illness.* **(See MI-1, MS-3, MS-4, MS-5, MS-6)**

3. *Provide access to individual consultation about employment compensation issues that are affected by the medical status of the affected worker; e.g., Workers' Compensation, short-term and long-term disability leave, paid time off for beryllium-related medical absences. Coordination between medical providers and program gatekeepers should be expedited.*
   (See MI-1, MI-2, MI-3, MS-4, MS-5, MS-6, MS-7, MS-11)

4. *Review and revise work restriction policies and procedures.*
   (See MI-2, MI-3, MS-2, WI-7, PAE-1, PAE-2, PAE-4, PAE-5, PAE-6)

   4.1. *Ensure work restrictions are binding on the workplace.*

   4.2. *Update the work restrictions of all beryllium-affected workers.*

   4.3. *Offer temporary work restrictions immediately upon receipt of a positive or borderline LPT result in order to prevent potential exposure to beryllium.*

   4.4. *Recognize medical work restrictions and removal recommendations from outside medical experts or, in the absence of such recognition, provide for speedy resolution by the CMT of any disagreement on work restrictions or removal recommendations.*

4.5. *Make it easier and more practical for workers and management to meet work restrictions through better compliance with the requirements of the Rule for posting and notification of monitoring results.*

4.6. *Offer full removal from a facility where an exposure may have occurred when medically advised that a worker should avoid all potential exposure and provide alternative work placement.*

4.7. *Consult with the unions and the BAG about the processes to use in the reassignment of workers to ensure consideration of the workers' preferences and contractual protections.*

5. *DOE-HQ management should identify beryllium-affected workers who have left employment on the site through layoff or long-term disability leave without having the provisions of the medical removal and medical removal protection benefits explained to them, and should determine in each case whether their employer should: (a) find them an equivalent position (free from beryllium exposure) for which they are qualified or may become qualified with a short period of training; (b) retroactively provide up to two years of medical removal protection benefits, including salary and medical benefits (including beryllium program benefits).*

(See MI-3, MS-9, MS-11)

6. *DOE-RL should ensure that each beryllium-affected worker, including those who have left employment or taken long-term disability leave after being diagnosed, is informed in writing of the medical removal options and medical removal protection benefits under 10 CFR 850.35. Workers who have taken long-term disability leave after receiving positive LPTs or being diagnosed with CBD should receive medical surveillance, testing and treatment (including counseling) for at least two years. DOE-RL and the contractors should consider what benefits should be provided after the minimum two-year period.*

(See MI-3, MS-9, MS-11)

6.1. *Consult with the BAG to create a program to offer each worker medical removal, pursuant to the new standard work restriction, with training or a job transfer to positions of equal salary and benefits; or, provide full salary (including overtime expectation) and benefits for up to two years (or until such a position becomes available), pursuant to 10 CFR 850.35. Provide access to the site beryllium programs, including testing and counseling.*

Preventing Additional Exposures to Beryllium (PAE)

When workers receive an LPT result that shows they may be sensitized to beryllium and are advised to take precautions to avoid further exposure, they need to be provided with the tools and information to enable them to take those precautions as soon as possible. The Council learned of an array of reasons that workers are stymied in their attempts to take this responsibility for their own health and safety.

HEHF should give them a work restriction that prevents exposure above background levels, the equivalent of medical removal. Their supervisors should make sure they are assigned to work only in facilities guaranteed not to have beryllium above background levels. However, HEHF doesn't generally issue, or, alternatively, offer work restrictions until workers have had two positive results,[55] and HEHF work restrictions are treated only as recommendations by some contractors. Another problem is managers and supervisors often don't have the information they need to understand the practical application of the restriction.

Lack of understanding comes from lack of training about the definition of the various regulatory limits for beryllium exposure and lack of information about the presence or absence of beryllium contamination in the beryllium-suspect workplaces as well as in other workplaces. In the absence of this information, supervisors have difficulty fulfilling their obligations to workers who seek protection from additional exposure.

Workers also lack training and information. They don't know how to find and to interpret the results of previous or recent surveying activities in buildings on the beryllium-suspect list. Once they find those results, they don't know how to compare the survey results with the restriction level they have been given. They can become further confused by the way the results are currently reported, a way that can lead to incorrect interpretation by workers and management.

Workers discover that, as in the case with medical information, information regarding the potential for further exposure to beryllium and adequate precautions to be taken, is not definitive, and, therefore, is not accessible. It often appears to them that decisions are based not on what's best for beryllium-affected workers, but on other considerations.

They may or may not be aware of the differences of opinion among parties with authority and information around the issues of adequate standards for sampling for surface contamination, the level of surface contamination that might create airborne contamination, the most efficient way to measure a worker's exposure, the level of exposure an affected worker should avoid and other issues of measurement, monitoring, and reporting the condition of facilities with the potential for beryllium contamination.

Nevertheless, if improvement in protection is possible through a more cautious standard and greater clarity on the facts, requirements and tools, workers could be better supported in their efforts to take responsibility for their own health and safety. The Council presents below its assessment based on research, discussion, interpretation, and repeated questioning and checking on facts, information and beliefs. The information and recommendations the Council provides make reference, generally, to the need to provide protection to affected workers. This focus is not to be construed to indicate that other workers need not be protected. All workers

and their supervisors need complete data, provided by IHs fully educated and informed regarding the potential for exposure and opportunities for avoiding exposure.

PAE-1. Beryllium-contaminated buildings (identified on the beryllium-suspect facilities list[56]) are sometimes used for office space and other functions unrelated to the facility itself. Work is sometimes performed in areas physically removed from the occupied area and that work may disturb surface contamination. Concerns exist, including concern based on actual experience at other sites documented in DOE-EH (DOE Environment, Safety, and Health) Program's "Lessons Learned" program,[57] that there may be surface contamination that was not identified. This could result in airborne beryllium exposure during work that disturbs the dust, even though the ambient air monitoring results for the facilities were below the regulatory airborne action limit of 0.2$\mu g/m^3$. There is inadequate epidemiological data to determine if beryllium sensitization has occurred as a result of being housed in such facilities, but this practice should be avoided and work groups should be moved to non-beryllium facilities, consistent with 10 CFR 850.25(b)(2) which directs employers to take steps, as practicable, to further reduce exposure to detectable beryllium to levels below the action level.

For instance, at least one work group of engineers, whose work is not related to or dependent upon the location, was housed in a non-beryllium area of Building 333. Several workers who have been identified as sensitized to beryllium or diagnosed with CBD worked in Building 333. As noted elsewhere, there are inadequate data to do epidemiological studies to determine if there is a likely link to a time period or specific location in this facility as a cause for this sensitization. Building 333 has restricted beryllium-contaminated areas that are no longer used, where the 1999 or 2000 sampling results of removable surface contamination were above the Minimum Detection Limit (MDL) of 0.5$\mu g/100cm^2$. Fourteen percent of the surface samples exceeded this level and the area where these samples were taken, a former fuel production area, is now posted and access is controlled. (Note: Fluor Hanford management discontinued use of this facility in October 2001.)

In other cases, workers continue to enter beryllium-suspect facilities without awareness of monitoring results showing low ambient air levels and a variety of dust levels. "Once sensitization has occurred, it is medically prudent to prevent additional exposure to beryllium", noted DOE in the explanation of its Final Rule.[58] Most sensitized workers receive medical advice or work restrictions to avoid additional exposure to beryllium. Continued use of suspect facilities, when not necessary, cannot be called "reasonable accommodation", and could create liability as well as lead to additional illness. Monitoring data from such facilities should be posted.

Confusing Information

The need to understand different standards, different sampling methods, and the terminology to describe them can be overwhelming for the workers. There are regulatory action limits, minimum detection limits, ambient air samples, airborne beryllium exposure, surface beryllium contamination, background levels of beryllium, and more. Even for those who understand all of the above, the answers they come up with are not always clearly defensible. And sometimes, no one is asking the right questions.

PAE-2. The presence of airborne beryllium at levels below the workplace standard in 10 CFR 850.23 of 0.2$\mu g/m^3$, 8 hour TWA is not a guarantee that workers will not become sensitized,

nor is that level necessarily a safe exposure for a sensitized worker.[59] Thus, in April 2000, Hanford reduced the work restriction for sensitized workers to limit their exposure to airborne beryllium to 0.1μg/m^3, and in October 2001 adopted a much lower limit of 0.01μg/m^3 to restrict them from working in areas with airborne beryllium exposure above background levels. Ambient air samples of listed beryllium-suspect facilities utilized for workspace show that occupied areas are well below the DOE regulatory action level for airborne beryllium exposure.[60]

However, surface contamination above background levels can lead to airborne exposures[61] and can pose a risk for beryllium exposure through the skin. The numerical correlation between the level of surface contamination and a level of airborne beryllium that would pose a health hazard has not been determined.

Sampling for surface contamination in many Fluor Hanford facilities has been based on a method with an MDL of 0.5μg/100cm^2, which raises questions because 1) 10 CFR 850.31 does not permit equipment or items with surface contamination exceeding 0.2μg/100cm^2 to be removed to non-beryllium work areas, and 2) the Hanford Contractor Site CBDPP, Sec. 4.0 defines "beryllium-contaminated material" as "equipment and/or items discovered to have surface contamination levels greater than 0.2μg/100cm^2 or the background level for local soils (dust), whichever is greater."

Workspaces that were surveyed using an MDL of 0.5μg/100cm^2 should be specifically identified to workers and supervisors, or, alternatively, a mechanism should be implemented whereby each task to be performed in a beryllium-suspect facility should be evaluated for potential beryllium contamination and exposure prior to performing the work.

Opinions differ on whether steps should be taken to identify work areas where workers might encounter surfaces with contamination exceeding 0.2μg/100cm^2 and on recommending the use of protections such as respiratory equipment in those areas.[62]

Opinions also differ, on whether it is necessary to survey for contamination on surfaces located in non-beryllium work areas using an MDL capable of detecting 0.2μg/100cm^2 in order to protect sensitized workers from exposure above background levels, per their medical removal rights and medical opinion.[63]

The questions behind these differences of opinion are:

1. At what level of surface contamination does a potential for airborne beryllium exposure occur?

2. From what level of surface contamination should beryllium-affected workers be restricted in order to be protected?

3. What steps should be taken to protect non-beryllium-affected and non-beryllium-assigned workers?

In the absence of agreement on the answers to these questions, the policy questions to be resolved by the responsible parties are:

1) Is the standard of 0.2μg/100cm^2, adopted with the stated purpose of protecting non-beryllium workers from exposure to surfaces above that level, already applicable to surfaces in areas of any facility that are released to non-beryllium work or uses?[64]

2) Should facilities that were surveyed using an MDL of 0.5μg/100cm^2 be resurveyed using an MDL capable of detecting 0.2μg/100cm^2? If so, on what timetable and with what priorities?

3) Should respiratory equipment be required in workspaces that were surveyed using an MDL of 0.5μg/100cm^2?

4) Should respiratory equipment be required in other situations, regardless of the MDL used for surveying, where hidden particulate contamination may exist, and, if so, under what circumstances and conditions? (See PAE-3 below for additional information.)

PAE-3. "(R)esults from area monitoring (of airborne beryllium) have been shown to significantly underestimate actual exposure levels."[65] Workers' exposure is best measured by personal monitoring, by sampling the air within the breathing zone of the workers. At Hanford, ambient air monitoring is used to determine if an area exceeds the action level.

In one documented experience at Rocky Flats, equipment was moved exposing previously undetected beryllium contamination, resulting in airborne contamination levels during work that were 500% above the regulatory action level, despite surface level samples having been below an MDL of 0.1μg/m^3. Unfortunately, it may take up to two weeks to receive the results of airborne or breathing zone sampling during actual work. Thus, the DOE-EH Program recommended that workers use respiratory protection for work in facilities where beryllium contamination may be disturbed and recommended additional sampling, even when surface sampling measurements are below the regulatory level of 10 CFR 850.31.[66]

After testing positive for sensitization or being diagnosed with CBD, workers are not offered personal monitoring or additional sampling of removable surface contamination in their usual work location. Under the Hanford Worker Bill of Rights, however, personal air monitors are made available upon request of the worker. It is unclear whether all workers are aware of this provision. It seems clear that they are not given sufficient information to make an informed decision about whether to make the request. If workers do receive information, it may not be supportive of using such monitoring, leading some workers to believe that such a request would invite derisive responses.

PAE-4. Beryllium-affected workers are given medical recommendations to avoid exposures to beryllium. Recent work restrictions implemented by HEHF have been expressed as a numerical exposure level. In April 2000, the numerical level was reduced to<0.1μg/m^3 airborne, which is half of the action level with no reference to surface contamination. Previously, there had been no standardization or number used for the work restrictions. In October 2001, HEHF recommended a further reduction in the work restriction by a full magnitude, down to 0.01μg/m^3.

Workers are not aware that a cautious approach to protecting their own health and safety would be to ensure that they do not enter facilities with potential for surface contamination above background levels. The information they receive often appears to discount the risk of

further exposure in facilities where sampling has shown that the surface contamination level is below $0.2\mu g/100cm^2$.

Work packages, Automated Job Hazard Assessments, and the accessible beryllium facility list do not express exposure potentials in numerical terms, making it difficult for workers or managers to compare them to work restrictions. If work restrictions cannot be met, then as noted in the preceding MS and MI discussions, 10 CFR 850.31 requires that workers with positive LPT results or CBD be offered removal to jobs with no exposure to beryllium, if available, or medical removal protection benefits to maintain salary and benefits for up to two years.

Lack of Information

The information that workers need in order to make informed choices about their own health and safety is not always available for a variety of reasons including lack of access to monitoring results and questions about whether the results are meaningful, whether testing provides a complete picture, and what it should mean to them as individuals. They lack understanding of medical removal benefits, DOE guidance and interpretations of the federal regulations, and other information that would enable them to make fully informed decisions about their own health and safety.

