CH2M HILL
Plateau Remediation Company
PO Box 1600
Richland, WA
99352

CH2MHILL
Plateau Remediation Company

February 22, 2011 CHPRC-1100971

Ms. Jacqueline D. Rogers, Office of Worker Safety and Health Policy
Office of Health, Safety and Security
U.S. Department of Energy
Docket No. HS-RM-10-CBDPP
1000 Independence Avenue, SW
Washington, DC 20585

Dear Ms. Rogers:

RESPONSE TO THE U.S. DEPARTMENT OF ENERGY – HEADQUARTERS' REQUEST FOR INFORMATION REGARDING TITLE 10, CODE OF FEDERAL REGULATIONS, PART 850

On December 23, 2010, the U.S. Department of Energy (DOE) published a Request for Information (RFI) in the Federal Register (Volume 75, Number 246) regarding Title 10, Code of Federal Regulations, Part 850. The RFI contained 11 questions pertaining to the DOE Chronic Beryllium Disease Prevention Program.

CH2M HILL Plateau Remediation Company's (CHPRC) responses to the 11 questions are attached.

If you have any technical questions regarding CHPRC's responses, please contact Scott Seydel. Mr. Seydel's email address is scott_seydel@rl.gov and his direct phone number is (509) 373-4860.

Sincerely,

Terry L. Vaughn
Vice President
Safety, Health, Security & Quality

tlv/mrc

Attachment

ATTACHMENT

CHPRC-1100971

DOE REQUEST FOR INFORMATION REGARDING TITLE 10, CODE OF FEDERAL REGULATIONS, PART 850 – CHPRC RESPONSE

Consisting of 7 pages,
including this cover page

U.S. Department of Energy Request for Information Regarding Title 10 Code of Federal Regulations 850 – CHPRC Response

1. *DOE currently defers to the Occupational Safety and Health Administration (OSHA) for establishing the permissible exposure limits (PEL) and uses an action level as the administrative level to assure that controls are implemented to prevent exposures from exceeding the permissible exposure limits. Should the Department continue to use the OSHA PEL? Please explain your answer and provide evidence to support your answer.*

   There is a subtle but critical difference between a PEL and an action level. A PEL is developed with the intent that it is a "Never To Exceed" limit. Within DOE, exceeding a PEL requires reporting through the Occurrence Reporting & Processing System (ORPS) and may have regulatory repercussions. Exceeding an action level (or having the realistic potential to exceed), however, merely triggers additional controls by the contractor.

   If a contractor is effectively implementing controls when the action level is approached or exceeded, it is unlikely that the PEL will be exceeded. Failure by a contractor to effectively implement controls when the action level is exceeded would be subject to regulatory penalty. It is for DOE to decide whether its regulatory enforcement system is best served by having both a PEL and an action level.

2. *Should the Department use the 2010 ACGIH threshold limit value (TLV) of 0.05 $\mu g/m^3$ (8-hour time-weighted average of 0.05 microgram of beryllium, in inhalable particulate matter, per cubic meter of air), for its allowable exposure limit? Please explain your answer and provide evidence to support your answer.*

   CHPRC does not recommend that the Department adopt the 2010 ACGIH TLV of 0.05 $\mu g/M^3$ (8-hr TWA) for its allowable exposure limit (AEL). There are two flaws with using the TLV as an AEL. First, the TLV-TWA is a long-term average concentration that focuses on the health effects from exposure to chemicals without regard for economic and technical feasibility. The 1988 ACGIH TLV® policy statement[1] states:
   - TLVs® are only one of multiple factors to be considered in evaluating specific workplace situations and conditions.
   - TLVs® are guidelines and not designed to be used as standards.
   - TLVs® are not consensus standards.
   - TLVs® do not take into consideration economic and technical feasibility or the availability of acceptable methods to determine compliance during development.

