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Carlsbad, New Mexico 88221  
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Mr. Jon E. Hoff, Manager  
Quality Assurance  
Nuclear Waste Partnership, LLC  
P.O. Box 2078  
Carlsbad, New Mexico 88221-2078

Subject: Transmittal of Audit Report A-14-06, NWP VOC/Hydrogen/Methane Monitoring Program

Dear Mr. Hoff:

The Carlsbad Field Office performed Audit A-14-06 of the Nuclear Waste Partnership, LLC (NWP) Volatile Organic Compound (VOC)/Hydrogen/Methane Monitoring Program at the Waste Isolation Pilot Plant on November 5-6, 2013. The audit team concluded that the NWP Monitoring Program continues to adequately address the upper-tier requirements, and the associated procedures evaluated were satisfactorily implemented and effective. The audit report is enclosed.

As described in the report, the audit team did not identify any conditions adverse to quality. If you have any questions concerning the report, please contact me at (575) 234-7483.

Sincerely,

Martin P. Navarrete  
Senior Quality Assurance Specialist

Enclosure

cc: w/enclosure

|                       |      |                                     |    |
|-----------------------|------|-------------------------------------|----|
| D. Gadbury, CBFO      | * ED | J. Kieling, NMED                    | ED |
| M. Brown, CBFO        | ED   | T. Kliphuis, NMED                   | ED |
| D. Miehls, CBFO       | ED   | S. Holmes, NMED                     | ED |
| F. Sharif, NWP        | ED   | R. Maestas, NMED                    | ED |
| S. Kennedy, NWP       | ED   | C. Smith, NMED                      | ED |
| B. Allen, NWP         | ED   | V. Daub, CTAC                       | ED |
| S. Punchios, NWP      | ED   | R. Allen, CTAC                      | ED |
| S. Escareno-Soto, NWP | ED   | R. Castillo, CTAC                   | ED |
| W. Ledford, NWP       | ED   | D. Harvill, CTAC                    | ED |
| T. Peake, EPA         | ED   | G. White, CTAC                      | ED |
| L. Bender, EPA        | ED   | CBFO QA File                        |    |
| S. Ghose, EPA         | ED   | CBFO M&RC                           |    |
| R. Lee, EPA           | ED   | *ED denotes electronic distribution |    |



U.S. DEPARTMENT OF ENERGY  
CARLSBAD FIELD OFFICE

AUDIT REPORT

OF

NUCLEAR WASTE PARTNERSHIP LLC  
VOLATILE ORGANIC COMPOUND / HYDROGEN / METHANE  
MONITORING PROGRAM

CARLSBAD, NEW MEXICO

AUDIT NUMBER A-14-06

November 5 – 6, 2013



Prepared by: *Rick L. Castillo*  
Rick L. Castillo, CTAC  
Audit Team Leader

Date: 1/6/14

Approved by: *Michael R. Brown*  
Michael R. Brown, CBFO  
Director, Office of Quality Assurance

Date: 1/08/2014

## 1.0 EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Audit A-14-06 was conducted to evaluate the continued adequacy, implementation, and effectiveness of the Nuclear Waste Partnership LLC (NWP) Volatile Organic Compound (VOC)/Hydrogen/Methane Monitoring Program and applicable elements of the NWP Quality Assurance (QA) Program.

The purpose of the evaluation was to verify the flow-down of upper-tier requirements through the NWP *Quality Assurance Program Description* (NWP QAPD) into applicable NWP procedures, and to determine if the procedures were effectively implemented. The audit was conducted at the Waste Isolation Pilot Plant (WIPP) November 5–7, 2013.

The audit team identified no conditions adverse to quality during the audit. See section 6.1 for details. No observations were identified during the audit and no recommendations were offered for management consideration.

Overall, the audit team concluded that the NWP VOC/Hydrogen/Methane Monitoring Program and implementing procedures, including the applicable QA program elements, are adequate in addressing upper-tier requirements. The audit team also concluded that the NWP procedures evaluated are satisfactorily implemented and effective in achieving the desired results.

