



U.S. Department of Energy

~~Office of River Protection~~

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

JUL 27 2007

07-ESQ-118

Mr. W. S. Elkins, Project Director  
Bechtel National, Inc.  
2435 Stevens Center Place  
Richland, Washington 99354

Dear Mr. Elkins:

CONTRACT NO. DE-AC27-01RV14136 – ASSESSMENT REPORT A-07-ESQ-RPPWTP-012, “ASSESSMENT OF BECHTEL NATIONAL, INC.’S (BNI) WASTE TREATMENT AND IMMOBILIZATION PLANT INDUSTRIAL HYGIENE PROGRAM FOR HEXAVALENT CHROMIUM,” JUNE 11 THROUGH 14, 2007

This letter forwards the results of the U.S. Department of Energy, Office of River Protection assessment of the BNI Industrial Hygiene Hexavalent Chromium monitoring and control program conducted on June 11 through 14, 2007 (Attachment). There were no findings or observations related to the Hexavalent Chromium program.

The assessors also reviewed closure documentation for findings and observations resulting from Assessment Report A-06-ESQ-RPPWTP-009. The assessors were able to close one of the three findings and one of the three observations in the report. The finding related to the exposure assessment was closed along with the observation related to exposure risk communication. The findings related to the self-assessment program and hearing conservation and observations related to ergonomics and cold stress need additional management attention and documentation prior to closure.

Please provide a formal response to the issues stated above within 30 days of receipt of this letter. The response should include corrective actions planned or taken, actionees, and due dates.

If you have any questions, please contact me, or your staff may call William J. Taylor, Assistant Manager, Office of Environmental Safety and Quality, (509) 376-7851.

Sincerely,

  
for Shirley J. Olinger, Acting Manager  
Office of River Protection

ESQ:PRH

Attachment

cc: See page 2

Mr. W. S. Elkins  
07-ESQ-118

-2-

JUL 27 2007

cc w/attach:

D. E. Gergely, BNI

D. E. Kammenzind, BNI

P. Schuetz, BNI

S. W. Sanders, PAC

C. R. Ungerecht, PAC

Administrative Record

BNI Correspondence

U.S. DEPARTMENT OF ENERGY  
Office of River Protection (ORP)  
Office of Environmental Safety and Quality (ESQ)

ASSESSMENT: ORP ESQ Assessment of Bechtel National, Inc.'s (BNI)  
Waste Treatment and Immobilization Plant (WTP)  
Industrial Hygiene Program for Hexavalent Chromium

REPORT: A-07-ESQ-RPPWTP-012

FACILITY: BNI WTP

LOCATION: Hanford Site

DATES: June 11, 2007 through June 14, 2007

ASSESSORS: Paul R. Hernandez, Lead Assessor  
Stephen L. Bump, Assessor

APPROVED BY: Patrick P. Carrier, Team Lead  
Verification and Confirmation Team

## Executive Summary

The U.S. Department of Energy, Office of River Protection conducted an assessment of Bechtel National Inc.'s (BNI) Industrial Hygiene (IH) Program as it relates to personnel exposure to Hexavalent Chromium (Cr-VI) from June 11 through 14, 2007.

The assessors reviewed the Waste Treatment and Immobilization Plant Worker Safety and Health Program, IH Plan and implementing procedures, reviewed training lesson plans, and interviewed personnel involved in the IH program to ensure that regulatory requirements as specified in 10 Code of Federal Regulations (CFR) 851, "Worker Safety and Health Program," and 29 CFR 1926.1126, "Safety and Health Regulations for Construction – Chromium (VI)," were adequately implemented.

The assessors concluded the BNI IH Program met contractual requirements with no findings or observations related to Cr-VI.

The assessors also reviewed closure documentation for findings and observations resulting from Assessment Report A-06-ESQ-RPPWTP-009. The assessors were able to close one of the three findings and one of the three observations in the report. The finding related to exposure assessment was closed along with the observation related to exposure risk communication. The findings related to BNI's self assessment program and hearing conservation and observations related to ergonomics and cold stress need additional management attention and documentation prior to closure.