PAE-5. Workers lack easy access to check on sampling results (airborne or surface) for areas where they may be assigned. Results of monitoring are not routinely provided to individual workers in writing or posted in easily accessible locations, as required by 10 CFR 850.[67] The Rule requires that potentially affected workers be offered temporary duty where exposures are "as low as possible" pending final diagnosis, and, where appropriate, medical removal. Without communicating the results of monitoring, these requirements cannot be met. Workers diagnosed as sensitized are not able to ascertain their potential exposure from accepting a work assignment, or from everyday duties, particularly in non-regulated suspect facilities.

PAE-6. IHs on site often communicate "no beryllium found" when sampling results indicate that no beryllium was found above the detection level of the analytical method used. Also, in some instances, IHs advocate for sensitized workers to rely on an opinion that air-monitoring data showing surface contamination not exceeding $0.2\mu g/100cm^2$ in the workers' workspaces meet the standard for medical removal requirements. Work restrictions at Hanford recently were set at 5% of the action level for airborne contamination to ensure adequate protection of the beryllium-affected worker. Therefore, the sampling data, the detection levels, and the positions advocated by IHs need to be reviewed for compliance with that standard.

Workers are also concerned that some areas may not be monitored thoroughly; particularly where D&D work is being carried out involving potential beryllium-contaminated ductwork. DOE's Implementation Guidance states that the hazard ranking of facilities should be based significantly on sampling of surfaces in less accessible areas, such as ductwork, behind walls, and under equipment.[68] Special attention is needed for D&D work, and for handling D&D wastes at waste storage and disposal facilities. Not all Hanford workers performing D&D work or demolition in any building on the suspect facilities list are considered beryllium-associated workers. Commendably, Fluor Hanford employees who are assigned to work in/around the ducts in these buildings have now been so designated.

PAE-7. The possibility of unidentified releases of beryllium creating unknown contamination sources or exposure pathways has not been reviewed for its impact on proposals to reuse facilities or on proposals to remove structures. If an outside, non-DOE contractor were to utilize any of these facilities, the workforce would not have the benefits of the surveillance (both exposure and medical) and the controls of the DOE program. This issue has been treated primarily as a workplace occupational exposure control issue, and not as a hazardous substance release. It should be treated as both.

PAE-8. The beryllium-suspect facilities list contains categories with misleading titles. For instance, some of the sixteen facilities listed as "cleared, except for D&D, Building Modifications," may continue to have potential for exposure to beryllium.[69] Nine facilities on the facilities list are identified as "not characterized." Some of these had significant potential for exposure in the past, including spills and small explosions, and may still have equipment surfaces that exceed the public release limit of $0.2\mu g/100cm^2$.[70]

PAE-9. Unlike the site-wide approach to radiation, each contractor has its own beryllium sampling practices and exposure control policies. The different practices among contractors in regard to beryllium result in varying degrees of protection for workers and confusion about the necessity for various protocols. This undermines workers' confidence. A site-wide approach, such as that represented by the radiation surveillance and sampling manual, would provide consistency and be more effective. In addition, the site would benefit from an evaluation of the protocols, enlisting external expertise on industrial hygiene practices such as is available from NJMC.

Fluor Hanford recently adopted a policy that provides added protection to workers in beryllium-suspect facilities engaging in work above the eight-foot level or in work that is likely to disturb surface contamination. Unfortunately, this level of protection is not offered to the employees of other contractors; and, further, when many of the beryllium-suspect facilities now covered by this policy are moved to the new River Corridor contractor, a change scheduled for later this year, the policy will not necessarily cover the facilities or the workers.

The benefits obtained from linking the Automated Job Hazard Analysis, which is used for work package planning, to the suspect facilities list are lessened due to different Minimum Detection Limits (MDLs) being used to sample for surface contamination in the various beryllium-suspect facilities. For example, one contractor used an MDL of $0.5\mu g/100cm^2$ while another uses $0.1\mu g/100cm^2$, rendering the meaning of "no detectable surface contamination" widely variable.

PAE-10. Some facilities with beryllium wastes (including liquid wastes), beryllium tools, and beryllium used in research are not on the beryllium-suspect facilities list. In addition, workers have raised concerns about the sampling protocols used for these facilities, such as wipe down of toolboxes and tools prior to sampling. There is also confusion regarding research facilities: whether they are included under the provisions of 10 CFR 850, such as being listed on the beryllium-suspect facilities list and being considered facilities to which beryllium-affected workers should not be assigned. Consistency and transparency in collecting and disseminating industrial hygiene data are important to building confidence in the integrity of the program.

RECOMMENDATIONS

1. *Use of beryllium-contaminated buildings when not necessary to the work housed in them should be discontinued. A survey of work activities housed in each beryllium-contaminated facility should be conducted as soon as possible. Workers should be moved out of such facilities, particularly when there are a number of sensitized workers housed in them. This would reduce potential for exposure to the maintenance staff as well as to the primary staff housed in these facilities.*
   (See PAE-1, MI-2)

   1.1. *A controlled program should be used to test vacuum dust from non-beryllium work areas in buildings with beryllium contamination, as an aid to assuring that the level of beryllium in dust does not exceed the level identified in work restrictions.*

2. *The Hanford site and contractor CBDPP documents should specify a maximum allowable removable surface contamination level for beryllium in non-regulated areas. It is recommended that the current regulatory criteria of 0.2μg/100cm² for beryllium-contaminated equipment released to the public or to non-regulated areas be considered for adoption as the standard and applied to non-regulated areas in Hanford facilities.*
   (See PAE-2, PAE-6, PAE-9)

   2.1. *DOE-RL should adopt site-wide standards and a manual for beryllium sampling, monitoring, and exposure reduction.*

   2.2. *DOE-RL should use external experts to assess the adequacy of the site contractors' beryllium sampling, monitoring, and exposure reduction programs to ensure consistency with DOE implementation guidelines and other practice standards.*

3. *Reasonable accommodation to sensitized workers must assure they are not housed in facilities where there is a potential for additional exposure to beryllium.*
   (See PAE-1, PAE-2, PAE-5, PAE-6, WI-7, MI-2, MI-3)

   3.1. *Relocating a sensitized worker away from a beryllium-suspect facility, physically separating their office from others in the group, and holding staff meetings in the facility that has the potential for additional exposure to beryllium, is not a sufficient or reasonable accommodation.*

4. *The beryllium-suspect facilities list should be reviewed and updated. The category titles should be modified to reflect the potential for exposure. Facilities with removable surface contamination above the standard for release criteria in 10 CFR 850.31 should be specifically and prominently noted. Updates to the list should occur routinely.*
   (See PAE-1, PAE-2, PAE-4, PAE-5, PAE-6, PAE-8)

   4.1. *Monitoring results for surface and airborne levels of beryllium should be posted at facilities and on the website linked to the beryllium-suspect list, to enable affected workers to avoid potential exposure. Monitoring results, including notice of the MDL used, should be a part of work package planning and communication, with accommodation offered affected workers to meet their work restrictions.*

5. *Facilities on the beryllium-suspect facilities list that were surveyed for removable surface beryllium using an MDL of 0.5μg/100cm² should be considered as and listed as having the potential for beryllium exposure. Until a detailed review of the facility has been performed, or sufficient sampling data have been collected to document non-exposure, all work being performed in these facilities should be evaluated to determine the potential for beryllium exposure.*
(See PAE-2)

   5.1. *Opinions differ on whether these facilities should be subject to new surveying using an MDL capable of detecting 0.2μg/100cm², giving priority to facilities accessed by beryllium-affected workers and to buildings where D&D or other work that may disturb surface contamination is planned, or whether it is sufficient to review existing sampling data that were collected using the MDL of 0.5μg/100cm².*

   5.2. *There is agreement that any new sampling should use an MDL of 0.01μg/m³ for airborne beryllium and an MDL capable of detecting 0.2μg/100cm² for surface contamination. In addition, any equipment removed from an area with potential beryllium contamination should be sampled to verify that the surface contamination is below 0.2μg/100cm².*

6. *The policy issues raised at PAE-2 merit thorough review by the responsible parties and attention by DOE in order to develop site-wide policies. During the interim, in the interest of timely attention to worker health and safety, contractors should consider adopting policies applicable to their own operations.*
(See PAE-2)

7. *Personal air space monitoring, surface sampling of the areas around their normal workspace, and respiratory protection should be specifically offered to all beryllium-sensitized or CBD-diagnosed workers along with information to enable them to make an informed decision. At minimum, this would provide assurance that their sensitization was not caused by, or risk being exacerbated by, any unidentified exposure during the course of their normal workday. Personal air monitoring also provides a far more accurate assessment of exposures.*
(See PAE-3, MI-2)

8. *Specific training should be established for all workers, including information regarding the differences between various regulatory levels for exposure (e.g., the difference between the Permissible Exposure Limit, and the "action level"); the potential for harmful exposure at levels below the regulatory levels, particularly in the case of beryllium-affected workers; and how to access and compare monitoring results to various standards.*
(See PAE-1, PAE-2, PAE-4, PAE-5, PAE-8, WI-1, MI-2)

   8.1 *Beryllium-sensitized and CBD-diagnosed workers should be informed that prior postings or statements that levels of removable beryllium (dust) were non-detectable were based on a lab analysis method with a detection limit that was two and a half times higher than the permissible level for removable beryllium contamination on equipment or items to be released for use outside of a regulated area.*

   8.2. *All IH personnel across the site should be specifically educated on the data and issues around the action limit and the occurrence of illness below it.*

9. *Work restrictions or medical removal should be expressed both as a numerical exposure level and as restrictions against working in facilities in the various categories on the beryllium-suspect facilities list. The Automated Job Hazard Analysis used for work package planning is an easily accessed and understandable tool, which is already linked to the suspect facilities list. This allows a worker the opportunity to decline work in a suspect facility. If the work restrictions stated no work in facilities on the list, or in some categories of listed facilities, then the restriction would be easy to follow, and the worker would not face pressure to perform a task in a location where he/she might be exposed to beryllium.* **(See PAE-4, PAE-5, PAE-6, MI-2, MI-3)**

10. *Goals should be set for reducing exposures in or around facilities where sampling shows airborne beryllium levels below the regulatory action limit, but where there is removable surface contamination present, if the facilities are to be used.* **(See PAE-2)**

11. *Workers engaged in D&D or demolition of any beryllium-suspect facilities should be treated as beryllium-associated workers and monitored as part of the medical surveillance program. Appropriate controls for preventing exposure to beryllium are needed in these facilities before demolition and removal of debris.* **(See PAE-6, WI-1)**

    11.1. *Provide training about beryllium risks and handling to all employees working in D&D or demolition of buildings where beryllium has been stored or utilized, including all work involving ductwork. This training should include risk communication and testing for sensitization for all contractors.*

12. *Other agencies such as the U. S. Environmental Protection Agency and the State of Washington Department of Ecology with jurisdiction over releases or potential releases from facilities within the boundaries of a Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Superfund site, Model Toxic Control Act (MTCA) site or Resource Conservation and Recovery Act of 1976 (RCRA) Treatment, Storage, and Disposal unit must be informed that there are potential beryllium residues in facilities prior to undertaking D&D work, demolition or approval of risk assessments and work plans. On-site inspection staffs of regulatory agencies should be offered LPTs and provided with notice of beryllium monitoring results and hazards.*

    Beryllium wastes should be identified for toxicity, reported and properly disposed with adequate controls. DOE should review with the Department of Ecology and the Environmental Protection Agency whether beryllium tools that may have met the definition of beryllium-contaminated material have been disposed in the unlined soil trenches of the Low Level Burial Grounds and report if any beryllium wastes have been disposed without characterization. Information about the process and access to the report should be provided to workers. **(See PAE-7, PAE-10)**

Protecting Confidentiality (PC)

The question of confidentiality was raised time and again by workers, managers, and medical personnel interviewed by the Council. Workers who discover they have become beryllium-sensitized or have CBD have the same reservations about sharing this information that many people have when they learn of any serious illnesses or early warning signs. The requirement to protect medical confidentiality may seem obvious as one thinks about it in the abstract; but, practically, people forget.

PC-1. Many of the people interviewed indicated a concern with the lack of clarity with regard to expectations for safeguarding others' medical information. Some failures to maintain confidentiality are due to a lack of understanding that information one worker may give to another about his or her diagnosis or condition should not be considered public information, simply by reason of its having been shared in a one-on-one conversation. Individuals fail to recognize that it is still medically confidential information. Breaches and perceptions of breaches of confidentiality have created great distrust toward the program, toward some individuals in positions of responsibility, and among members of the BAG.

PC-2. The confusion surrounding the role of the BAG has contributed to the problems regarding confidentiality. The Group is not a counseling or support group, yet it has grown to serve this function, especially during the core group meetings. In the BAG setting, workers share highly charged emotional issues in the presence of company managers, the BeHAs and others who do not have a duty to maintain medical confidentiality[71] and who may perceive their duty as requiring reporting. There is no trained therapist or facilitator present with an ethical duty to maintain confidentiality and to ensure that all participants understand and agree to such ground rules.

PC-3. Although policies are in place, there are concerns expressed by a number of workers that medical information has been given to employers beyond the minimum necessary, and that HEHF has allowed medical information to be inappropriately shared by staff at HEHF with no medical reason to have access.[72]

RECOMMENDATIONS

1. *HEHF, other contractors, and individuals working with beryllium-affected workers and the BAG should, in a coordinated way, review their policies and safeguards on confidentiality of medical information and ensure that all who are in a position of handling such information are aware of their responsibilities.* **(See PC-1, PC-2, PC-3)**

2. *Where it is determined to be necessary to share medical information, the need must be reviewed with the worker and written permission obtained.* **(See PC-1, PC-3)**

Additional recommendations appear in other sections: #5 in Workers' Introduction to the CBDPP, #2 in Barriers to Being Tested, #s 1, 2, 4, and 8 in The Medical Surveillance Program, #s 1 and 3 in Medical Issues, and #3 in The Beryllium Awareness Group.