## 2.0 SCOPE AND PURPOSE

### 2.1 Scope

The audit team evaluated the adequacy, implementation, and effectiveness of selected monitoring processes related to the NWP QA Program. The following criteria were evaluated:

- Organization
- Quality Assurance Program
- Training
- Document and Record Control
- VOC/Hydrogen/Methane Monitoring

The evaluation of the adequacy of the NWP monitoring programs documents was based on current revisions of the following documents:

- DOE/CBFO-94-1012, *CBFO Quality Assurance Program Document* (CBFO QAPD)
- WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Document*
- WP 12-VC.01, *Volatile Organic Compound Monitoring Plan*
- WP 12-VC.02, *Quality Assurance Project Plan for Volatile Organic Compound Monitoring*

WP 12-VC.03, *Hydrogen and Methane Monitoring Plan*

WP 12-VC.04, *Quality Assurance Project Plan for Hydrogen and Methane Monitoring*

WP 12-VC1684, *VOC Monitoring Group – Air Sampling Equipment Operations*

WP 12-VC1685, *Subatmospheric and Pressurized Air Sampling in Passivated Canisters*

WP 12-VC3209, *VOC Monitoring Group – Data Handling and Program Reporting*

## **2.2 Purpose**

The audit was conducted to determine the degree to which the NWP QA Program continues to provide adequate controls governing the characterization and certification of transuranic (TRU) waste destined for disposal at the WIPP.

## **3.0 AUDIT TEAM AND OBSERVERS**

|                     |  |
|---------------------|--|
| Martin P. Navarrete | CBFO QA Management Representative                              |
| Rick Castillo       | Audit Team Leader, CBFO Technical Assistance Contractor (CTAC) |
| Kirk Kirkes         | Auditor, CTAC  |
| Paul Gomez          | Technical Specialist, CTAC                                     |
| Trais Kliphuis      | Observer, New Mexico Environment Department (NMED)             |
| Coleman Smith       | Observer, NMED   |

## **4.0 AUDIT PARTICIPANTS**

Individuals contacted during the audit are identified in Attachment 1. A pre-audit conference was held at the WIPP in the NWP Support Building large conference room on November 5, 2013. The audit was concluded with a post-audit conference at the WIPP in the NWP Support Building large conference room on November 7, 2013.

## **5.0 SUMMARY OF AUDIT RESULTS**

### **5.1 Program Adequacy, Implementation, and Effectiveness**

The audit team concluded that the NWP VOC/Hydrogen/Methane Monitoring Program processes evaluated were adequate, satisfactorily implemented, and effective for the areas audited.

The audit team evaluated the implementation and effectiveness of sustained corrective actions for Corrective Action Reports (CARs) 12-036 (approval request/variation request forms) and 12-037 (work processes) identified during the previous audit (A-12-21). The audit team determined that the corrective actions were successful in precluding recurrence of those issues.

## **5.2 Quality Assurance Activities**

NWP implementing procedures and associated plans included in the audit are identified in Attachment 2. Attachment 3 is the Summary Table of Audit A-14-06 Results. Details of the audit are contained in the following sections.

### **5.2.1 Organization**

The audit team interviewed personnel involved in the NWP VOC/Hydrogen/Methane Monitoring Program and interviewed QA management personnel. The applicable section of the NWP QAPD, organizational charts, and other related documentation were reviewed to verify that an adequate organizational structure has been established to ensure the fulfillment of requirements for NWP QA and monitoring activities. As illustrated in the NWP organizational chart, the QA Manager reports directly to the NWP General Manager, thus providing the necessary independence and authority to conduct independent assessments of monitoring program activities in order to verify the organization's achievement of quality and to assure the effective implementation of the QA program.

There were no significant organizational changes observed within the NWP VOC/Hydrogen/Methane Monitoring Program organization since the last audit (A-12-21) performed in August 2012.