Lastly, although the ergonomics issue is still open, the assessors identified a good practice with regards to the planning for addressing the issue. BNI has a Six-Sigma process underway to look at ergonomics and soft tissue injuries. The Six-Sigma team includes IH, safety, construction, and management.

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## List of Acronyms

BNI	Bechtel National, Inc.
CFR	Code of Federal Regulations
Cr-VI	Hexavalent Chromium
DOE	U.S. Department of Energy
EJTA	Employee Job Task Analysis
ESQ	Office of Environmental Safety and Quality
IH	Industrial Hygiene
JHA	Job Hazard Analysis
ORP	Office of River Protection
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RCA	Root Cause Analysis
SMAW	Shielded Metal Arc Welding (stick welding)
WSHP	Worker Safety and Health Program
WTP	Waste Treatment and Immobilization Plant

U.S. Department of Energy (DOE), Office of River Protection (ORP)  
Office of Environmental Safety and Quality (ESQ) Assessment of  
Bechtel National, Inc.'s (BNI) Waste Treatment and Immobilization Plant  
(WTP) Industrial Hygiene (IH)  
Program for Hexavalent Chromium (Cr-VI)

**Scope**

The scope of the BNI WTP IH program assessment was limited to the contractor's implementation of the Occupational Safety and Health Administration (OSHA) Standard on Cr-VI as described in 29 Code of Federal Regulations (CFR) 1926.1126, "Safety Standards for Construction – Chromium (VI)." OSHA standards are now required with the implementation of 10 CFR 851, Worker Safety and Health Programs (WSHP) as promulgated by DOE. This assessment evaluated the compliance of the BNI IH program elements as applied to personnel exposure to Cr-VI.

The assessors reviewed the IH implementing procedures, reviewed training lesson plans, and interviewed personnel involved in the IH program.

**Details**

The IH assessors conducted a series of interviews with safety professionals and a DOE Facility Representative. The IH program elements reviewed included:

Program Documentation

The assessors reviewed IH documentation including plans, procedures, IH records, and training lesson plans. Specific lesson plans included: Cr-VI General Awareness Training, and Cr-VI Craft and Supervisor Training. Specific records reviewed included: Job Hazard Analysis (JHA), Employee Job Task Analysis (EJTA), Medical Placement Evaluations, Baseline Exposure Assessment Plans and Evaluations, Management Assessment Reports, Root Cause Analysis (RCA) Reports, and evaluations of previous DOE observations. Program documentation for closure of previous findings and observations was reviewed.

With regard to the Cr-VI program, the documentation supports the conclusion that the BNI IH program is in compliance with the OSHA Standard.

With regard to closure of previous findings and observations, the program documentation would not support closure of the findings on self-assessments and noise nor the observations on ergonomic and cold stress. A Baseline Hazard Evaluation Plan has not been developed for noise or for cold stress.

### Exposure Assessment Strategy

BNI is required by 10 CFR 851, Appendix A.6, to implement a comprehensive IH program that includes at least the following elements: Initial or baseline surveys and periodic resurveys and/or exposure monitoring as appropriate of all work areas or operations to identify and evaluate potential worker health risks. BNI has developed an exposure assessment strategy procedure and has performed a formal exposure assessment on Cr-VI. The exposure assessment, the Baseline Exposure Assessment Plan, and the Baseline Exposure Assessment Evaluation were reviewed. These documents are adequate to show that BNI has evaluated the evolutions where Cr-VI exposure could be an issue, identified the workers at risk, evaluated existing monitoring data, developed additional monitoring plans, and suggested exposure controls for the Cr-VI hazard. No weaknesses were identified in this area.

### Worker Safety and Health Program

BNI was required by 10 CFR 851 to develop and implement a WSHP. This program was approved by DOE on May 16, 2007. 10 CFR 851, Appendix A.6, also requires that contractors implement a comprehensive IH program that includes at least the following elements: a) Coordination with planning and design personnel to anticipate and control health hazards that proposed facilities and operations would introduce; b) Coordination with cognizant occupational medical, environmental, health physics, and work planning professionals. This coordination is adequately described in the WSHP and is further implemented through the work planning procedure and the job hazard analysis process. No weaknesses were identified in this area.