The Beryllium Awareness Group (BAG)

The BAG was established in 1998 following the initial diagnosis of four beryllium-affected workers. DOE-RL, Fluor Hanford, and the identified workers recognized a need to provide a vehicle for the workers to gain knowledge about this disease that had so unexpectedly changed their lives and to stay cognizant of DOE's developing response to this exposure problem at its sites. The contractors' opportunity to seek advice from the workers and to use them as a sounding board while developing the program was apparent from the beginning. Yet, a sufficiently structured process for carrying out these functions was not developed and workers in the program as well as managers became frustrated.

The formation of the BAG tracked DOE's national effort, which began in 1996, to involve worker and union stakeholders in developing the risk communication program, training, and assessment of the effectiveness of the medical surveillance program.[73] DOE's national Beryllium Program, reflecting national reports on risk management and assessment, has urged since 1997 that "it is important and beneficial to involve stakeholders in this concern (working safely with beryllium)... Risk communication is now accepted as a dialogue among interested parties..."[74]

The affected workers at Hanford struggled to learn all there was to know about beryllium and its effects for they were facing a potentially life-threatening disease. They wanted information in order to monitor and effectively advise on the program that was being developed for beryllium-exposed workers. Without a process and structure to do this work, the Group failed to function well in the new environment of growing numbers of affected workers, increased medical surveillance activity, more rules and procedures, and an overwhelming amount of information from many sources that needed to be vetted.

All these matters seemed to some members to require the attention of the Group, and they were not able to keep up with it all. Some members thought they shouldn't try, that it wasn't within the scope of the Group; other members thought they had to try, to fulfill a responsibility to themselves and other workers who might be exposed. The Group wanted to operate independently, and DOE and the contractors appeared not to provide enough guidance about what they expected of the Group.

Today, with about seven times as many beryllium-affected workers, a charter approved by DOE-RL and contractor management, and an established framework (10 CFR 850) for dealing with some of the issues workers face, there are still many opinions among the members and among others involved with the beryllium programs about what the Group should do, who should participate, and how it should operate. In its short existence, despite the absence of agreed upon goals and processes, the Group has accomplished a great deal but never as much as some members think needs to be done or in as focused a way as management would have found more valuable. The Group's focus and dedication are often hampered by barriers that make it impossible for them to move the CBDPP in a direction to be more responsive to workers.

BAG-1. Many members believe the Group must monitor the operation of the medical surveillance program and other programs that impact affected workers, calling problems to the attention of those responsible and seeking to correct inadequacies in order to fulfill their commitment to affected workers. They are committed to seeking fixes for the problems brought

to the Group and to its individual members. Through their efforts, they gain a sense, but not a documented record, of problems in the programs. However, absent a process and adequate support and resources, the Group cannot identify, investigate, and document the problems that workers encounter. The concerns they raise, therefore, are thought to be isolated failures of the system rather than indicators of systemic shortcomings.

When the individual problems are fixed yet the complaints continue that there is a problem with the system, the Group and its members are seen by some to be chronic complainers. A need to find lasting solutions rather than quick fixes is not recognized. The resulting frustration and anger when the medical surveillance program and other programs don't respond as some Group members believe they should, despite their efforts to report and advise and despite policies established and promises made, is debilitating and divisive. If the concerns and problems with the various programs for beryllium-exposed workers were resolved, it is likely that much of the conflict among Group members and between the Group and others could be eliminated. Many of the Group's concerns are identified in this report.

BAG-2. Aware of the national program's inclusion of workers and union representatives in program development, the early and most involved beryllium-affected Hanford workers and the contractors sought to have the BAG serve a similar function. The workers sought to have beryllium-affected workers represent the BAG at national DOE meetings on beryllium risk communication and training to share their perspectives and to bring back information presented at the national meetings. One current source of frustration is that they are not represented at national meetings on the CBDPP, and Hanford beryllium-affected workers' concerns and suggestions are not raised by a worker advocate. They feel that information from these meetings is reported back to them by individuals whose viewpoints differ from theirs.

BAG-3. The goals adopted by the BAG give rise to concern over its role and illustrate the gap in expectations between management and workers: Is it an advisory group, a sounding board, or is it involved in implementing the program? The goals quoted below were adopted by the Group. The goals, and some of the conflicting expectations and concerns raised by each one, are:

- "To inform every worker of the hazards of Beryllium, and give them the information they need to make an informed decision on the need for beryllium medical screening."

  - ✓ Some, but not all, BAG members view their role as having direct involvement in training and communication. Some managers want worker feedback but urge that the training and communication (including design of written materials) come from risk communication and training professionals.

  - ✓ Some managers disagree with the goal of reaching out to "every worker" and want to focus these programs solely on beryllium-associated workers.

- "To allow every employee the opportunity to seek medical advice and treatment without fear of retribution."

  - ✓ Having this statement about fear of retribution at the top of every set of BAG minutes is understandably an affront to some in management.

- "Set up a system of doctors, hospitals, and medical program informed in beryllium care for every former and current beryllium worker, to aid in maintaining quality of health."

    ✓ This is a goal of the entire CBDPP, but the BAG's role in "set up" raises conflicting expectations.

BAG-4. The lack of a well-defined scope for the Group, a lack of clear delineation of what is official Group activity, and a lack of clarity about the role of the BeHAs and others from management who attend the meetings of the Group have caused some confusion for management, for beryllium-affected workers, and for their supervisors. Some workers question the role of managers who participate in the BAG beyond serving as resources for the procedural operation of the Group. This lack of clarity has led to distrust and the establishment by the workers of a worker-only "core group." This serves to create more questions and distrust on the part of some managers and supervisors. They observe that significant amounts of work time are being spent on activities that they may see as not beneficial to the site or necessary to fulfill the functions of the BAG agreed to in the charter.

Benefits to the CBDPP, the workers, and the site are not apparent to most site personnel due, again, to the absence of a defined scope of activity. Also due to the lack of definition, the Group has engaged in legislative activities without effective guidance on the legality of communications to affect legislation during work hours and using site resources. Also contributing to the lack of clarity, the site-wide Beryllium Steering Group includes the co-chair of the BAG, but the relationship and interaction between the two organizations is not defined.

In considering appropriate scope, 10 CFR 850 requires that counseling be made available, including communication to affected workers concerning:[75]

- The medical surveillance program
- Medical treatment options
- Medical, psychological, and career counseling
- Medical benefits
- Administrative procedures and rights under Workers' Compensation and similar programs
- Work practices limiting exposure
- Risks of continued exposure after sensitization

This list is a good starting point to help Group members and site management define the appropriate goals and scope for the Group.

BAG-5. Any initiatives to change the activities and responsibilities of the Group will be successful only if the Group participates in defining the new scope of activity. The initiative to begin a separate support group, outside the scope of the Group, has been met with distrust and the perception that managers sought to eliminate all or part of the Group's current function; that is, core group meetings. That distrust was heightened by the proposal to utilize a site psychologist to convene the support group as there would be a conflict of interest due to

his or her primary job duty being the assessment of fitness for work and assessment for security clearances.

At the same time, Group members do identify the need for a support group with medical- or therapist-protected confidentiality. This is an opportunity to build confidence in a new program through the Group's participation in selecting the therapist or medical personnel who would convene the support group, continuing linkage between the Group and the support group. Efforts that fail to involve the Group sufficiently in making choices of this sort contribute to undermining the workers' trust and confidence in management's intentions.[76]

BAG-6. There is a need to develop a new charter with the Group that will enable it to define clear goals, resources, and scope of activity in a document agreed to by the Group, the contractors, and DOE. The new charter should clearly commit DOE-RL and the contractors to provide resources, including access to information and commitments to respond to policy advice at an appropriate level within an appropriate time frame.

An independently facilitated process is needed to achieve a new charter between the contractors and their affected workers, agreed to by DOE, and to launch a support group. Group members are concerned that they do not have the resources or the access to advice to ensure that their needs will be met in the process. They need to have confidence and an equal say in the choice of an independent facilitator.

An independent facilitator should work out ground rules to which all parties subscribe that will ensure the playing field is level. The ground rules must identify who speaks for the Group, for the contractors, and for DOE. For the Group, there must be a feedback process that guarantees opportunities for the entire Group to understand the issues and to offer input.

RECOMMENDATIONS

1. *Reach consensus on the goals and scope of the Group, the processes and structure to be used to accomplish these, and the responsibilities and accountability of those involved. To do this, management should be clear about what it believes should be the role of the Group.* **(See BAG-1, BAG-2, BAG-3, BAG-4, BAG-5)**

2. *Have an independent facilitator, chosen jointly by the Group and management, facilitate the process of agreeing to a new charter with roles, responsibilities and ground rules that the contractors and affected workers can mutually agree upon and that can be approved by DOE-RL. This process would include advising the members on the legal boundaries of their activities.* **(See BAG-6)**

   The charter should:

   2.1. *Describe the scope of activities on which the Group will serve to advise DOE and the contractors. The scope should not include legislative agendas;*

   2.2. *Resolve how the Group will be represented at national forums;*

2.3. Include a process for adoption of any recommendations, including to whom the recommendations are to be made, resources to be provided, and a clear process for response;

2.4. Clarify who will speak for the Group, if anyone, and how the Group will obtain information needed to meet its goals;

2.5. Establish standards for work time to be allocated to Group activities and the process for employees to clear time off with their managers;

2.6. Establish a process to provide updates to the Group about how the CBDPP is working and the opportunity for the Group to have input monitoring it;

2.7. Resolve whether former workers' participation will be encouraged, and if not, why;

2.8. Clarify the roles of the contractor and DOE-RL personnel in providing resources and their participation;

2.9. Reach agreement on whether and, if so, how the Group will advise DOE and the DoL on the implementation of the compensation and medical surveillance program (EEOICP) at Hanford, as it relates to beryllium.

3. Ensure confidentiality among Group members and invited attendees; institute and enforce requirements for confidentiality. **(See BAG-5, PC-1, PC-2)**

3.1. Work with the Group to create a separate support/counseling group for workers and their family members with clear confidentiality, facilitated by a medical person or therapist. Through provisions of the charter, maintain the connection between the Group as anticipated in recommendation #2 and this support/counseling group.

3.2. Ask a medical professional who has the confidence of the workers and is considered qualified by HEHF to initially convene the support group and assist in selecting a permanent therapist who will have the confidence of the workers and HEHF.

4. Improve and institutionalize processes for sharing any and all beryllium-related information with all members of the Group. **(See BAG-2**

APPENDIX A: Ombudsman Job Description

A job description for the ombudsman should include the following specifics:

The person in this position must have adequate independence and authority to motivate those accountable to meet the requirements of the site-wide CBDPP and applicable rules. The qualifications include a strong background in beryllium contamination, workplace illness, occupational medicine, the CBDPP, and site operations.

The ombudsman:

1. provides answers and support to workers in a manner demonstrating sensitivity to the issues of affected workers;

2. shall be required to maintain confidentiality;

3. acts as a resource to managers for questions relating to job actions regarding beryllium-affected workers;

4. refers workers to the best resource available or to the appropriate company office;

5. is able to obtain quick access to qualified medical opinions for referral;

6. is responsible to monitor various aspects of the CBDPP to ensure its continuing effectiveness and responsiveness in accordance with DOE policy;

7. is responsible for ensuring effective implementation of the site-wide CBDPP and the contractors' implementing procedures, with direct access to DOE-RL management for purposes of contractor performance evaluations for fee determinations;

8. is responsible for ensuring that confidentiality of medical information is protected at each stage of the program;

9. works with the compensation program and site personnel to ensure smooth handling of reviews of potential exposure, to resolve disputes, and to ensure that confidential medical information is not abused;

10. has the authority to ensure that appropriate work restrictions and removal requirements are understood by managers and are met;

11. is responsible for the annual evaluation of the CBDPP and the contractors' implementing procedures, and has input to the fee evaluations.

Appendix B: Matrix

The recommendations from the report are excerpted on the following pages. The Council provides this tool to assist those seeking to identify next steps.

For each recommendation the driver has been identified as **R**, the Rule, 10 CFR 850; **P**, added protection for workers; **H**, human considerations, such as reducing stress, building confidence in the programs, creating transparency, providing opportunities for input, making the programs more accessible to the workers.

For each recommendation the party with primary responsibility is identified, to the best of the Council's knowledge and understanding: **DOE, HEHF, CONT** (the contractors).