   Inhalable particulate sampling was originally developed for use with gravimetric analysis. It wasn't designed with the intent of identifying and quantifying contaminants that are only present in nanogram concentrations. Questions regarding accuracy of analysis, the ability of analytical laboratories to handle large numbers of inhalable samplers, control of cross-contamination from sampler reuse, and sampling in radiologically contaminated

[1] ACGIH Policy Statement (1998) [http://www.acgih.org/tlv/PosStmt.htm]

environments still need to be resolved. For example, CHPRC's contract with DOE requires that CHPRC send its IH samples to the Waste Sampling and Characterization Facility (WSCF). WSCF isn't currently set up to analyze samples collected with inhalable particulate samplers. While they could quickly configure their laboratory to handle a limited number of inhalable particulate samples, the handling of a large number of inhalable particulate samplers would pose problems because they don't currently have space that could be dedicated to the unloading, cleaning, drying, and reloading of the samplers.

Second, even if one accepts ACGIH's rationale for lowering the TLV-TWA to 0.5 $\mu g/M^3$, ACGIH states: "when applying this TLV-TWA it should be kept in mind that it is based on a long-term average concentration.[2]" Therefore, the TLV-TWA was not developed with the intent that it would be used as a hard limit that is never exceeded.

3. *Should an airborne action level that is different from the 2010 ACGIH TLV for beryllium (8-hour time-weighted average of 0.05 microgram of beryllium, in inhalable particulate matter, per cubic meter of air) be established? If so, what should be the level? Please explain each of your answers and provide evidence to support your answers.*

   CHPRC doesn't recommend changing to the use of an inhalable particulate standard as an action level due to the unresolved concerns regarding the analysis of the samples (discussed in answer #2). More generally, lowering the action level would have a minimal impact on CHPRC and other Hanford contractors. In the Hanford Site Chronic Beryllium Disease Prevention Program (DOE-0342), the action level is defined as 0.1 $\mu g/M^3$ (8-hour TWA). Further, DOE-0342 requires that a beryllium-regulated area must be established if airborne concentration exceeds, or can reasonably be expected to exceed, the action level. Because the Hanford Site action level is already so close to the reporting limit for beryllium, any quantifiable airborne beryllium must be considered to be an indication that the action level could reasonably be expected to be exceeded.

4. *In the past DOE encouraged, but did not require, the use of wet wipes rather than dry wipes for surface monitoring. DOE's experience with wipe testing leads the Department to consider requiring the use of wet wipes, unless the employer demonstrates that using wet wipes may cause an undesirable alteration of the surface, in order to achieve greater comparability of results across the DOE complex and in response to studies demonstrating that wet wipes capture more of the surface contamination than do dry wipes. Should the Department require the use of wet wipes? Please explain your answer and provide evidence to support your answer.*

   The use of wet wipes for surface monitoring has been the standard process at the Hanford Site for several years. While CHPRC isn't aware of any studies conducted on the Hanford Site comparing the collection efficiency of wet wiping versus dry wiping, the consensus is that wet wiping is more efficient at collecting particulate matter off of hard surfaces. Further,

[2] ACGIH® ©2009 Beryllium and Compounds documentation.

the use of wet wipes is consistent with the *OSHA Technical Manual APPENDIX II: 2–1. General Procedure for Collecting Wipe Samples*[3].

5. *Since the use of wipe sampling is not a common occupational safety and health requirement, how do current wipe sampling protocols aid exposure assessments and the protection of beryllium workers? How reliable and accurate are current sampling and analytical methods for beryllium wipe samples? Please explain your answers and provide evidence to support your answers.*

   Wipe samples can provide data when evaluating the potential for beryllium exposure from buildings that may have legacy contamination. Hanford has implemented a wipe sample limit of 0.2 $\mu g/100\ cm^2$ for characterizing facilities with potential legacy contamination.

   While useful, wipe samples have important limitations. Because beryllium occurs naturally in soil, a wipe sample taken from a sufficiently dirty surface will have measurable beryllium. Because many of the buildings being characterized by CHPRC are currently unoccupied and awaiting demolition, many of the surfaces have a significant amount of accumulated material collected upon them.