The procedures reviewed and objective evidence assembled and evaluated during the audit substantiate that applicable requirements for establishment of an organization are adequate for compliance with the upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

### **5.2.2 Quality Assurance Program**

The audit team reviewed the NWP QAPD, specifically Section 1.1, *Quality Assurance Program and Organization*, to verify that it appropriately translates and provides adequate measures for ensuring the establishment and effective implementation of a QA program, and that it complies with the CBFO QAPD. Various NWP documents and monitoring program implementing procedures and resulting records were examined to verify that the applicable QA program elements are sufficiently addressed for satisfactory implementation, such as: personnel training and qualification; quality improvement; document and record control; work processes; procurements; monitoring, measuring, testing, and data collection equipment; independent assessment; and sample control.

To verify the performance of independent assessments of monitoring program activities as required, interviews with responsible QA personnel were conducted and reviews of assessment schedules and reports were performed. Evidence examined for Fiscal Year (FY) 2013 indicated that NWP QA had performed audits of the Environmental Monitoring and VOC, Hydrogen, and Methane Monitoring Programs. The results of

these assessments were positive and indicated that monitoring program activities continue to achieve the desired results.

The procedures reviewed and objective evidence assembled and evaluated during the audit substantiate that the applicable requirements for the establishment of a quality assurance program are adequate for compliance with the upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

### **5.2.3 Personnel Training and Qualification**

The audit team conducted interviews with responsible personnel and reviewed implementing procedure WP 14-TR.01, Rev. 13, *WIPP Training Program*, relative to the training and qualification of personnel, to determine the degree to which the procedure adequately addresses upper-tier requirements. The results of the procedure review indicated that upper-tier requirements are adequately addressed.

Personnel training records associated with the VOC/Hydrogen/Methane Monitoring Program were examined to verify implementation of associated requirements and to verify that personnel (samplers, scientists, field staff, records coordinators, validators, etc.) performing these program activities are appropriately qualified. Training and qualification records reviewed included qualification plans, qualification cards, transcripts, exams, and required reading documentation. The audit team verified personnel performing the referenced activities were appropriately trained and qualified.

The procedures reviewed and objective evidence assembled and evaluated during the audit substantiate that the applicable requirements for the training and qualification of personnel are adequate for compliance with the upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

### **5.2.4 Document and Record Control**

The audit team conducted interviews and reviewed implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address the CBFO QAPD requirements. The audit team reviewed procedures WP 15-RM, Rev. 6, *WIPP Records Management Program*, and WP 15-RM3002, Rev. 7, *Records Filing, Inventorying, Scheduling, and Dispositioning*. The results of the procedure reviews indicated that upper-tier requirements are adequately addressed.

Control of QA records was evaluated by observance of QA records stored in fire-rated cabinets in both Trailer 918B and the Safety Building, 2<sup>nd</sup> floor. Records storage requirements were evaluated by performing physical walk-down of QA records stored in fire-rated cabinets in both Trailer 918B and the Safety Building, 2<sup>nd</sup> floor.

The audit team also evaluated the VOC/Hydrogen/Methane Monitoring Program Records Inventory and Disposition Schedule dated 5/30/13.

The procedures reviewed and objective evidence assembled and evaluated during the audit substantiate that the applicable requirements for the control of documents and records are adequate for compliance with the upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

### **5.2.5 Volatile Organic Compound/Hydrogen/Methane Monitoring**

The audit team evaluated the adequacy, implementation, and effectiveness of NWP activities associated with VOC/Hydrogen/Methane Sampling and Reporting at the WIPP. Evaluation of these activities was performed based on review of implementing procedures and objective evidence (i.e., review of operating records, observations, and interviews of VOC/Hydrogen/Methane Monitoring personnel) in accordance with checklists based on the applicable NWP implementing procedures identified in the "Governing Documents" section of the CBFO A-14-06 Audit Plan.