#	Recommendation	Driver	Primary Responsibility
Workers' Introduction to the CBDPP (WI)			
1	*Establish and staff a program to develop a risk communication program based on state-of-the-art professional expertise in epidemiology and industrial hygiene data. The program should include attention to the following:* **(See WI-4)**	R	DOE
	1.1 Prioritize lists of workers based on level of risk, as evaluated from their work history and epidemiological data.	P	DOE
	1.2 Send new individualized risk communication letters through the U.S. mail, urging testing, explaining the benefits of testing, and offering assistance, as well as informing them of the EEOICP Act. Send the letters at the same time to reach employees who worked together and timed to produce a steady rate of response rather than an unmanageable surge.	P	CONT
	1.3 Confer with medical experts, communications experts, and representatives of the BAG in designing and implementing the program.	H	CONT, DOE
	1.4 Continue to cast the net widely, informing workers of the information set forth in WI-6. The goal should be to develop the best information and to present it effectively to enable workers to make an informed decision about being tested.	P	DOE (CONT & HEHF)
2	*Ensure pre-1987 work histories are requested and used, as well as more recent records and information from other sources, such as CRESP, where appropriate, for risk assessment. Integrate with questionnaire results to track potential areas and time of exposure. Use sensitized former workers' work histories as well as current workers'. Utilize this information to individualize and prioritize:* **(See WI-4, WI-5, BT-2)**	R	DOE (with CONTRC & HEHF)
	2.1 Risk communication on benefits of testing	P	HEHF
	2.2 Training	R	CONT
	2.3 Sampling	R	CONT
	2.4 Posting	R	CONT
	2.5 Communication to sensitized workers regarding avoidance of potential additional exposures and regarding work restrictions	R	HEHF (CONT & DOE)
	2.6 Facility rankings regarding likelihood of exposure based on actual common work histories of beryllium-affected employees.	R	DOE
3	*Continue to identify specific workers who have been placed at risk as a result of facilities where they have worked, including storage and disposal locations, and D&D workers.* **(See WI-4, WI-5, WI-6)**	R	CONT

#	Recommendation	Driver	Primary Responsibility
4	*Eliminate barriers and ensure informed participation in the initial testing program with the goal of testing workers at significant risk, and any others who want to be tested. Encourage testing of employees for sensitization.* **(See WI-2, WI-3, WI-5, BT-1, MS-1)**	P	HEHF
5	*Schedule confidential interviews for workers who are interested in exploring the option of being tested; provide the best medical information available.* **(See WI-2, BT-1, MS-1, PC-1)** *Review training materials and risk communication materials to include more complete information on the hazards associated with exposure to beryllium and an emphasis on the link between work in beryllium facilities and beryllium sensitization or CBD. Link the training programs to the workers' signing up for the LPT.* **(See WI-3)**	H R	HEHF CONT
6	*Establish specific training for beryllium-sensitized workers including information regarding:* **(See WI-1, PAE-4, PAE-5, PAE-6)** *6.1 The differences between various regulatory levels for exposure;* *6.2 The potential for harmful exposure at levels below the regulatory levels, particularly in the case of sensitized workers;* *6.3 The need to seek and obtain specific information about how the monitoring data were and are collected;* *6.4 How to access monitoring results and how to compare them to various standards.*	P P	CONT CONT
7	*Provide managers with training necessary to ensure that health and rights are protected and to prevent actual or perceived discrimination against beryllium-affected workers who have work restrictions. This training must emphasize that managers cannot adversely judge a worker's performance due to reduced productivity when this is based on absence due to occupational illness or conformance to a work restriction. Have a standard training module and resource available on the website. Ensure that it is understood that stop work authority extends to a sensitized or CBD-diagnosed worker declining to work in an area with a potential exposure to beryllium, even if the level is below the regulatory action level.* **(See WI-7, PC-3)**	R, P, H	CONT
8	*Ensure access by workers to the ombudsman (described in recommendation #8 of MS and the Appendix) to resolve communication problems or disputes as to performance evaluations where there is a concern over whether a job action was discriminatory, to seek to avoid escalation to formal processes.* **(See WI-7)**	P, H	DOE
Barriers to Being Tested (BT)			
1	*Once the worker has decided to be tested, take blood samples for the tests and ask him or her to take home a questionnaire to be completed for the next visit where the test results will be reviewed.* **(See BT-1)**	H	HEHF
2	*The questionnaire could be similar to the extensive one initially used in the program and designed to provide epidemiological data. However, the focus of the questionnaire must be on identifying work locations; unnecessary questions that might discourage the worker from completing and returning the questionnaire should not be included. In providing information for epidemiological purposes, the program must ensure that the worker's identity is not connected to the data in order to maintain confidentiality.* **(See BT-2, BT-3, WI-4, WI-5, PC-1)**	R	HEHF
3	*Work history, including assignments or time spent in potential suspect beryllium facilities/areas, which are not likely to be in official work records, should be gathered and utilized for epidemiology. Work histories that have been gathered for EEOICPA claims should,*	R	HEHF

#	Recommendation	Driver	Primary Responsibility
	with the workers' consent, be utilized for epidemiology. All workers who have already had a positive or borderline LPT or have been diagnosed with CBD should be requested to complete the new, more extensive questionnaire. Workers should be notified that this information might also be crucial to them for compensation/surveillance programs under the EEOICP Act. **(See BT-2, WI-4, WI-5, PAE-1)**		
4	*Evaluate the risk ranking used to identify facilities based on epidemiology and time periods where workers would have been placed at risk for beryllium exposure. Have the HEHF epidemiologist work closely with the DOE-HQ epidemiologist to apply findings from the larger population of beryllium-exposed workers to Hanford and to assist with identifying high-risk workers who may not be in the surveillance program. Gather and use epidemiological data in this effort. Suggest that workers provide authorization to start the process of gathering their work histories and using them for epidemiology, rather than waiting until they submit their claims under the EEOICPA and receive requests for information from DoL. Work with the BAG and external experts.* **(See BT-2, WI-4, WI-5)**	R	DOE with HEHF
The Medical Surveillance Program (MS)			
1	*In order to achieve a major focus on consistency and to ensure confidentiality, sensitivity, timeliness, and accuracy in providing information to workers and their families, in arranging appointments for tests, in conducting medical reviews, in making referrals, in providing information to managers, in supplying information for the consistent application of company policies and procedures, and in supporting the worker as needed, establish a "case management team" (CMT) at HEHF for beryllium cases. The purpose of the case management team, comprised of medical personnel, a manager, and a "patient health advocate," would be to address diagnostic issues, accommodation, recommended surveillance, environmental assessment issues, medical referrals and follow-up, logistics for testing, compensation, and communication issues. The patient health advocate should be a health professional (an R.N.) dedicated to patient support, replacing the role of the individual companies' BeHAs.* ***(See MS-1, MS-2, MS-3, MS-4, MS-13, WI-2, MI-1, PC-1, PC-3)***	H,P	HEHF
	1.1 Discontinue the position of BeHA and replace it with an HEHF single contact (the patient health advocate), responsive to the CMT, and with a DOE-RL-based ombudsman.	H	DOE (CONT, HEHF)
	1.2 Hold regular meetings of the CMT and keep complete and accurate meeting minutes, with due regard for confidentiality, in order to improve communications, to resolve conflicting views and diagnoses, to provide for more consistent and clear case information and progress reports, and to reduce inconsistencies and misunderstandings among HEHF staff and between HEHF staff and affected employees.	H, P	HEHF
	1.3 Provide the best available medical information from the time of the pre-test interview throughout the time the worker is connected to the program. Ensure that the information communicated to the workers has been fully vetted by the CMT.	H	HEHF
	1.4 Ensure that medically advised surveillance, documentation, or diagnostic activity (including photographic documentation of a physical condition), are performed without interference.	R	HEHF
	1.5 Provide a full and accurate briefing to the workers on their condition when the information is available, and provide a	R	HEHF

#	Recommendation	Driver	Primary Responsibility
	channel for employees and family members to ask and have answered further questions. Provide access to resources for counseling and other assistance to the employees and their families.		
	1.6 Provide oversight, as a function of the patient health advocate, of all matters having to do with the medical testing and reporting; e.g., tests scheduling, document referral and reporting, and travel arrangements. Establish and meet standards for moving people to and from each stage starting with initial testing, getting results, and next steps.	H	HEHF
	1.7 Provide linkage, as a function of the patient health advocate, to the epidemiology program and the industrial hygiene program to provide information and reassurance to the individual worker that the personal data that are volunteered and collected help inform what is done on the site in relation to beryllium programs. Transparency in this connection will help workers understand what is happening and how important it is.	H	HEHF
	1.8 Ensure that there is sufficient administrative support provided to the functions assigned to the CMT, being particularly aware of the many duties assigned to the patient health advocate and the need for the person in the position to be sensitive and responsive to the concerns of the patients.	H	HEHF
2	*Establish, standardize, and oversee procedures to inform managers in a timely manner, as a function of the patient health advocate; support the relationship between the workers and managers without violating confidentiality restrictions and provide affected employees and their managers with consistent, non-contradictory information.* **(See MS-1, MS-12, MS-13, WI-7, PC-1, PC-3)**	P	DOE (CONT, HEHF)
	2.1 Provide managers with the knowledge and understanding needed to interact appropriately with workers identified as beryllium-affected. For example, managers should be aware of the confidentiality requirement and the need to conform to the work restrictions.	R	CONT
	2.2 Meet with managers and workers to review work restrictions and make them easily understandable and not open-ended or unnecessarily restrictive.	P	HEHF, CONT
	2.3 Provide managers with information about time-coding policies for approved beryllium activities and medical testing.	P, H	CONT
	2.4 Notify managers in a timely manner about appointments, testing, travel schedules, and other matters that are necessary for the worker's supervisor to know.	P,H	HEHF, CONT
	2.5 Following one positive or borderline positive LPT blood test, offer workers temporary work restrictions to reduce/eliminate potential exposures to beryllium. Do not wait for second or third tests to offer preventive action. Provide full information about the meaning of the tests, the numeric chances of its being a false positive, the differing medical opinions, and the obligation of the employer to find alternative work or provide for medical removal benefits. Enable the worker to make an informed decision.	R	HEHF

#	Recommendation	Driver	Primary Responsibility
	2.6 Ensure sensitized (including after one positive or borderline test) workers and their managers know how to access facility sampling data and history to implement restrictions/removal to prevent exposures. Provide managers with training on accommodation of beryllium-affected workers.	P	CONT
	2.7 Give managers the opportunity to ask questions of the patient health advocate and give them phone numbers and access to a web-site-based resource to have further questions answered.	P,H	HEHF, CONT
3	*HEHF should resolve differences in medical diagnoses or test result interpretations, utilizing the case management team and a formal process, which is communicated to employees.* **(See MS-2, MI-2)**	R	HEHF
	3.1 Ensure workers understand their rights to second and third medical opinions, and to a resolution process, as provided under 10 CFR 850.	R	HEHF, CONT
	3.2 Provide a clear process to obtain additional medical opinions, and a process utilizing the CMT to resolve differences of opinion. Ensure workers are aware of the ombudsman's availability. (See recommendation #8)	R PreOmbud	HEHF, CONT DOE re Ombud
	3.3 Ensure that workers understand that medical uncertainty and lack of consensus among medical doctors is a result of the limited amount and particular focus of scientific research that has been done. Medical doctors are limited by the scientific findings.	H	HEHF
4	*Guarantee confidentiality in all parts, aspects, and levels of the medical surveillance program. Establish requirements for confidentiality and enforce them vigorously. Limit the number of HEHF and other personnel who have access to confidential material and require documentation when files are accessed. Strictly preclude non-medical personnel from having unauthorized knowledge of individual medical information.* **(See BT-3, PC-1, PC-3)**	R	DOE (HEHF)
5	*Guarantee timely reimbursement of funds and personal time taken from individual accounts, such as Personal Time Banks, sick leave, or vacation, for beryllium-related approved medical activities.* **(See MS-1, MS-12, MS-13)**	H	CONT
	5.1 Ensure that workers entering the screening process and proceeding through the testing program do not have to use personal leave time.	H	CONT
	5.2 Adopt a policy and process to restore personal leave time retroactively to those workers who submit requests along with records of time used for the screening and testing program since its inception.	H	CONT
	5.3 Adopt a policy and process to restore personal leave time retroactively to those workers currently diagnosed as beryllium-affected who submit requests with records of personal time used for beryllium-related absences since the inception of the program.	H	CONT

#	Recommendation	Driver	Primary Responsibility
	5.4 Establish policies so workers, when diagnosed with CBD, will have timely restoration of any personal leave time used for previous absences resulting from their beryllium exposure.	H	CONT
	5.5 Ensure that workers diagnosed with CBD have access to plant injury (PI) and/or short-term disability leave so that they can work partial weeks or days in order to accommodate their physical limitations.	H	CONT
	5.6 Ensure that employees receive timely reimbursement of any personal funds or consumer credit used for allowable travel expenses when proceeding through the testing process.	H	CONT
	5.7 Conduct a site-wide review of criteria for eligibility for PI time, sick leave, disability leave, Workers' Compensation, and other benefits to make them consistent for all beryllium-affected workers.	H	DOE
6	*Continue to provide access to NJMC and the UW for diagnostic testing, and utilize those diagnoses for eligibility for Workers' Compensation and CBD-related PI time.* **(See MS-3, MS-4, MS-5, MS-6, MS-7, MS-12)**	H	HEHF
	6.1 HEHF should provide referrals or access to a "personal attending physician" with expertise in beryllium-related illnesses for diagnosis and treatment.	H	HEHF
	6.2 The third-party-administered Workers' Compensation program should provide written notice that even in the absence of positive LPT results, a diagnosis of CBD by a qualified medical doctor is sufficient to meet the eligibility criteria for coverage.	R, P	DOE
	6.3 DOE and DoL should recognize a diagnosis of CBD by a qualified medical doctor as sufficient for purposes of the new compensation and medical surveillance program (EEOICP). The rule governing EEOICP should be changed if necessary.	H	DOE
	6.4 When there are qualified medical diagnoses of illnesses, or that symptoms and conditions are caused by, or their severity is increased by, occupational exposure, these diagnoses should be used to report occupational illness and the reported occupational illness should be recognized as eligible for Workers' Compensation.	R	DOE
	6.5 Standardization of the criteria for recognition of symptoms and conditions as having beryllium-exposure causation (e.g., skin lesions) should occur under the leadership of DOE. To decrease the site-to-site variability in eligibility and diagnosis, periodic national conferences should be convened with DOE support to develop consensus for diagnoses of CBD and related illnesses, beryllium-exposure causation, and sensitization.	P	DOE
	6.6 Informational seminars should be provided to the BAG on requirements for eligibility for Workers' Compensation Programs.	H	DOE