### Industrial Hygiene Program

BNI is required by 10 CFR 851, Appendix A.6, to implement a comprehensive and effective IH program to reduce the risk of work-related disease or illness. The IH program was reviewed with respect to the approach taken to reduce the risk from Cr-VI exposure. The IH Plan calls out Cr-VI as a carcinogen. The IH plan lists exposure mitigation strategies, baseline monitoring requirement, ongoing monitoring requirements, and interface with the occupational medicine provider. With regard to Cr-VI exposure, there were no weaknesses identified in the area.

### Occupational Medicine Program

BNI is required by 10 CFR 851, Appendix A.15(2), to establish and provide comprehensive occupational medicine services to workers employed at a covered work place who are enrolled for any length of time in a medical or exposure monitoring program required by this rule and/or any other applicable Federal, State, or local regulation, or other obligation. In addition, 29 CFR 1926.1126(i)(1)(i)(A) requires BNI to make medical surveillance available at no cost to the employee, and at a reasonable time and place, for all employees who are or may be occupationally exposed to chromium at or above the action level for 30 or more days a year. WorkCARE has been

contracted by BNI to provide occupational medicine services at the WTP. WorkCARE personnel were interviewed to determine their understanding of the Cr-VI monitoring standards and the protocols used for the evaluation. The written protocol was also reviewed during the assessment. Based on the review of the WorkCARE processes and interviews, the assessors concluded WorkCARE had effectively implemented the Occupational Medicine Section of the CR-VI standard.

BNI has developed EJTA by type of work performed. EJTA's for workers potentially exposed to Cr-VI were reviewed. Cr-VI was listed as an exposure hazard. The personnel in these categories receive a physical examination using the Cr-VI protocol as a guide. BNI is exceeding the standard in this case as it is currently unlikely that any of the exposed population will exceed the Permissible Exposure Limit (PEL) for 30 or more days per year. BNI has stopped all Shielded Metal Arc Welding (SMAW) [Stick Welding] following an event in December 2006. Stick welding has the highest risk of Cr-VI exposure and is the only activity evaluated to have exposures above the PEL.

#### Hexavalent Chromium Training Program

BNI is required by 29 CFR 1926.1126(j) to ensure that each employee can demonstrate knowledge of at least the following: the contents of this section; the purpose and a description of the medical surveillance program required by paragraph (i) of this section, and the employer shall make a copy of this section readily available without cost to all affected employees. 10 CFR 851.25(a) also requires the contractors to develop and implement a worker safety and health training and information program to ensure that all workers exposed or potentially exposed to hazards are provided with the training and information on that hazard in order to perform their duties in a safe and healthful manner. The Cr-VI training programs were reviewed for consistency with these standards. The training programs and the knowledge check adequately cover the required aspects. No issues were identified in this area.

#### Record Keeping Program

BNI is required by 10 CFR 851.26.a(1) to establish and maintain complete and accurate records of all hazard inventory information, hazard assessments, exposure measurements, and exposure controls. BNI is also required by 29 CFR 1926.1126(k) to maintain accurate records or air monitoring, historical monitoring, objective data, and medical surveillance. The BNI records management procedure was reviewed and IH staff members were interviewed to determine record keeping requirements. All IH records are sent to the document control organization. If personnel sampling results are sent, they are marked "sensitive." Copies of personnel exposure records are also maintained in the individual's medical file. No weaknesses were identified in this area.