The audit team verified VOC and Hydrogen/Methane (H-Me) sample canister sampling, handling, and use during a walk-through of the WIPP underground. The sampling team accessed the locked CONEX (ID #54-Z-117) in the WIPP. Entry into the CONEX was confirmed to be controlled and accessible only by the sampling and validation staff at the WIPP. The CONEX contained a series of appropriately locked filing cabinets and locker cabinets. The audit team examined one of the certified clean canisters (Canister A7339, Catalog 24174) which was located inside of a locked cabinet. The canister was found to be appropriately tagged, evacuated, and cleaned on 8/29/13. Upon arriving at the records facility in building 418 of the WIPP, the paperwork for the associated canister was reviewed to ensure documentation for the canister cleaning and evacuation (logged as entry A7339\_082913\_001) was performed correctly.

The audit team was escorted to the sampling sites in the underground at VOC A, VOC B, and Panel 3 Disposal Room. The sampling cabinets were appropriately locked and accessible only by VOC personnel. In VOC A, sample #8665 was in process of collection and was a six hour sample. In VOC B, there was no sample being taken at the time of the audit, yet canisters were present and awaiting radiation engineering to verify the filters taken from the sample lines were contamination-free. The audit team reviewed the logbooks within each cabinet, and the chain of custody records created for each canister in the locked cabinets. The audit team also observed the sampling lines and verified the sampling line paths to be in good condition. The disposal room Panel 3 path had historically been losing lines due to line disruptions. The line disruptions have been described as a closing artery over time. These closing lines are discussed in reports submitted to the NMED, the latest being documented on 10/16/2012.

Sample handling performance was verified by the audit team via reviews of underground chain of custody forms and batch data reports transmitted by the Carlsbad Environmental Monitoring and Research Center (CEMRC), the approved certified laboratory facility. The audit team discovered sample transfers are completed by the VOC/H-Me sampling team, and cleaned canisters are exchanged at the time of delivery to CEMRC. Sample integrity has been maintained throughout the times of sample

collection and analysis. No non-conforming conditions have been reported since the previous audit of this monitoring group.

Overall, the VOC and H-Me sampling, handling, and use procedures are adequate to the requirements of upper-tier documents. The procedures are effectively implemented to meet the program and plan requirements.

The audit team verified the VOC and H-Me operations' data generation, validation, and reporting. The team reviewed and verified the contents of VOC and H-Me batch data reports and their contents. The data packages provide all required information to meet the requirements of the monitoring plan and QA plan for each monitoring operation. The audit team reviewed and verified data packages and their associated laboratory raw data, which support and validate the QA requirements and reports for the WIPP validators.

Overall, the VOC and H-Me operations' data generation, validation, and reporting processes meet the requirements of the upper-tier documents. The VOC and H-Me procedures associated with the monitoring program are adequate to meet the requirements and are effective to acquire the desired results.

The audit team verified the data validation, verification, and reporting of data into the final data summary. The audit team reviewed and verified the results provided by the procured subcontracted laboratory (CEMRC), and the validation of the results as documented by the NWP VOC validators.

The audit team reviewed the following VOC data packages:

070813\_001      070813\_002      091913\_001      091913\_002

The audit team reviewed the following Hydrogen-Methane data packages:

070813\_001HM      091913\_002HM

The validation reports were reviewed and found to be complete. The documents include the QA and quality control results. The validators provide data calculation sheets that show the associated recovery data and instrument output. The checklist questions provide clear evidence of review to upper-tier document requirements through validation and review signature release.

The audit team also verified the results of the *Semi-Annual VOC, Hydrogen, and Methane Data Summary Report for Reporting Period January 1, 2013 through June 30, 2013*. The report includes all required data reported to the NMED. The report includes the results of the QA plan.

Overall, the data validation, verification, and reporting of data into final data summary meets the adequacy requirements for the air monitoring program. The procedures are

effective in meeting the desired results, and the procedures satisfy the upper-tier requirements of the VOC/Hydrogen-Methane air monitoring program at the WIPP.