#	Recommendation	Driver	Primary Responsibility
7	*The EEOICP Act compensation system should provide for the flexibility to recognize individual diagnoses that do not meet the standard criteria. In particular, the program should not have positive LPT results as an absolute requirement, but rather should seek to review a full clinical history, in which LPT results are one of several important tools. This is more important if the criteria for a positive LPT result do not recognize the areas now considered "borderline," or do not recognize the potential for LPT results to be masked or to change over relatively short periods of time.* **(See MS-5, MS-6, MS-8, MS-12)**	H	DOE
8	*Provide workers with convenient and comfortable access to an ombudsman, located at DOE-RL, replacing one role previously given to each company's separate BeHA and adding an assessment/evaluation function. This ombudsman should have the authority to assist employees and to ensure that CBDPP policies and expectations are met. The person would be able to answer beryllium-affected workers' questions and give them timely support before referring and delegating to those responsible for the matter being raised. The ombudsman would be ultimately accountable for putting the workers in touch with the right resources and making certain that the resource person provides the support or answers to which the workers are entitled. (Reference: Ombudsman Job Description in the Appendix)* **(See MS-1, MS-2, MS-7, MS-11, MS-12, MS-13, WI-7, MI-3, PC-1, PC-2)**	P, H	DOE
	8.1 Inform workers that the ombudsman is available to assist in ensuring that time commitments for medical surveillance are reasonable and are met. The primary responsibility for ensuring that time commitments for medical testing and diagnoses are reasonable and are met will lie with the CMT patient health advocate.	H	DOE
	8.2 Inform workers that the ombudsman is available to assist in ensuring that: concerns about timely processing of Workers' Compensation claims are resolved and the details of the claims processes, including the appeals process, are understood; and concerns about medical removal protection benefits under 10 CFR 850.35 are resolved.	H	DOE
9	*Place workers who are on long-term disability leave into the former worker programs or maintain them in the on-site current worker medical surveillance program. Fully inform beryllium-affected workers, both those who are currently being identified and those who were identified previously, of their medical removal options and medical removal protection benefits, including provision for their continued participation in the site beryllium medical surveillance program. Offer each beryllium-affected worker medical removal to the extent it is consistent with the new standard work restrictions, and inform him/her of the protection benefits. Contact beryllium-affected workers who were laid off or moved to long-term disability leave after diagnosis, inform them of the protection benefits, and offer them continued participation in the site medical surveillance program.* **(See MS-9, MS-11, MI-2, MI-3)**	H, R	DOE, CONT
10	*DOE should establish a national policy to ensure that all beryllium-associated and beryllium-affected workers receive seamless, long-term continuity of access to medical surveillance and medical services after leaving DOE or DOE-contractor employment.* **(See MS-9)**	H	DOE
11	*Review the new, more restrictive standard for a positive reading on the LPT indicating beryllium sensitization and determine whether it is an appropriate standard for medical screening and risk reduction or overly exclusive for purposes of determining work restrictions for the employee to avoid additional exposures to beryllium. Utilize external advisers.* **(See MS-8)**	P	HEHF
12	*Establish worker-friendly hours for the new DoL/DOE compensation claims office. Also, establish a policy for Hanford site workers to account for their time used to visit the office during work hours.* **(See MS-10)**	H	DOE

#	Recommendation	Driver	Primary Responsibility
Medical Issues (MI)			
1	*Provide access to individual consultation on medical issues from medical personnel who are knowledgeable about the health effects of beryllium.* **(See MI-1, MI-3, MS-2, MS-3, MS-4, MS-8, MS-12, PAE-3, PAE-4)**	H	HEHF
	1.1 Provide workers with confidential access to a doctor, in whom the workers have confidence and who is a member of the CMT. Authorize this doctor to serve as the workers' attending physician for purposes of providing documentation to CCSI for intermittent absences from work for causes related to beryllium exposure; for example, to provide an opportunity for workers to obtain a medical opinion regarding whether illnesses for which the worker saw a local physician were related to beryllium exposure.	H	HEHF
	1.2 Contract with doctors from NJMC and/or the UW to come to the site for monthly information meetings and individual and private physician consultations.	H	HEHF
	1.3 Provide for a beryllium-expert doctor to be available for consulting with doctors in the community who are called upon to treat beryllium-affected workers.	H	HEHF
2	*Provide information and assistance to doctors who are asked to treat beryllium-affected workers for beryllium-related diseases and illnesses to encourage them to participate in the Workers' Compensation program. This may require recognition of beryllium-related illnesses other than pulmonary illness.* **(See MI-1, MS-3, MS-4, MS-5, MS-6)**	H	HEHF
3	*Provide access to individual consultation about employment compensation issues that are affected by the medical status of the affected worker; e.g., Workers' Compensation, short-term and long-term disability leave, paid time off for beryllium-related medical absences. Coordination between medical providers and program gatekeepers should be expedited.* **See MI-1, MI-2, MI-3, MS-4, MS-5, MS-6, MS-7, MS-11)**	H	CONT
4	*Review and revise work restriction policies and procedures.* **(See MI-2, MI-3, MS-2, WI-7, PAE-1, PAE-2, PAE-4, PAE-5, PAE-6)**	P	DOE
	4.1 Ensure work restrictions are binding on the workplace.	P	DOE
	4.2 Update the work restrictions of all beryllium-affected workers.	P	HEHF
	4.3 Offer temporary work restrictions immediately upon receipt of a positive or borderline LPT result in order to prevent potential exposure to beryllium.	R	HEHF
	4.4 Recognize medical work restrictions and removal recommendations from outside medical experts or, in the absence of such recognition, provide for speedy resolution by the CMT of any disagreement on work restrictions or removal recommendations.	P	HEHF

#	Recommendation	Driver	Primary Responsibility
	4.5 Make it easier and more practical for workers and management to meet work restrictions through better compliance with the requirements of the Rule for posting and notification of monitoring results.	R	CONT
	4.6 Offer full removal from a facility where an exposure may have occurred when medically advised that a worker should avoid all potential exposure and provide alternative work placement.	R	CONT
	4.7 Consult with the unions and the BAG about the processes to use in the reassignment of workers to ensure consideration of the workers' preferences and contractual protections.	H	CONT
5	*DOE-HQ management should identify beryllium-affected workers who have left employment on the sites through layoff or long-term disability leave without having the provisions of the medical removal and medical removal protection benefits explained to them, and should determine in each case whether their employer should: (a) find them an equivalent position (free from beryllium exposure) for which they are qualified or may become qualified with a short period of training; (b) retroactively provide up to two years of medical removal protection benefits, including salary and medical benefits (including beryllium program benefits).* **(See MI-3, MS-9, MS-11)**	R	DOE
6	*DOE-RL should ensure that each beryllium-affected worker, including those who have left employment or taken long-term disability leave after being diagnosed, is informed in writing of the medical removal options and medical removal protection benefits under 10 CFR 850.35. Workers who have taken long-term disability leave after receiving positive LPTs or being diagnosed with CBD should receive medical surveillance, testing and treatment (including counseling) for at least two years. DOE-RL and the contractors should consider what benefits should be provided after the minimum two-year period.* **(See MI-3, MS-9, MS-11)**	R	DOE
	6-1 Consult with the BAG to create a program to offer each worker medical removal, pursuant to the new standard work restriction, with training or a job transfer to positions of equal salary and benefits; or, provide full salary (including overtime expectation) and benefits for up to two years (or until such a position becomes available), pursuant to 10 CFR 850.35. Provide access to the site beryllium programs, including testing and counseling.	R	CONT
Preventing Additional Exposures to Beryllium (PAE)			
1	*Use of beryllium-contaminated buildings when not necessary to the work housed in them should be discontinued. A survey of work activities housed in each beryllium-contaminated facility should be conducted as soon as possible. Workers should be moved out of such facilities, particularly when there are a number of sensitized workers housed in them. This would reduce potential for exposure to the maintenance staff as well as to the primary staff housed in these facilities.* **(See PAE-1, MI-2)**	P	CONT
	1.1 A controlled program should be used to test vacuum dust from non-beryllium work areas in buildings with beryllium contamination, as an aid to assuring that the level of beryllium in dust does not exceed the level identified in work restrictions.	P	CONT

#	Recommendation	Driver	Primary Responsibility
2	*The Hanford site and contractor CBDPP documents should specify a maximum allowable removable surface contamination level for beryllium in non-regulated areas. It is recommended that the current regulatory criteria of 0.2 μg/100cm² for beryllium-contaminated equipment released to the public or to non-regulated areas be considered for adoption as the standard and applied to non-regulated areas in Hanford facilities.* **(See PAE-2, PAE-6, PAE-9)**	P	DOE
	2.1 DOE-RL should adopt site-wide standards and a manual for beryllium sampling, monitoring, and exposure reduction.	P	DOE
	2.2 DOE-RL should use external experts to assess the adequacy of the site contractors' beryllium sampling, monitoring, and exposure reduction programs to ensure consistency with DOE implementation guidelines and other practice standards.	P	DOE
3	*Reasonable accommodation to sensitized workers must assure they are not housed in facilities where there is a potential for additional exposure to beryllium.* **(See PAE-1, PAE-2, PAE-5, PAE-6, WI-7, MI-2, MI-3)**	P	CONT
	3.1 Relocating a sensitized worker away from a beryllium-suspect facility, physically separating their office from others in the group, and holding staff meetings in the facility that has the potential for additional exposure to beryllium, is not a sufficient or reasonable accommodation.	P	CONT
4	*The beryllium-suspect facilities list should be reviewed and updated. The category titles should be modified to reflect the potential for exposure. Facilities with removable surface contamination above the standard for release criteria in 10 CFR 850.31 should be specifically and prominently noted. Updates to the list should occur routinely.* **(See PAE-1, PAE-2, PAE-4, PAE-5, PAE-6, PAE-8)**	P	DOE
	4.1 Monitoring results for surface and airborne levels of beryllium should be posted at facilities and on the website linked to the beryllium-suspect list, to enable affected workers to avoid potential exposure. Monitoring results, including notice of the MDL used, should be a part of work package planning and communication, with accommodation offered sensitized workers to meet their work restrictions.	R	CONT
5	*Facilities on the beryllium-suspect facilities list that were surveyed for removable surface beryllium using an MDL of 0.5 μg/100cm² should be considered as and listed as having the potential for beryllium exposure. Until a detailed review of the facility has been performed, or sufficient sampling data have been collected to document non-exposure, all work being performed in these facilities should be evaluated to determine the potential for beryllium exposure.* **(See PAE-2)**	P	CONT
	5.1 Opinions differ on whether these facilities should be subject to new surveying using an MDL capable of detecting 0.2 μg/100cm², giving priority to facilities accessed by beryllium-sensitized workers and to buildings where D&D or other work that may disturb surface contamination is planned, or whether it is sufficient to review existing sampling data that were collected using the MDL of 0.5 μg/100cm².	P	CONT
	5.2 There is agreement that any new sampling should use an MDL of 0.01 μg/m³ for airborne beryllium and an MDL capable of detecting 0.2 μg/100cm² for surface contamination. In addition, any equipment removed from an area with potential beryllium contamination should be sampled to verify that the surface contamination is below 0.2 μg/100cm².	P	CONT

#	Recommendation	Driver	Primary Responsibility
6	*The policy issues raised at PAE-2 merit thorough review by the responsible parties and attention by DOE in order to develop site-wide policies. During the interim, in the interest of timely attention to worker health and safety, contractors should consider adopting policies applicable to their own operations.* **(PAE-2)**	P	DOE, CONT
7	*Personal air space monitoring, surface sampling of the areas around their normal workspace, and respiratory protection should be specifically offered to all beryllium-sensitized or CBD-diagnosed workers along with information to enable them to make an informed decision. At minimum, this would provide assurance that their sensitization was not caused by, or risk being exacerbated by, any unidentified exposure during the course of their normal workday. Personal air monitoring also provides a far more accurate assessment of exposures.* **(See PAE-3, MI-2)**	P	CONT
8	*Specific training should be established for beryllium-affected workers including information regarding the differences between various regulatory levels for exposure (e.g., the difference between the Permissible Exposure Limit, and the "action level"); the potential for harmful exposure at levels below the regulatory levels, particularly in the case of sensitized workers; and how to access and compare monitoring results to various standards.* **(See PAE-1, PAE-2, PAE-4, PAE-5, PAE-8, WI-1, MI-2)** *8.1 Beryllium-sensitized and CBD-diagnosed workers should be informed that prior postings or statements that levels of removable beryllium (dust) were non-detectable were based on a lab analysis method with a detection limit that was two and a half times higher than the permissible level for removable beryllium contamination on equipment or items to be released for use outside of a regulated area.*	P P	CONT DOE
9	*Work restrictions or medical removal should be expressed both as a numerical exposure level and as restrictions against working in facilities in the various categories on the beryllium-suspect facilities list. The Automated Job Hazard Analysis used for work package planning is an easily accessed and understandable tool, which is already linked to the suspect facilities list. This allows a worker the opportunity to decline work in a suspect facility. If the work restrictions stated no work in facilities on the list, or in some categories of listed facilities, then the restriction would be easy to follow, and the worker would not face pressure to perform a task in a location where he/she might be exposed to beryllium.* **(See PAE-4, PAE-5, PAE-6, MI-2, MI-3)**	P	HEHF
10	*Goals should be set for reducing exposures in or around facilities where sampling shows airborne beryllium levels below the regulatory action limit, but where there is removable surface contamination present, if the facilities are to be used.* **(See PAE-2)**	R	CONT
11	*Workers engaged in D&D or demolition of any beryllium-suspect facilities should be treated as beryllium-associated workers and monitored as part of the medical surveillance program. Appropriate controls for preventing exposure to beryllium are needed in these facilities before demolition and removal of debris.* **(See PAE-6, WI-1)** *11.1 Provide training for beryllium risks and handling to all employees working in D&D or demolition of buildings where beryllium has been stored or utilized, including all work involving ductwork. This training should include risk communication and testing for sensitization for all contractors.*	P P	CONT CONT