## Response to Potential Over-Exposure Event

On December 19, 2006, a welder was potentially over-exposed to Cr-VI while welding in the Low-Activity Waste Facility. On January 10, 2007, an occurrence report (EM-RP-BNRP-RPPWTP-2007-001) was issued to document the concern. A RCA was performed to determine the causal factors that led to the potential exposure above the PEL. There were two corrective actions resulting from the analysis. The first corrective action was a review of the implementation of Integrated Safety Management System during the planning, authoring, and controlling of construction work involving airborne hazardous materials. The second was establishing clear roles, responsibilities, and accountabilities for the implementation of safety requirements changes. Both action items were assigned a due date of July 31, 2007, and were still open at the time of the assessment. As an immediate corrective action all welding on stainless steel was halted by management directive. Following the initial investigation, welding other than SMAW (stick welding) was re-authorized. At the time of this assessment, all stick welding and plasma cutting of stainless steel was still on hold. It was recognized by BNI that plasma cutting will need to be restarted soon and they have stated they will perform a full JHA prior to re-starting the work. At this time there is no plan to re-authorize stick welding. The Safety Assurance management team has recognized that work planning and management of change needs to be improved to prevent these types of events. The corrective actions, when completed, should achieve this result. No weaknesses were identified in this area.

### **Results**

The assessors concluded:

The contractor's IH program plan with regard to Cr-VI met the regulatory requirements as specified in 10 CFR 851, "Worker Safety and Health Program," and 29 CFR 1926.1126, "Safety Standards for Construction – Chromium (VI)."

The assessors identified no findings or observations related to the Cr-VI monitoring and control program.

### **Findings**

None

### **Observations**

None

### **Good Practices**

None

## Conclusions

The assessors concluded that BNI WTP IH program met the intent of 10 CFR 851 and 29 CFR 1926.1126.

## Open Items from A-06-ESQ-RPPWTP-009

### Findings

#### A-06-ESQ-RPPWTP-009-F01

The BNI WTP IH program lacked a self-assessment plan.

ORP closed this action when BNI issued 24590-WTP-PL-SA-06-0001, Annual Safety Assurance Management Assessment Plan and Schedule. This plan detailed the assessments to be performed in Calendar Year 2007. As a follow-up to this closure, the assessment team asked to see progress on the scheduled assessments. To date, none of the scheduled assessments have been completed. The Safety Assurance Manager reported this was due to resource constraints resulting from the implementation efforts for 10 CFR 851 in the first half of the year. In addition, when the Field Safety Assurance Manager was asked about progress on his assigned assessments, he stated that he was unaware of the plan (in fact stated that when the assessor showed it to him, it was the first time he had seen it) and also showed the assessor that the scheduled assessments were not on the Action Tracking system used by BNI to track commitments. Some unscheduled assessments have been completed. For example, 24590-WTP-MAR-CON-07-0021 was performed to assess the materials onsite that could contain chromium. ORP has reopened Finding A-06-ESQ-RPPWTP-009-F01 because BNI has not effectively implemented the self-assessment program as required by company procedures.

#### A-06-ESQ-RPPWTP-009-F03

The hearing conservation program does not include all personnel or provide justification for their exclusion.

As the corrective action for this finding, BNI decided to place all personnel with a brown badge having green stripes in the hearing conservation program. Although this is conservative it misses the intent of the finding. No justification for the current action has been provided or is available. A Baseline Hazard Analysis Plan has not been developed and consequently, a Baseline Hazard Analysis Evaluation has not been performed. There is no monitoring data available to indicate whether the hearing protection being used by the workers is adequate for the noise exposure. There is no documented self-assessment indicating that hearing protection is being worn when required and is being worn correctly. Based on the lack of hazard evaluation and monitoring data, this item remains open.

## Observations

A-06-ESQ-RPPWTP-009-O02

The contractor's IH program lacked an ergonomic plan

There was no ergonomics plan available at the time of this assessment. Ergonomics are recognized as a hazard in the IH Exposure Assessment Strategy, but there is no mechanism in place to address the issue. BNI does have a Six-Sigma process ongoing to design an ergonomics and soft tissue injury prevention program. This has senior management commitment and is staffed by a multi-disciplinary team. Results of the team activities and implementation of the program are expected to be adequate to close this item. It will remain open until DOE verifies completion.

A-06-ESQ-RPPWTP-009-O03

The contractor lacks an effective cold stress monitoring and control plan.