Based on all the procedures reviewed and objective evidence assembled and evaluated during the audit, the applicable requirements for VOC/Hydrogen/Methane Monitoring activities are adequately established for compliance with the upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

## **6.0 CORRECTIVE ACTIONS, OBSERVATIONS, AND RECOMMENDATIONS**

### **6.1 Corrective Action Reports**

During the audit, the audit team may identify conditions adverse to quality (CAQs), according to the description below, and document such conditions on CARs.

*Condition Adverse to Quality (CAQ) – An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, nonconformances, and technical inadequacies.*

*Significant Condition Adverse to Quality – A condition which, if uncorrected, could have a serious effect on safety, operability, waste confinement, TRU waste site certification, regulatory compliance demonstration, or the effective implementation of the QA program.*

No CAQs necessitating the generation of CARs were identified as a result of this audit.

### **6.2 Deficiencies Corrected During the Audit**

During the audit, the audit team may identify CAQs. The audit team members and the Audit Team Leader (ATL) evaluate the CAQs to determine if they are significant. Once a determination is made that the CAQ is not significant, the audit team member, in conjunction with the ATL, determines if the CAQ is an isolated case requiring only remedial action and therefore can be corrected during the audit (CDA). Deficiencies that can be classified as CDA are those isolated deficiencies that do not require a root cause determination or actions to preclude recurrence, and those for which correction of the deficiency can be verified prior to the end of the audit.

Upon determination that the CAQ is isolated, the audit team member, in conjunction with the ATL, evaluates/verifies any objective evidence/actions submitted or taken by the audited organization and determines if the condition was corrected in an acceptable manner. Once it has been determined that the CAQ has been corrected, the ATL categorizes the condition as a CDA.

No deficiencies determined to be minor and isolated in nature were identified and corrected during the audit.

### **6.3 Observations**

During the audit, the audit team may identify potential problems that should be communicated to the audited organization. The audit team members, in conjunction with the ATL, evaluate these conditions and classify them as Observations using the following definition:

*Observation – A condition that, if left uncorrected, could result in a CAQ. Once a determination is made, the audit team member, in conjunction with the ATL, categorizes the condition appropriately.*

No Observations were identified during the audit.

### **6.4 Recommendations**

During the audit, the audit team may identify suggestions for improvement that should be communicated to the audited organization. The audit team members, in conjunction with the ATL, evaluate these conditions and classify them as Recommendations using the following definition:

*Recommendations – Suggestions that are directed toward identifying opportunities for improvement and enhancing methods of implementing requirements. Once a determination is made, the audit team member, in conjunction with the ATL, categorizes the condition appropriately.*

No Recommendations were identified during the audit.

### **7.0 LIST OF ATTACHMENTS**

- Attachment 1: Personnel Contacted During Audit A-14-06
- Attachment 2: NWP Procedures Evaluated During Audit A-14-06
- Attachment 3: Summary of Audit A-14-06 Results

| <b>PERSONNEL CONTACTED DURING AUDIT A-14-06</b> |                                   |                         |                               |                          |
|---|-----------------------------------|-------------------------|-------------------------------|--------------------------|
| <b>NAME</b>                                     | <b>ORGANIZATION / DEPARTMENT</b>  | <b>PREAUDIT MEETING</b> | <b>CONTACTED DURING AUDIT</b> | <b>POSTAUDIT MEETING</b> |
| Allen, Bill                                     | NWP/Quality Integration Manager   | X                       |                               | X                        |
| Boatwright, Wes                                 | RES/EM&H/VOC Program Manager      | X                       | X                             | X                        |
| Cannon, Val                                     | NWP/QA Assurance Programs Manager | X                       | X                             | X                        |
| Estrada, Leo                                    | NWP/WIPP Form Cord.               |                         | X                             |                          |
| Ganaway, David                                  | RES/EM&H/Env. Specialist          | X                       | X                             |                          |
| Garcia, Oscar                                   | NWP/VOC Tech                      | X                       |                               |                          |
| Hernandez, Lou                                  | NWP/Assoc. QA Analyst             |                         | X                             |                          |
| Hoff, Jon                                       | NWP/Quality Assurance Manager     | X                       |                               |                          |
| Ito, Fran                                       | NWP/Performance Assurance Manager |                         | X                             |                          |
| Ledford, Wayne                                  | NWP/QA Specialist                 | X                       |                               |                          |
| Lichty, Tom                                     | NWP/Technical Training            |                         | X                             |                          |
| Navarrete, Martin                               | CBFO/Sr. QA Specialist            | X                       |                               |                          |
| Punchios, Sheri                                 | NWP/Sr. Staff Administrator       | X                       |                               | X                        |
| Rodriguez, Pete                                 | NWP/QA Specialist                 |                         | X                             |                          |
| Salness, Rick                                   | RES/EM&H Manager                  | X                       |                               | X                        |