#	Recommendation	Driver	Primary Responsibility
12	*Other agencies such as the U. S. Environmental Protection Agency and the State of Washington Department of Ecology with jurisdiction over releases or potential releases from facilities within the boundaries of a Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Superfund site, Model Toxic Control Act (MTCA) site or Resource Conservation and Recovery Act of 1976 (RCRA) Treatment, Storage, and Disposal unit must be informed that there are potential beryllium residues in facilities prior to undertaking D&D work, demolition or approval of risk assessments and work plans. On-site inspection staffs of regulatory agencies should be offered LPTs and provided with notice of beryllium monitoring results and hazards.*	P, R	DOE
	Beryllium wastes should be identified for toxicity, reported and properly disposed with adequate controls. DOE should review with the Department of Ecology and the Environmental Protection Agency whether beryllium tools that may have met the definition of beryllium-contaminated material have been disposed in the unlined soil trenches of the Low Level Burial Grounds and report if any beryllium wastes have been disposed without characterization. Information about the process and access to the report should be provided to workers. **(See PAE-7)**	P, R	DOE
Protecting Confidentiality (PC)			
1	*HEHF, other contractors, and individuals working with beryllium-affected workers and the BAG should, in a coordinated way, review their policies and safeguards on confidentiality of medical information and ensure that all who are in a position of handling such information are aware of their responsibilities.* **(See PC-1, PC-2, PC-3)**	H, R	HEHF
2	*Where it is determined to be necessary to share medical information, the need must be reviewed with the worker and written permission obtained.* **(See PC-1, PC-3)**	H, R	HEHF
The Beryllium Awareness Group (BAG)			
1	*Reach consensus on the goals and scope of the Group, the processes and structure to be used to accomplish these, and the responsibilities and accountability of those involved. To do this, management should be clear about what it believes should be the role of the Group.* **(See BAG-1, BAG-2, BAG-3, BAG-4, BAG-5)**	H	DOE, CONT
2	*Have an independent facilitator, chosen jointly by the Group and management, facilitate the process of agreeing to a new charter with roles, responsibilities and ground rules that the contractors and affected workers can mutually agree upon and that can be approved by DOE-RL. This process would include advising the members on the legal boundaries of their activities.* **(See BAG-6)**	H	DOE, CONT
	The charter should:		
	2.1 Describe the scope of activities on which the Group will serve to advise DOE and the contractors. The scope should not include legislative agendas;	H	DOE, CONT
	2.2 Resolve how the Group will be represented at national forums;	H	DOE, CONT
	2.3 Include a process for adoption of any recommendations, including to whom the recommendations are to be made, resources to be provided, and a clear process for response;	H	DOE, CONT

#	Recommendation	Driver	Primary Responsibility
	2.4 Clarify who will speak for the Group, if anyone, and how the Group will obtain information needed to meet its goals;	H	DOE, CONT
	2.5 Establish standards for work time to be allocated to Group activities and the process for employees to clear time off with their managers;	H	DOE, CONT
	2.6 Establish a process to provide updates to the Group about how the CBDPP is working and the opportunity for the Group to have input monitoring it;	H	DOE, CONT
	2.7 Resolve whether former workers' participation will be encouraged, and if not, why;	H	DOE, CONT
	2.8 Clarify the roles of the contractor and DOE-RL personnel in providing resources and their participation;	H	DOE, CONT
	2.9 Reach agreement on whether and, if so, how the Group will advise DOE and the DoL on the implementation of the compensation and medical surveillance program (EEOICP) at Hanford, as it relates to beryllium.	H	DOE, CONT
3	*Ensure confidentiality among Group members and invited attendees; institute and enforce requirements for confidentiality.* **(See BAG-5, PC-1, PC-2)**	H, R	HEHF, CONT
	3.1 Work with the Group to create a separate support/counseling group for workers and their family members with clear confidentiality, facilitated by a medical person or therapist. Through provisions of the charter, maintain the connection between the Group as anticipated in recommendation #2 and this support/counseling group.	H,R	HEHF
	3.2 Ask a medical professional who has the confidence of the workers and is considered qualified by HEHF to initially convene the support group and assist in selecting a permanent therapist who will have the confidence of the workers and HEHF.	H	HEHF
4	*Improve and institutionalize processes for sharing any and all beryllium-related information with all members of the Group.* **(See BAG-2)**	H	HEHF, CONT

Endnotes

[1] 10 CFR 850 Chronic Beryllium Disease Prevention Program; Final Rule adopted December 8, 1999.
[2] 64 FR 68853; December 8, 1999.
[3] Beryllium-associated workers are any workers whose work potentially exposes them to airborne concentrations of beryllium above the action level; and, sensitized workers or workers with CBD. See 10 CFR 850.3
[4] RL Contractor "Chronic Beryllium Disease Prevention Program," Rev. 1.
[5] Fluor Hanford's policy, applicable to facilities under its management, could be the first step in a site-wide policy, as recommended in recommendation #2 of the PAE section. Site-wide policy would provide for consistency, including in instances when facilities come under new management. Many of the beryllium-suspect facilities now covered by Fluor Hanford's policy will come under the management of the new contractor for the River Corridor later this year.
[6] Section 850.25 "reflect(s) DOE's goal of achieving aggressive reduction and minimization of worker exposures..." The Hanford site CBDPPs do not currently reflect this goal and do not describe such steps, particularly for reduction of potential exposure to surface contamination that may become airborne. "Where levels are below the action level, section 850.25(b)(2) requires responsible employers to include in their CBDPP a description and rationale for the steps they plan to take to reduce and minimize exposures, if such steps are practicable." 64 FR235 at 68878.
[7] HEHF notes, "...the goals for the education program are clear and comply with 10 CFR 850.37. See 'Hanford CBD Prevention Program' [Rev.2 April 26, 2001] p. 11-12 (Section 5.6)," and "... the details of the training program are to be prepared by the contractors...." Brackets added.
The Council notes that 10 CFR 850.37 sets forth the requirements for counseling and training, but not the goals for an education program as discussed in this report.
[8] HEHF notes, "...the processes in place encourage employees to be tested.... To say that employees are being discouraged from testing is a misrepresentation of the situation and fails to acknowledge that the testing process is a voluntary one, in accordance with federal regulations."
The Council notes that some workers report that they have felt that they were discouraged from being tested. Further, in an interview with HEHF personnel it was confirmed that the questionnaire appeared to discourage some workers from being tested since workers could not be scheduled for an LPT prior to completing the questionnaire. In another discussion, reviewing an early summary of this report in the summer of 2001, HEHF personnel concurred that it would be a good idea to give the test prior to asking for the questionnaire to be completed in order to address this problem. See also endnote 17 below.
[9] For example, the training material uses United States Geological Survey information that is general in nature, stresses economic uses of beryllium, and is not intended for communicating information about risk. Materials that are better suited for risk communication include MSDSs and information developed specifically for DOE and DOE-contractor employees who are beryllium-affected.
[10] HEHF directs attention to "...'Beryllium Program Enrollment Processes,' [Effective: 1/8/02 Supersedes: 8/15/01] which shows several forms of individual communication, including 'Enrollment by Request,' 'Enrollment by Questionnaire Received,' 'Enrollment by DOE Historic Health Exposure Questionnaire,' 'Employer Identified Current and Previous Be Workers,' and 'Enrollment by Submitting Names of Previous Be Workers,' each of which ..."results in an

information packet being sent to the worker." "...also see 'Hanford Employee Questionnaire,' [no date] which was specifically designed to locate those Hanford employees who may have been exposed to beryllium and give them the opportunity to enter the beryllium monitoring program." Brackets added.

The Council notes that the materials referenced by HEHF provide opportunity for workers to be sent and to complete questionnaires through self-identification and informal identification of others. There is not a process, using epidemiology and industrial hygiene data, for identifying those workers who are at higher risk and to communicate that information to them individually. In a meeting to review an early summary of this report in the summer of 2001, HEHF personnel described the process for workers to enter the medical surveillance program as primarily self-identification and stated further that the problem with risk communication efforts was funding.

[11] "NJMRC researchers have found cases of CBD among those who had been exposed for periods as short as one month and those who had unrecognized or seemingly trivial exposure." 64 FR 68860.

[12] Environmental Health Perspectives, Volume 102, Number 6-7, June-July 1994. Quoting Lee Newman, MD, MA, Head of the Division of Environmental and Occupational Health Sciences at NJMC, "Newman points out that even with careful ventilatory controls and monitoring, CBD continues to occur because it is due to a hypersensitivity to beryllium.... 'Such hypersensitivity can develop in some individuals following even low-level exposures well within permissible exposure limits,' Newman explains."

[13] In one instance, discrimination was found, but the worker's concern has since been resolved. In another, an investigation did not verify the allegation of discrimination. In another, the personnel action that had been initiated against the worker was halted before final action was taken.

[14] Attachment 1 to HFID 440.1, Sec. 5.4.

[15] Note: A respiratory symptoms questionnaire is required to be part of the exam. However, completion prior to being scheduled for an exam is not required. An HEHF representative told the BAG on October 4, 2000, that the questionnaire was legally required before an LPT could be administered (see BAG minutes October 4, 2000). This was not the only instance of such representations.

[16] Interview with HEHF personnel.

[17] HEHF notes that the "'Hanford Beryllium Employee Questionnaire' [no date] clearly states 'Completion of this form is voluntary.' Hence, the statement is indicative of an anomaly or a single or isolated incident that...is misleading and not indicative of the well-established practice. Moreover, there is no basis for the implied hypothesis that one third of all workers who request information decline testing because of the questionnaire." Brackets added.

The Council notes that the trigger for workers to be scheduled at HEHF has been the return of the questionnaire. Although it may be possible to be tested without completing the questionnaire, it appears there is not a process for doing so. In a meeting to review an early summary of this report in the summer of 2001, HEHF personnel indicated agreement with the Council recommendation that the questionnaire should be given to workers after the first LPT blood draw and agreed with the assessment that the requirement for the questionnaire to be submitted first does impede people. The practice may have changed in recent months. However, in "Beryllium Exam Processes 1/8/02 Effective: 1/8/02 Supersedes: 8/15/01" the 4th step, assigned to HS-1 receptionist is "Collect Be medical history form and the Hanford Beryllium Employee Questionnaire from patient." Routing to the lab for Be-LPT is step 8. It appears that waiver of the requirement to complete the questionnaire before having the blood

draw would be outside normal procedure. See also endnote number 8 above.

[18] HEHF notes, "there is no basis in fact for the assertion that epidemiological data is not being systematically collected...such data is being routinely collected in a number of ways, including the 'Questionnaire.'"

[19] HEHF notes that it has received no complaints regarding this issue; and that such information is not used for purposes other than epidemiology. "...medical information released to DOE officials responsible for CBDPP, scientists and researchers working under DOE agreements, and the Oakridge Institute Science and Education, does not include personal identifiers, such as name, social security number, address or phone number, and thus cannot be used to identify particular individuals. See 'Beryllium Medical Support Plan,' [Effective: 2/28/02 Supersedes: 2/6/02] p.4 (Recordkeeping)." Brackets added.

The Council notes that workers have concerns regarding confidentiality even with policies in place and written notice to the workers. The Council suggests that facilitated dialogue with the BAG to understand and respond to the workers' concerns would be useful.

[20] HEHF notes, "HEHF has not received any complaints regarding this issue. Any worker concern that epidemiological data is being used for other purposes is unfounded, as evidenced by numerous policies that are in place, which ensure that information provided for epidemiological purposes is used solely for that purpose. See 'Hanford CBD Prevention Program,' [Rev.2 April 26, 2001] p. 9 (section 5.7 Record Keeping); 'Initial Information Packets Given One Time Prior to First Exam,' [no date] p.4 (About Your Records) and p.4 (About the Beryllium Registry); 'Exam Packets Given to Workers At Each Beryllium Exam,' [no date] p.5 (Informed Consent Form); 'Using Hanford Health Information for Epidemiology Policy.'" Brackets added.

See Council note at end of previous endnote.

[21] HEHF takes strong exception to this characterization of the Medical Surveillance Program. For example, see end notes 7, 8, 10, 17, 18, 19, 20, 26, 27, 30, 33, 40, 43, 46, 50, 55, 72, and 76.

[22] Marc Schenker, MD, MPH, University of California, Professor and Chair, Department of Epidemiology and Preventive Medicine, memo, dated October 19, 2001, in commenting on a draft of this report: "As noted above, even national experts can disagree on diagnosis, work-relatedness and other issues. I would recommend that the report advocate for a **national consensus conference** to address beryllium related disease classification, and to make recommendations regarding diagnosis, treatment, compensation, and further research needed." (Emphasis in original)

[23] 10 CFR 850.34(c).

[24] Id.

[25] 10 CFR 850.34(c)(d)(e). Also, the HEHF Medical Support Plan, (Effective: 2/28/02 Supersedes: 2/6/02) notes "(t)he multiple physician review process is verbally explained to the worker during initial and periodic evaluations. Written notification...to the worker of the right to seek a second medical opinion is given to the worker within 10 work days of receiving all test results related to that evaluation." Further, "HEHF acts consistently with the findings, determinations, and recommendations of the third physician or attempts to reach an agreement with the worker that is consistent with the recommendations of at least one of the other two physicians. If the worker desires an alternate approach to the one described here, HEHF works with that individual to make the necessary arrangements as long as the process is timely and protective of the worker." HEHF notes further that the multiple physician review program is referenced in numerous other policies and packets that are provided to the workers. An example in "Initial Information Packets Given One Time Prior to First Exam" (no date): "ABOUT FOLLOW UP EVALUATIONS. The beryllium monitoring program provides referral to specialized

facilities or providers for further evaluation for CBD if you wish additional testing. At your request, 2nd and 3rd medical opinion referral may be provided to medically credible facilities or providers for evaluation for Chronic Beryllium Disease." Another example in "Exam Packets Given to Workers at Each Beryllium Exam" (no date): "Your employer provides the opportunity under HEHF's medical surveillance program for you to seek 2nd and 3rd medical opinions as appropriate." Another example in "Information Packets Given to Workers with Abnormal Be-LPT's" (no date): "You should also be aware of your right to 2nd and 3rd medical opinions as stated in the 10 CFR 850 rule." The final sheet of that packet explains the process in detail.