BNI Procedure 24590-WTP-GPG-SIND-007A, Heat and Cold Stress Prevention, contains adequate guidance on prevention of cold stress. Although this procedure has been in place since 2001, there was no data showing any cold stress monitoring. In addition, a Baseline Hazard Analysis Plan has not been developed to monitor for cold stress and consequently no Baseline Hazard Analysis Evaluation has been performed. This item should remain open due to:

- Lack of documentation showing adequate program implementation
- Lack of documentation of hazard evaluation

## Closed Items

Finding A-06-ESQ-RPPWTP-009-F02

The BNI WTP IH program lacked a documented exposure assessment strategy.

BNI has issued Procedure 24590-WTP-GPP-SIND-062, IH Exposure Assessment Strategy. This procedure is adequate to perform exposure assessment planning and evaluation. Based on this review, it is recommended that this finding be closed.

Observation A-06-ESQ-RPPWTP-009-O01

Exposure risk communication was not formalized or clearly defined in the contractor's safety and health documents.

BNI Procedure 24590-WTP-PL-SA-06-0002, WTP WSHP, Section 3.2, clearly spells out that management will communicate safety information to the employees. Based on this commitment, this item should be closed.

**Signatures**

Paul Hernandez 7/23/07  
Paul R. Hernandez  
Assessment Team Leader

WJ Taylor 7/23/07  
for Patrick P. Carier, Team Leader  
Verification and Confirmation Team

<b>Task# ORP-ESQ-2007-0122</b>
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E-STARS<sup>R</sup> Report  
Task Detail Report  
07/27/2007 1036

**TASK INFORMATION**

<b>Task#</b>	ORP-ESQ-2007-0122		
<b>Subject</b>	CONCUR:07-ESQ-118; ASSESSMENT REPORT A-07-ESQ-RPPWTP-012, "ASSESSMENT OF BNI'S WTP INDUSTRIAL HYGIENE PROGRAM FOR HEXAVALENT CHROMIUM," JUNE 11 THROUGH 14, 2007		
<b>Parent Task#</b>		<b>Status</b>	CLOSED 07/27/2007
<b>Reference</b>	07-ESQ-118	<b>Due</b>	
<b>Originator</b>	Gano, Becky (Gano, Becky)	<b>Priority</b>	High
<b>Originator Phone</b>	(509) 376-6004	<b>Category</b>	None
<b>Origination Date</b>	07/23/2007 1353	<b>Generic1</b>	
<b>Remote Task#</b>		<b>Generic2</b>	
<b>Deliverable</b>	None	<b>Generic3</b>	
<b>Class</b>	Long Term	<b>View Permissions</b>	Normal

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BCC:  
ESQ OFF FILE  
ESQ RDG FILE  
MGR RDG FILE  
T.M.WILLIAMS, AMD  
P.P.CARIER, ESQ  
P.R.HERNANDEZ, ESQ  
J.L.POLEHN, ESQ  
W.J.TAYLOR, ESQ

RECORD NOTE:

**ROUTING LISTS**

1	Route List	Inactive
	<ul style="list-style-type: none"> <li>● Hernandez, Paul R - Review - Concur - 07/24/2007 0851 <i>Instructions:</i></li> <li>● Carier, Patrick P - Review - Concur with comments - 07/24/2007 0852 <i>Instructions:</i></li> <li>● Taylor, William - Review - Concur - 07/24/2007 0852 <i>Instructions:</i></li> <li>● Eschenberg, John R - Review - Cancelled - 07/27/2007 1036 <i>Instructions:</i></li> <li>● Olinger, Shirley J - Approve - Cancelled - 07/27/2007 1036 <i>Instructions:</i></li> </ul>	<div style="font-size: 24pt; font-weight: bold; margin-bottom: 10px;">RECEIVED</div> <div style="font-size: 18pt; font-weight: bold; margin-bottom: 10px;">JUL 27 2007</div> <div style="font-size: 24pt; font-weight: bold;">DOE-ORP/ORPCC</div>