**NWP Procedures Evaluated During Audit A-14-06**

|    | <b>Document Number</b> | <b>Document Title</b>  | <b>Rev</b> |
|----|------------------------|--|------------|
| 1  | WP 12-VC.01            | <i>Volatile Organic Compound Monitoring Plan</i>                               | 11         |
| 2  | WP 12-VC.02            | <i>Quality Assurance Project Plan for Volatile Organic Compound Monitoring</i> | 13         |
| 3  | WP 12-VC.03            | <i>Hydrogen and Methane Monitoring Plan</i>                                    | 2          |
| 4  | WP 12-VC.04            | <i>Quality Assurance Project Plan for Hydrogen and Methane Monitoring</i>      | 3          |
| 5  | WP 12-VC1684           | <i>VOC Monitoring Group-Air Sampling Equipment Operations</i>                  | 9          |
| 6  | WP 12-VC1685           | <i>Subatmospheric and Pressurized Air Sampling in Passivated Canisters</i>     | 7          |
| 7  | WP 12-VC3209           | <i>VOC Monitoring Group-Data Handling and Program Reporting</i>                | 17         |
| 8  | WP 13-1                | <i>Nuclear Waste Partnership LLC Quality Assurance Program Description</i>     | 34         |
| 9  | WP 13-QA.04            | <i>Quality Assurance Department Administrative Program</i>                     | 20         |
| 10 | WP 14-TR.01            | <i>WIPP Training Program</i>   | 13         |
| 11 | WP 15-RM               | <i>WIPP Records Management Program</i>   | 6          |
| 12 | WP 15-RM3002           | <i>Records Filing, Inventorying, Scheduling, and Dispositioning</i>            | 7          |

**Summary of Audit A-14-06 Results**

| Documents                          | Concern Classification |      |     |     | QA Evaluation |                | Technical     |
|------------------------------------|------------------------|------|-----|-----|---------------|----------------|---------------|
|                                    | CARs                   | CDAs | Obs | Rec | Adequacy      | Implementation | Effectiveness |
| Audit Activity                     |                        |      |     |     | A             | S              | E             |
| Organization                       |                        |      |     |     | A             | S              | E             |
| Quality Assurance Program          |                        |      |     |     | A             | S              | E             |
| Personnel Training & Qualification |                        |      |     |     | A             | S              | E             |
| Document Control                   |                        |      |     |     | A             | S              | E             |
| Records                            |                        |      |     |     | A             | S              | E             |
| VOC/Hydrogen/Methane Monitoring    |                        |      |     |     | A             | S              | E             |
| <b>TOTALS</b>                      | 0                      | 0    | 0   | 0   | A             | S              | E             |

| Definitions       |  |                                |                      |
|-------------------|--|--------------------------------|----------------------|
| E = Effective     |  | CAR = Corrective Action Report | Rec = Recommendation |
| S = Satisfactory  |  | CDA = Corrected During Audit   | A = Adequate         |
| I = Indeterminate |  | NE = Not Effective             | NA = Not Adequate    |
| M = Marginal      |  | Obs = Observation              |                      |