   For characterizing filthy surfaces, Hanford Site contractors use bulk samples. A bulk limit of 2 $\mu g/g$ was developed at Hanford based on the 95% UTL concentration of beryllium in the soil at the Hanford Site. As noted in the HSS Assessment of the Hanford Site Chronic Beryllium Disease Prevention Program, the use of 95% UTL concentration may not be sufficiently protective. While in most cases concentrations above 2 $\mu g/g$ may reasonably be assumed to be from anthropogenic beryllium sources, concentrations below 2 $\mu g/g$ do not necessarily indicate the absence of anthropogenic beryllium.

   Hanford Site contractors are currently working to develop data to see if it is possible to use metal ratios to determine whether beryllium in wipe or bulk samples is from natural or anthropogenic sources. At the current time a team is using the EPA Data Quality Objectives (DQO) process to develop a sampling plan for collecting the source data for determining whether metal ratios can be used.

   A final limitation of wipe samples is that there is currently not any way to correlate surface contamination with airborne contamination levels. While the absence of measureable beryllium contamination on surfaces is indicative that airborne exposures will be below the action level, measureable beryllium contamination on surface may not generate any measureable airborne exposures.

[3] OSHA Technical Manual: Section II: Chapter 2, Section V. Wipe Sampling Methodology, TED 01-00-015 [TED1.0.15A], November 18, 2008.

6. *What is the best method for sampling and analyzing inhalable beryllium? Please explain your answers and provide evidence to support your answers.*

   CHPRC hasn't collected any inhalable beryllium samples, so we do not have any direct experience with the sampling and analysis of inhalable beryllium samples. As discussed above, several critical issues associated with the sampling and analysis of inhalable beryllium samples need to be resolved.

7. *How should total fraction exposure data be compared to inhalable fraction exposure measurements? Please explain your answer and provide evidence to support your answer.*

   CHPRC is not aware of any method that has been validated for comparing total fraction exposure data with inhalable fraction exposure measurements.

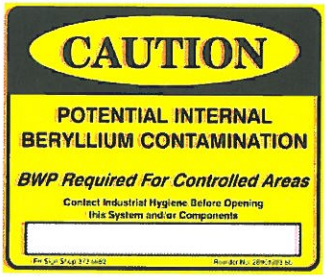
8. *Should surface area action levels be established, or should DOE consider controlling the health risk of surface levels by establishing a low airborne action level that precludes beryllium settling out on surfaces, and administrative controls that prevent the buildup of beryllium on surfaces? If surface area action levels are established, what should be the DOE surface area action levels? If a low airborne action level should be established in lieu of the surface area action level, what should that airborne action level be? What, if any, additional administrative controls to prevent the buildup on surfaces should be established? Please explain each of your answers and provide evidence to support your answers.*

   While airborne action levels work well for known beryllium operational areas, they are more problematic for buildings that may have legacy beryllium contamination. For work in facilities where no current beryllium activities are occurring, a determination must be made whether the potential for legacy beryllium contamination exists. If the potential exists for legacy contamination, characterization to determine the potential for airborne must be completed. As discussed in Answer #5, the use of surface sampling has benefits in characterizing facilities that may have legacy beryllium contamination.

   While the Hanford Site has selected 0.2 $\mu g/100\ cm^2$, this value was selected without any scientific basis. Rather it was selected because it is the limit that is contained in 10 CFR 850.31 for the release of equipment to the public. As noted in Answer #5, any sufficiently dirty surface has the potential to exceed this limit due to naturally occurring beryllium. In 10 CFR 850.30, the Department has set a housekeeping limit of 3 $\mu g/100\ cm^2$. If the Department has data showing that this limit is adequately protective of employees, it should be strongly considered for use as a surface contamination action level.