The Council notes that in several instances of disagreement between HEHF and the opinion of acknowledged external experts, the opinion of HEHF personnel remained determinative without the worker understanding the process for multiple physician review.

[26] HEHF notes that it provides the "Beryllium Exam Guide," [Effective: 1/30/02 Supersedes: 1/15/01] "... which lists (at p.3) four local physicians; 'Information Packet Given to Workers With Abnormal LPT's,' [no date] p. p. 1-2, which lists five local physicians and facilities available for follow up diagnostic screening and care for workers who possibly have beryllium related conditions and/or sensitization to beryllium, some of whom are willing to act as attending physicians for workers' compensation claims." Brackets added.

The Council notes that HEHF's providing lists of physicians and facilities is a good starting point for workers seeking further medical diagnoses and information. Recommendations for HEHF's role in addressing the workers' concerns about these resources are found in the MS and MI sections.

[27] HEHF notes that workers are informed that the UW and NJMC are providers of diagnosis and screening; and that "HEHF is in the process of implementing a review process that will include outside physician experts."

See also endnote 25 above.

[28] The Environmental Protection Agency characterizes beryllium as a likely human carcinogen and estimates the cancer risk from breathing air for 24 hours per day, seven days a week over a lifetime at the USDOE Action Limit of $0.2\mu g/m^3$ as one in two thousand (5E-4). SEE USEPA; SF-83 Supporting Statement; Standards of Performance; NESHAP Subpart C, Beryllium; and USEPA, Office of Air Quality, Planning and Standards; "Beryllium and Compounds" Hazard Summary; Unified Air Toxics Website. See also IARC regarding cancer. See next endnote regarding skin lesions.

[29] MSDS, No. A 06. Brush-Wellman Corp.; Sec. 3.2.3 "Skin" 2001.

[30] HEHF calls attention to the "'Medical Support Plan,'" [Effective: 2/28/02 Supersedes: 2/6/02] p. 2 (Medical History section, which states that special emphasis is placed on the respiratory system, *skin, and eyes,...*'; 'Exam Guide,' [Effective: 1/30/02 Supersedes: 1/15/01] p.1-2 (Physical Examinations, which states that the baseline medical examination includes a medical examination with an emphasis on the respiratory system *and skin (i.e. ulceration or granulomatous nodular skin lesions.*)..." [Text in parentheses not in original document.] Brackets added.

The Council notes that the workers' experiences reported at MS-4 appear to reveal a disconnect between the procedures referenced above and the practice at HEHF.

[31] Workers have encountered obstacles to having granulomas, lesions or bumps on their skin, which were suspected of being beryllium-exposure related, documented at HEHF. Documentation is a necessary step for reporting to OSHA, as legally required, as well as medically advised to provide for referral.

[32] This information was confirmed in a telephone conference between the Council subcommittee

and a representative of CCSI on November 14, 2001.

[33] HEHF notes that no complaints have been filed and that they are unaware of any problem of this nature. "...external reports are considered by HEHF, as shown by the 'Medical Support Plan,' p. 3-4, in the section entitled 'Medical Removal.'...the 'Beryllium Exam Guide,' [Effective: 1/30/02 Supersedes: 1/15/01] p. 2 states, 'Medical removal from exposure to beryllium is offered to beryllium assigned workers by the responsible employer based on recommendations from the examining physician or PA.'...Where there is a disagreement among physicians, an internal peer review process is in place to resolve such disputes." HEHF notes also that the employer is responsible for reporting occupational illness and for the determination regarding whether employees are entitled to paid sick leave for absences from work. Brackets added.

The Council notes that workers report experiences that indicate there is miscommunication and misunderstanding regarding multiple medical opinions. Further, in a meeting to review a summary of this report in the summer of 2001, HEHF personnel reported that the medical review board consisted of Dr. Borders, Dr. Smick, and Dr. Brady and that the results of tests or diagnoses from the UW or NJMC are often cursory. This internal review process, though useful, is not equivalent to either a second or third opinion and does not meet the requirement for a medical dispute resolution process.

[34] In a telephone conference with members of the Council on February 22, 2002, Lee Newman, MD, MA, Head of the Division of Environmental and Occupational Health Sciences at NJMC, noted that it is important to report that lack of agreement among medical experts and lack of certainty of medical opinion often results from science not yet having supplied the answers.

[35] In a memo dated November 6, 2001, Lee Newman, MD, MA, Head of the Division of Environmental and Occupational Health Sciences at NJMC, responded to a question about having CBD in the absence of positive LPTs, "There are circumstances in which the blood and lavage may be negative but the person has CBD. They would have to demonstrate other immune response however (e.g., beryllium patch test)." In a telephone conference with members of the Council on February 22, 2002, he added that there is a small subset of individuals for whom sensitization cannot be detected by LPT, lavage, or skin patch.

[36] In the telephone conference cited above, Dr. Newman noted that the change in LPT standard was driven by prevention issues. He agreed that communication of the reasons for the change is crucial to enable workers to have a full understanding and to have their questions answered. He indicated willingness to participate in a review as suggested in MS-8 and in recommendation #11 in MS.

[37] Marc Schenker, MD, MPH, University of California, Professor and Chair, Department of Epidemiology and Preventive Medicine, in a memo dated October 19, 2001, commenting on an early draft of this report, wrote, "For purposes of beryllium disease surveillance, health protective criteria should be established for implementation by HEHF, i.e., the criteria for implementing individual protection of a worker need not be as stringent as for making a definitive diagnosis with implications for compensation, etc. This is good occupational health and preventive medicine practice. The report recognizes this principle in recommending that exposure be reduced based on one positive LPT, or pending resolution of any uncertainty about an individual's diagnosis." The standard of two positive LPTs at a level 25% higher than previously recognized for diagnosis of a positive LPT, was set by NJMC for purposes of its program to eliminate false positives. This is a different purpose than that served by preventive medicine and health protective criteria. (See Dr. Newman's comments in the previous endnote.)

[38] Workers "removed" from areas of potential beryllium exposure through work restriction are guaranteed the following "medical removal protection benefits" under 10 CFR 850.35:

- the opportunity to transfer to another job without potential exposure to beryllium at the same salary, responsibility and benefits level for which they are qualified, or can be trained in a short period of time;
- a guarantee that their salary and benefits (including salary for average and expected overtime in their former position) will remain the same for two years, even if no other equivalent position free from potential exposure is available;
- the two years of benefits (salary, etc.) are to continue even if no work is available or if the worker becomes disabled due to beryllium exposure and is unable to work (i.e., on short- or long-term disability leave);
- continuity of medical surveillance in the site beryllium program and other participation in site beryllium programs for those two years - including if the worker is on long-term disability leave or if there is no work available.

Temporary removal benefit protection (i.e., after an initial positive LPT or while awaiting a definitive diagnosis) requires moving a worker to a comparable paying job (maintaining benefits and providing training) for up to one year.

[39] Id.

[40] HEHF notes that it "...has in fact developed state-of-the-art procedures and organizational safeguards that are responsive to the needs of these workers, as clearly evidenced by its policies and practices. See, for example, 'Hanford CBD Prevention Program,' [Rev.2 April 26, 2001] 'Beryllium Medical Support Plan,' [Effective: 2/28/02 Supersedes: 2/6/02] 'Beryllium Exam Guide,' [Effective: 1/30/02 Supersedes: 1/15/01] 'Protocol for Assigning Standard Work Restriction Based on Be-LPT Results,' [Effective: 1/30/02 supersedes: New] 'Be-LPT Recalls,' [Effective: 1/8/02 Supersedes: 9/11/01] 'Support Group,' [no date, announcing meeting for 2/20/02] 'Patient Information Packets,' [no dates] 'Beryllium Program Information for Managers,' [no date] and 'Employer Information Packets.'" Brackets added.

The Council notes that HEHF is to be commended for developing and revising policies and procedures, and for preparing information packets and making them available to workers and employers. Next steps appear to be to align practices with the policies, procedures, and packets and to interact with the workers and their family members, where appropriate, to develop ways to make the programs more transparent, more accessible, and more responsive to their needs where it counts: day-to-day and case-by-case.

[41] 10 CFR 850.35(a)

[42] 10 CFR 850.34(c)(d)(e)

[43] HEHF notes that the opportunity for multiple physician review is provided and that there is a procedure in place for temporary medical removal.

The Council notes that these provisions are most meaningful when brought to the attention of and explained to workers in ways that make the information applicable to their particular and immediate circumstances as new symptoms appear and new test results are obtained.

[44] 10 CFR 850.35(a)(1)(ii). (The Americans with Disabilities Act provisions for accommodation may also be relevant.)

[45] If an alternate workplace is not offered that provides equivalent pay and benefits to the job from which the worker was removed, the worker must be offered medical removal protection benefits of up to one year of normal salary and benefits for temporary removal and a maximum of two years for permanent removal. See 10 CFR 850.35(a)(1)(ii)(4)(b)(ii)

[46] HEHF notes, "The standard work restriction is provided when a worker has one positive LPT result. SEE 'Beryllium Medical Support Plan,' [Effective: 2/28/02 Supersedes: 2/6/02] p.3, (Medical Removal); 'Beryllium Exam Guide,' [Effective: 1/30/02 Supersedes:1/15/01] p.2, (Risk

Assessment/Work Restrictions); 'Protocol for Assigning Standard Work Restriction Based on Be-LPT Results;' [Effective: 1/30/02 Supersedes: New]' Informed Consent Form' [BC-8800-731 (01/00)]." HEHF notes further "...that HEHF's policy provides that each beryllium associated worker and the contractor are to be issued a written, signed medical opinion within 10 working days of the receipt of medical tests, including temporary or permanent medical removal where appropriate in accordance with 10 CFR 850.34. See 'Hanford Beryllium Program', [Hanford Site Contractor Chronic Beryllium Disease Prevention Program Rev. 2 April 26, 2001] p. 10-11 (Medical Surveillance, Consent and Removal from Potential Exposure)," adding further, "HEHF is implementing a tracking procedure to ensure that the restrictions are issued within the timelines established by the policy." Brackets added.

The Council notes that managers received written information in the fall of 2001 that explained, if an individual tested positive at HEHF based on the beryllium LPT blood test, which requires two positive Be-LPT results, he will be given a work restriction by HEHF, and that there will be several weeks to a few months from when an employee first hears that he has a positive LPT test, and when HEHF writes a work restriction. BAG members confirmed that restrictions were generally given only after a second test, although there were a few exceptions, a fact that is noted in the text.

The Council notes further that the "Protocol for Assigning Standard Work Restriction Based on Be-LPT Results, Effective 1/30/02," referenced in HEHF's comment above states, "Previous Beryllium Workers: A work restriction is routinely assigned to previous beryllium workers who are sensitized either as determined by 2 positive Be-LPT's or diagnosed as sensitized by followup evaluation. *First Be-LPT: positive – work restriction is not assigned.* Second Be-LPT: positive – standard work restriction is applied." (Emphasis added.) The document also provides for Beryllium Assigned Workers (def: "Workers whose work activities involve the potential for airborne beryllium exposure will be designated as beryllium assigned workers by their supervisor." Hanford Site Contractor Chronic Beryllium Disease Prevention Program Rev. 2 April 26, 2001): "First Be-LPT: negative or borderline – work restriction is not assigned. First Be-LPT: positive – assign standard work restriction. Second Be-LPT: negative – work restriction remains in place; order third Be-LPT to be drawn in 4-6 months." The Council's information set forth in this report, that work restrictions are typically offered after two positive LPT results, is accurate for non-beryllium-assigned workers.

[47] Lee Newman, MD, MA, Head of the Division of Environmental and Occupational Health Sciences at NJMC, in a telephone conference with members of the Council on February 22, 2002

[48] June 28, 2000; DOE ESH Interpretations; Record ID: D00-06-004; Medical Removal For Beryllium Sensitization".

[49] Id.

[50] HEHF notes that, as of March 15, 2002, they are in the process of updating all work restrictions.

[51] One year of salary and benefit protection is required to be provided to workers given "temporary" medical removal pending a final medical determination.

[52] Workers "removed" from areas of potential beryllium exposure through work restriction are guaranteed "medical removal protection benefits" under 10 CFR 850.35, as described above in endnote 38.

[53] SEE D01-11-003; Interpretations; "Medical Removal Requirements - beryllium; 11-20-2001: "Under the medical removal section of the Rule, 850.35, if you're a permanently removed (sic) from beryllium areas the responsible employer should offer you the opportunity to transfer to

another available position that you are qualified for (or can be trained for in a short period of time), or provide you with medical removal protection benefits for a maximum period of two years.... If you accept medical removal, you should understand that what occurs after you exhaust your medical removal protection benefits is not covered within the scope of the Rule. Your responsible employer must develop policy for this type of situation."

[54] It is the responsibility of the SOMD (at HEHF) to provide workers with a copy of the Rule, and to answer any questions regarding medical removal. 10CFR850.35(a)(3). It is the responsibility of the employer to provide the worker, who has been permanently or temporarily removed from beryllium exposure, the opportunity to transfer to another position where beryllium exposures are as low as possible, if such a position is available (and provide training) or if such a position becomes available. 10 CFR 850.35(b)(1)(i). If no such position is available, then the employer must maintain the worker's salary and benefits for two years, even if there is no work available.

[55] HEHF notes that the standard work restriction is provided when a worker has one positive LPT result. See "Beryllium Medical Support Plan," [Effective: 2/28/02 Supersedes: 2/6/02] p.3, (Medical Removal); "Beryllium Exam Guide," [Effective: 1/30/02 Supersedes: 8/15/01] p.2, (Risk Assessment/Work Restrictions); "Protocol for Assigning Standard Work Restriction Based on Be-LPT Results"; [Effective: 1/30/02 Supersedes: New] "Informed Consent Form." Brackets added.