**ATTACHMENTS**

<b>Attachments</b>	<ol style="list-style-type: none"> <li>1. 07-ESQ-118 att Assessment Report A-07-ESQ-RPPWTP-012.doc</li> <li>2. 07-ESQ-118 BNI LTR Assessment Report A-07-ESQ-RPPWTP-012 BNIs WTP IH Program for Hexavalent Chromium 6-11 thru 6-14 2007.doc</li> </ol>
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**COLLABORATION**

**Task# ORP-ESQ-2007-0122****COMMENTS**

<b>Poster</b>	Carier, Patrick P (Gano, Becky) - 07/24/2007 0807
	Concur
	Bill Taylor concurred for Pat Carier on 7/23/07.
<b>Poster</b>	Gano, Becky (Gano, Becky) - 07/27/2007 1007
	CLOSED
	John Eschenberg concurred on 7/26/07. Bill Taylor signed for Shirley Olinger, as Acting MGR, on 7/27/07.

**TASK DUE DATE HISTORY***No Due Date History***SUB TASK HISTORY***No Subtasks*

-- end of report --

**Task# ORP-ESQ-2007-0122**

E-STARS<sup>®</sup> Report  
 Task Detail Report  
 07/23/2007 0203

TASK INFORMATION			
<b>Task#</b>	ORP-ESQ-2007-0122		
<b>Subject</b>	CONCUR:07-ESQ-118; ASSESSMENT REPORT A-07-ESQ-RPPWTP-012, "ASSESSMENT OF BNI'S WTP INDUSTRIAL HYGIENE PROGRAM FOR HEXAVALENT CHROMIUM," JUNE 11 THROUGH 14, 2007		
<b>Parent Task#</b>		<b>Status</b>	Open
<b>Reference</b>	07-ESQ-118	<b>Due</b>	
<b>Originator</b>	Gano, Becky (Gano, Becky)	<b>Priority</b>	High
<b>Originator Phone</b>	(509) 376-6004	<b>Category</b>	None
<b>Origination Date</b>	07/23/2007 1353	<b>Generic1</b>	
<b>Remote Task#</b>		<b>Generic2</b>	
<b>Deliverable</b>	None	<b>Generic3</b>	
<b>Class</b>	Long Term	<b>View Permissions</b>	Normal
<b>Instructions</b>	Correspondence is being routed for concurrence via hard copy instead of electronically. Once you receive the correspondence, please approve or disapprove electronically via E-STARS and route to next person on the routing/concurrence list.  BCC: ESQ OFF FILE ESQ RDG FILE MGR RDG FILE T.M.WILLIAMS, AMD P.P.CARIER, ESQ P.R.HERNANDEZ, ESQ J.L.POLEHN, ESQ W.J.TAYLOR, ESQ  RECORD NOTE:		
ROUTING LISTS			
1	Route List		Active
	<ul style="list-style-type: none"> <li>Hernandez, Paul R - Review - Awaiting Response - Due Date <i>Paul Hernandez 7/23/07</i>  <i>Instructions:</i></li> </ul>		
	<ul style="list-style-type: none"> <li>Carier, Patrick P - Review - Awaiting Response - Due Date <i>WJTaylor 7/23/07</i>  <i>Instructions:</i></li> </ul>		
	<ul style="list-style-type: none"> <li>Taylor, William - Review - Awaiting Response - Due Date <i>WJT 7/23/07</i>  <i>Instructions:</i></li> </ul>		
	<ul style="list-style-type: none"> <li>Eschenberg, John R - Review - Awaiting Response - Due Date <i>WJT 7/26 07</i>  <i>Instructions:</i></li> </ul>		
	<ul style="list-style-type: none"> <li>Olinger, Shirley J - Approve - Awaiting Response - Due Date <i>WJT 7/27/07</i>  <i>Instructions:</i></li> </ul>		
ATTACHMENTS			
Attachments	1. 07-ESQ-118 att Assessment Report A-07-ESQ-RPPWTP-012.doc 2. 07-ESQ-118 BNI LTR Assessment Report A-07-ESQ-RPPWTP-012 BNI's WTP IH Program for Hexavalent Chromium 6-11 thru 6-14 2007.doc		
COLLABORATION			