9. *Should warning labels be required for the transfer, to either another DOE entity or to an entity to whom this rule does not apply, of items with surface areas that are free of removable surface levels of beryllium but which may contain surface contamination that is inaccessible or has been sealed with hard-to-remove substances, e.g., paint? Please explain your answer and provide evidence to support your answer.*

   Hanford has instituted the use of "Potential Internal Beryllium Contamination" labels for items that may have internal contamination. An example of the label is below:



   While this sign may be used during the transfer of equipment between DOE entities, its most common use is to alert Hanford employees that the component or system may have internal contamination. Two common uses is the labeling of gloveboxes and ventilation systems and the labeling of equipment that has been used in a beryllium controlled area. CHPRC recommends the development of a requirement for labeling items that may be internally contaminated with beryllium.

10. *Should the Department establish both surface level and aggressive air sampling criteria (modeled after the U.S. Environmental Protection Agency's aggressive air sampling criteria to clear an area after asbestos abatement) for releasing areas in a facility, or should the Department consider establishing only the aggressive air sampling criteria? Please explain your answers and provide evidence to support your answers.*

    In responding to this question it is assumed that the Department is referring to release of areas that have previously been identified as beryllium contaminated. The asbestos clearance criteria requirements in the USEPA regulation were designed to provide cleanliness levels sufficient for occupancy by the general public. If the Department's intent is to use aggressive sampling to release facilities to the public, this rationale may be considered appropriate. This also means, however, that the department must establish similar requirements for decontamination of beryllium contaminated areas as those used for asbestos abatement activities. This would include, but not be limited to, establishment of containment barriers for the control of beryllium during the decontamination activities, keeping the containments under negative pressure as compared to the outside, providing personal decontamination facilities, waste packaging requirements, and additional training for beryllium decontamination workers. This would add a significant cost and time to the process currently being used at most sites in the complex. A thorough cost/benefit analysis should be undertaken to assess the justification of the additional effort that would be undertaken with the implementation of aggressive air sampling. It should be noted that the use of aggressive

air sampling is only found in the USEPA asbestos regulation and that other hazardous agents (lead, radiological) do not have requirements for aggressive air sampling as part of the decontamination process.

If it is the Department's intent to clean beryllium contaminated areas for re-occupancy by site workers, the use of surface sampling to release the area, as currently being done on most sites, may be more appropriate. The Department should have sufficient data available at its site to determine if the use of surface sampling to release beryllium decontaminated areas is sufficiently protective for re-occupancy of site workers. Additionally, the practice currently in use on many sites is to characterize facilities as non-beryllium by the collection of surface samples. If aggressive air samples were used to release decontaminated areas to the workers, it may appear as contradictory. The Department should establish guideline for surface contamination specific to release of decontaminated areas and well as the establishment of beryllium clean facilities, since those areas are not addressed in the current standard.

11. *Currently, after the site occupational medicine director has determined that a beryllium worker should be medically removed from exposure to beryllium, the worker must consent to the removal. Should the Department continue to require the worker's consent for medical removal, or require mandatory medical removal? Please explain your answers.*

The Hanford Site CBDPP includes a requirement that employees be medically cleared before engaging in beryllium activities. If medical clearance is withheld, the employee isn't allowed into any area which has known or suspected beryllium contamination.

At the Hanford Site, the withholding of medical clearance is different from medical removal. The Department field offices have provided the site contractors direction that it is their expectation that appropriate work will be found for any employee diagnosed with beryllium sensitization (BeS) or chronic beryllium disease (CBD). An employee isn't medically removed until it is determined that they are no longer physically capable of performing work on the Hanford Site.

This method of applying the requirement for medical removal has a high degree of acceptance among workers who have BeS or CBD. To date, contractors have been able to find appropriate work for workers with BeS or CBD who are capable of continuing to work. It has been discussed, however, that as the mission at Hanford continues to evolve, there may come a time where contractors may no longer be capable of finding work for workers affected by BeS or CBD.