The Council has noted above (in endnote 46) information to the contrary. In addition, in an interview with the Council subcommittee, IH personnel explained that it takes two positive test results. This information is consistent with the information in HEHF's "Protocol for Assigning Standard Work Restriction Based on Be-LPT Results," quoted in endnote 46.

[56] This list, maintained on the Hanford website, lists all 62 facilities known to have housed beryllium-related operations or where beryllium was stored. The list has five categories, which range from facilities where airborne beryllium presence has not been fully surveyed, to facilities with low detections of airborne beryllium but potential for unmonitored beryllium in areas that could not be accessed for monitoring, to facilities where beryllium was stored. The list now pops up when a work package is being planned under the Automated Job Hazard Analysis.

[57] See: "Beryllium Contamination from Equipment Removal"; Dec. 2000; 2001-RF-KH-003; 2000-12-004, available on USDOE's "Lessons Learned" program website and distributed to all sites, which are required to review "Lessons Learned" for applicability on site, and to take appropriate action. At Rocky Flats, lab equipment was moved in a beryllium facility where ambient air samples were well below the regulatory action limit and surface samples for surfaces below eight feet above the floor were below the MDL. The MDL utilized at Rocky Flats for this facility was five times lower than the MDL used by Fluor Hanford for surface contamination in numerous Hanford facilities ($0.1\mu g/100cm^2$ versus $0.5\mu g/100cm^2$). During the work, a breathing zone sampler was run. It took two weeks for results to be returned. The results showed airborne beryllium levels during the work had exceeded the regulatory action limit for airborne beryllium by more than 500%. Later sampling of surfaces in the room found contamination at 450% of the regulatory limit for beryllium from 10 CFR 850.31. The experience clearly showed that disturbance of hidden surface contamination, even where detected surface contamination is below an appropriate MDL, can result in exposure and inhalation at levels above the regulatory limit. USDOE recommended that respiratory protection be used in all such facilities where work may disturb surface contamination and that there may be a need for additional surface sampling.

[58] 64 FR 68856.

[59] "While DOE acknowledges that this rule may not eliminate the risk of contracting CBD, DOE believes that this rule will significantly decrease the number of workers exposed and the level of exposure to beryllium, and is, therefore, expected to decrease disease. First, DOE is establishing an 8-hour TWA (time weighted average) action level of 0.2μg/m^3 that triggers certain workplace precautions and control measures. Second, DOE is requiring its contractors and any covered DOE employers to establish in their CBDPPs exposure reduction and minimization measures designed to reduce potential exposure to levels below the action level." 64 FR 68855, Dec. 8, 1999 (parentheses added). "Data have suggested that CBD can occur at relatively low exposure levels and, in some cases, after relatively brief durations of exposure." Id. at 68856. It should be noted that researchers report that cases of sensitization have been found at levels approaching 0.01μg/m^3, but no cases have been observed below that level.

[60] It should be noted that, in fact, ambient air samples are below the detection limit of 0.009μg/m^3.

[61] FR June 3, 1999, Vol. 64, #106, p 29811. See also "Contribution of Incidental Exposure Pathways to Total Beryllium Exposures"; Applied Occupational and Environmental Hygiene, Volume 16(5): 568-578, 2001; Deubner, Lowney et al at 568. "Using published data on other metals, this article describes the likely range of doses that a worker might incur in the workplace due to incidental exposure pathways; i.e., exposures not directly related to inhalation of workplace air, such as hand to mouth exposure, dermal contact, and the resuspension following deposition of beryllium onto clothing. This analysis indicates that these incidental routes of exposure could contribute to total absorbed doses of beryllium that exceed simple airborne inhalation exposures."

[62] See New Jersey Department of Health MSDS for powdered beryllium oxide: "The following recommendations are only guidelines and may not apply to every situation. At any exposure level use a ... respirator." See also Brush Wellman MSDS: "When airborne exposures exceed or have the potential to exceed the occupational limits shown in Section 8.13 [2.0μg/m^3], approved respirators must be used as specified by an Industrial Hygienist or other qualified professional.... Exposure to unknown concentrations of particulate requires the wearing of a pressure-demand airline respirator or pressure-demand self-contained breathing apparatus (SCBA)...." See also Deubner, Lowney et al: One reason why these recommendations are relevant is "calculations suggest that exposure from these alternate pathways (i.e., pathways other than direct inhalation of workplace air) may contribute to beryllium exposures that are as much as two orders of magnitude higher than exposure from direct inhalation of workplace air." Op. cit. at 575

[63] In a draft CBDPP, dated June 1998, Kaiser-Hill, the prime contractor at Rocky Flats adopted this standard. "Non-beryllium operations areas shall be maintained below 0.2μg/100cm^2 beryllium. Areas found to exceed this will be classified as beryllium operations areas and/or decontaminated. Upon successful decontamination to levels below 0.2μg/100cm^2, these areas can be reclassified as non-beryllium operations areas."

[64] For differing perspective on why the standard may already apply:

Question:

Is the standard of 0.2μg/100cm^2, adopted with the stated purpose of protecting non-beryllium workers from exposure to surfaces above that level, already applicable to surfaces in areas of any facility that are released to non-beryllium work or uses?

For the Affirmative:

The 0.2μg/100cm^2 standard of 10 CFR 850.31 may already be applicable to surfaces outside

regulated beryllium areas based on the legislative history of the rule and intent to protect workers in non-regulated areas from exposure above 0.2μg/100cm^2. Fluor's interpretation of the rule defeats its purpose of protecting non-beryllium assigned workers and the public from exposure to surfaces with contamination above 0.2μg/100cm^2. If beryllium contaminated equipment (>0.2μg/100cm^2) cannot be moved out of a regulated beryllium operation area into a non-regulated area, then designating a previous beryllium work area as unregulated would not be consistent with the rule, unless the surfaces in the area where non-beryllium assigned workers may be exposed were sampled and found not to exceed 0.2μg/100cm^2.

Fluor Hanford's objection to the standard proposed in mid-1999 stated that this rule would apply to "surfaces in areas of a facility that are released to non-beryllium work or uses" (Federal Register, June 3, 1999). Fluor proposed that the standard be set at 1.0μg/100cm^2. In June 1999, USDOE rejected Fluor Hanford's proposed standard and issued a Notice in the Federal Register that it was considering setting the standard at 0.1μg/100cm^2. USDOE did not state in the Federal Register Notice rejecting Fluor's proposal, or in the later Notice adopting 10 CFR 850.31, that Fluor Hanford's claim (that the standard in 10 CFR 850.31 applied to surfaces in all non-beryllium work areas), as erroneous or misplaced. Fluor proceeded to sample using an MDL of 0.5μg/100cm^2, which is why this question of applicability of the standard arises.

Further support for the view that the 0.2μg/100cm^2 is applicable to surfaces in facilities that had previously been used for beryllium is found in Kaiser-Hill's (the prime contractor at Rocky Flats) CBDPP (beginning June, 1998), which had a "surface action level," specifying that: "Non-beryllium operations areas shall be maintained below 0.2μg/100cm^2 beryllium. Areas found to exceed this will be classified as beryllium operations areas and/or decontaminated. Upon successful decontamination to levels below 0.2μg/100cm^2, these areas can be reclassified as non-beryllium operations areas." Rocky Flats' program is cited in the Notice accompanying the Rule and in the Implementation Guide.

The stated intent of the rule is to protect all workers from exposure to surface contamination above this level, and prevent additional illness. If moving contaminated equipment out of the regulated area is impermissible, then the intent of the rule cannot be circumvented by designating former beryllium operations areas (and areas in the facilities where beryllium is reasonably expected to have spread) as non-regulated, even if the area may contain equipment and items with surface contamination levels above 0.2μg/100cm^2. This interpretation and application to occupied non-beryllium work areas will also protect the sensitized and CBD affected workers, who have been continuing to work in facilities with potential beryllium surface contamination.

<u>For the Negative:</u>

During the promulgation of 10 CFR 850 in 1999, Fluor-Daniel Hanford, Inc. recommended to DOE that the same release criterion for beryllium surface contamination level should be applied to both released equipment and to areas of a facility that are released or transferred to non-beryllium work uses. (FR June 3, 1999, Volume 64, Number 106, p 29811) However, DOE rejected the proposal to set a limit for a facility, and instead set a removable contamination standard of 0.2μg/100cm^2, applicable only to equipment and items released to the public, or released for use to a non-regulated area.

DOE cites that 10 CFR 850 does not contain a surface contamination level that must be met for an area that was used for beryllium activities to be considered 'clean' (DOE Precedented Interpretations, D00-02-004). In the absence of a clearly stated standard in the Rule for surface contamination for a non-regulated facility, Fluor Hanford sought DOE's determination if the

$0.2\mu g/100cm^2$ equipment release surface limit stated in their rule was applicable to characterization of facilities. In their official interpretation, DOE determined it was not. (DOE Precedented Interpretations, D01-11-005) It should be further noted that 10 CFR 850 was published in 1999, and since that time, DOE has not revised the Rule to include such a standard.

DOE's position is that there is no scientific evidence that surfaces cleaned to $1.0\mu g/100cm^2$ would result in airborne concentrations that would be harmful to workers. (FR December 8, 1999, Volume 64, Number 235, p. 68887) Thus, characterization with an MDL of $0.5\mu g/100cm^2$ was acceptable. "No reliable correlation has been established between surface contamination level and airborne concentrations of beryllium. DOE, therefore believes that using a surface contamination level limit as a trigger for the establishment of regulated areas would produce minimal benefits to worker health and has not adopted this recommendation." (FR December 8, 1999, Volume 64, Number 235, p. 68879)

[65] 64 FR 68856.

[66] "Beryllium Contamination from Equipment Removal"; USDOE-EH Program Lessons Learned; 2001-RF-KH-003; 2000-12-14. It is worth noting that the airborne contamination that was found was at a level 100 times greater than the level ($0.01\mu g/m^3$) at which, according to recent literature, researchers have observed no instances of sensitization.

[67] 10 CFR 850.24 (g)(1) "requires responsible employers to notify affected workers of monitoring results, in writing, within 10 working days of receipt of the monitoring results." 64 FR 68878, explanatory statement for Section 850.24. This section also requires that workers receive notice either through individualized written communication, or "posting of monitoring results in a location or locations readily accessible to affected workers." Id. The notice and posting provisions of 10 CFR 850.24(g)(1) apply to all monitoring results, not just those results for areas where the action level is exceeded. 10 CFR 850.24(g)(2) and (3) specify requirements for notice to workers when the monitoring results reveal exposures may exceed the action level.

[68] 10 CFR 850.21 requires a hazard assessment for facilities where beryllium has been, or is, present. The definition of contaminated material sets a standard of $0.2\mu g/100cm^2$, which DOE Interpretation D00-02-004 says should be consistent with the rationale for whether an area can be used for non-beryllium operations. SEE "Implementation Guide for use with 10 CFR Part 850, Chronic Beryllium Disease Prevention Program, 1-4-10; DOE F 440. 1-7A." The Implementation Guide states, "High dust generation is expected in situations similar to D&D work, machining, aggressive cleaning, or the dismantling of equipment. ..." Id at 25. The Guidance includes Examples of Potential Beryllium Contamination Areas which are often overlooked in sampling: room corners, "areas under an object not routinely cleaned... hidden surfaces, area under a cabinet drawer, areas at the top of air ducts, area at the top of light fixtures; Area at the top of girders or other structural members..." From these examples, the concern of electrical workers, D&D workers, carpenters and health physics technicians (the workers who survey for radiation) is very reasonable, as is the concern of affected workers doing routine or office work in beryllium-suspect facilities when they know that many of these areas have not been sampled in their own workspace and that dust-disturbing work may occur in the facility.

[69] 10 CFR 850.31; these samples in Building 334-A, which is closed, ranged up to $1.1\mu g/100cm^2$, yet for some reason this facility was listed as "cleared," while noting that all surfaces above eight feet should be considered as probably contaminated.

[70] E.g., Building 326 had one room with surface contamination above the limit found in 10 CFR

850.31 of 0.2μg/100cm^2.

[71] See prior information at MS-13 in which it is noted that the beryllium health advocates lack uniform job descriptions and required qualifications. For most contractors, the position is a part-time responsibility added to existing responsibilities.

[72] HEHF notes, "No complaints have been filed and HEHF is unaware of any violations of its established policies, which are stringently enforced, that limit the disclosure of medical information to those who have a need to know." "See 'Custody and Control of Hanford Site Health Information' [Effective: 4/25/00 Supersedes: 02/14/99] and 'Information Protection policy.'" [Effective: 4/25/00 Supersedes; 02/14/99] Brackets added.

The Council notes that at least one incident has been reported to HEHF, and was acknowledged with a letter of apology.

[73] Dr. Maria Pavlova, DOE Center for Risk Excellence, Risk Excellence Notes, May, 2001 at P.7.

[74] Id.

[75] 10 CFR 850.37 (f)

[76] HEHF has established a support and counseling group disassociated from the BAG for those who wish to participate.

The Council notes that it first discussed the matter of a confidential support group associated with the BAG with HEHF in the spring of 2001. When the matter was raised with HEHF again in the summer of 2001, HEHF suggested that the facilitator would be a staff psychologist from HEHF. The Council interviewers made several recommendations. First, that a staff psychologist would have a conflict between two roles: as the person responsible for finding workers fit for work or not, and as a confidential facilitator privy to the information workers need to share in a counseling and support setting. Second, the BAG needed to be intimately involved in determining the need for and functions of a separate support group. Third, the BAG needed to participate in the process for establishing the separate support group and selecting the facilitator. HEHF indicated the comments seemed worthwhile. Ultimately, for the initial meeting convened by HEHF and announced to the workers, held on February 20, 2002, the second and third suggestions were not used.