1228828

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

15-AMRP-0088

FEB 24 2015

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Dear Ms. Hedges:

CERTIFICATION OF CLOSURE OF THE 1301-N/116-N-1 LIQUID WASTE DISPOSAL FACILITY

The U.S. Department of Energy Richland Operations Office (RL) has completed closure of the 1301-N Liquid Waste Disposal Facility (LWDF), including associated pipeline segments. In accordance with Washington Administrative Code (WAC) 173-303-610(6), RL is submitting the Owner/Operator and Co-Operator Certification of Closure (Enclosure 1) and independent registered engineers (PE) Certifications of Closure (Enclosures 2 through 4).

If you have any questions, please contact me or your staff may contact Ray Corey, Assistant Manager for the River and Plateau on (509) 373-9971.

Sincerely,

Stacy Charboneau

Stacy Charboneau
Manager

AMRP:JCC

Enclosures

cc: See page 2

cc w/enclosures:
S. L. Dahl-Crumpler, Ecology
S. L. Feaster, WCH (Enclosure 1 only)
N. M. Menard, Ecology
S. E. Parnell, WCH (Enclosure 1 only)
D. G. Saueressig, WCH (Enclosure 1 only)
S. M. Sax, WCH (Enclosure 1 only)
Administrative Record D-1-2
Environmental Portal

cc w/o enclosures:
G. Bohnee, NPT
R. Buck, Wanapum
L. C. Buelow, EPA
D. A. Faulk, EPA
S. Harris, CTUIR
S. Hudson, HAB
R. Jim, YN
K. Niles, ODOE
D. Rowland, YN

ENCLOSURE 1

OWNER/OPERATOR (DOE/RL) AND CO-OPERATOR (WCH) CERTIFICATION FORM

OWNER/OPERATOR
CLOSURE CERTIFICATION
FOR THE
1301-N LIQUID WASTE DISPOSAL FACILITY

We, the undersigned, hereby certify that the 1301-N Liquid Waste Disposal Facility (also known as 116-N-1) closure activities were performed in accordance with specifications contained within the approved *100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan*, as amended, and as contained in the Hanford Facility RCRA Permit.

Stacy L. Charboneau

Owner/Operator
Stacy L. Charboneau
U. S. Department of Energy
Richland Operations Office

2/24/15
Date

Co-Operator
Scott Sax
President and General Manager
Washington Closure Hanford, LLC

1/29/15
Date

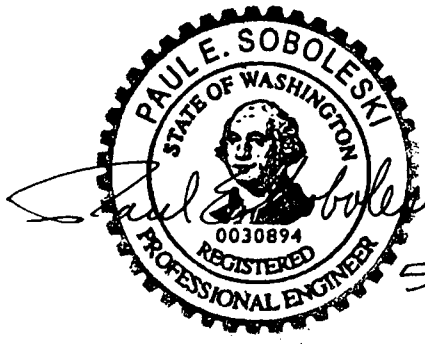
ENCLOSURE 2

PROFESSIONAL ENGINEER'S CERTIFICATION OF CLOSURE OF THE 1301-N (116-N-1) LWDF (1301-N CRIB AND TRENCH) AND ASSOCIATED CLOSURE CERTIFICATION REPORT

CERTIFICATION OF CLOSURE
OF THE
1301-N (116-N-1) LIQUID WASTE DISPOSAL FACILITY
(1301-N CRIB AND TRENCH)

As a registered professional engineer in the State of Washington, I certify that the 1301-N (116-N-1) Liquid Waste Disposal Facility has been closed out in accordance with the specifications contained in the Closure Plan. This certification is based upon my understanding of the closure requirements and specifications, a visit to the site to observe the closed condition, review of several daily progress reports which document the remediation activities, and review of the Cleanup Verification Package, which documents that the performance standards for closure have been achieved.

Furthermore, my review activities and certification have been an independent activity in accordance with *Washington Administrative Code* 173-303-610(6).



5/17/2012

Paul E. Soboleski

17 MAY 2012

Paul E. Soboleski, PE
State of Washington, License No. 30894
CH2M HILL, Inc.
295 Bradley Boulevard, Suite 300
Richland, WA 99352

Date

Independent Registered Professional Engineer's
Closure Certification Report for the
1301-N (116-N-1) Liquid Waste Disposal Facility
(1301-N Crib and Trench)

Introduction

This report was prepared to document the independent closure certification activities performed by Paul E. Soboleski, PE, of CH2M HILL, Inc.

This closure certification report addresses a single liquid waste disposal facility, known as the 1301-N (116-N-1) Crib and Trench, on the Hanford Nuclear Reservation site, which is a treatment, storage, and disposal (TSD) unit. The closure of this TSD unit is governed by five documents: 1) *100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan, (DOE-RL-2002a) (DOE/RL-96-39, Rev. 1A); 2) 100-NR-1 Interim Remedial Action Record of Decision (ROD, EPA 2000); 3) Sampling and Analysis Plan for the 100-NR-1 Treatment, Storage, and Disposal Units During Remediation and Closeout, (100-NR-1 SAP) (DOE/RL-2000-07); 4) 1301-N Liquid Waste Disposal Facilities, (WA7890008967, Part V, Closure Unit 2); and 5) Cleanup Verification Package for the Soil Column of the 116-N-1 Crib and Trench (CVP-2006-00004, Rev. 1).*

Closure certification is required by Washington Administrative Code (WAC) 173-303-610(6).

Background

As described in the Closure Plan (DOE-RL-2002), the 1301-N (116-N-1) unit, herein referred to as 1301-N, received radiologically contaminated liquid effluent from the 100-N reactor. The 1301-N crib was constructed in 1963 and began receiving N Reactor coolant water and waste products in 1965. In 1965, the crib was expanded by the construction of a "zigzag" trench approximately 1,600 feet in length to enhance percolation capacity. The 1301-N Crib and Trench were covered with bird screens supported by wooden poles to prevent wildlife from coming into contact with the waste liquids. The screens were replaced with precast concrete panels in 1982 by simply placing the panels on top of the existing poles and screens. The crib and trench operated in tandem until 1985, when the 116-N-3 Crib became the primary liquid waste disposal facility for the N Reactor. The 116-N-1 Crib and Trench were taken out of service at that time.

Planned Closure Activities

Chapter 4 of *1301-N Liquid Waste Disposal Facilities* (WA7890008967, Part V, Closure Unit 2) presents the closure plan for 1301-N. The planned activities include removal of structures and piping, evaluation of soil data, waste management, institutional controls, and site restoration.

Closure Activities Completed

Based upon one site visit, review of the *Cleanup Verification Package for the Soil Column of the 116-N-1 Crib and Trench* (CVP-2006-00004, Rev. 1) (CVP), review of selected Daily Reports and Weekly Project Meeting minutes (entire record unavailable), and discussion with project staff, the following closure activities have been completed in accordance with the closure plan:

- **Removal of Structures and Piping.** Overburden materials, debris, contaminated and uncontaminated concrete structures and piping, and the underlying contaminated soil were removed, beginning in April of 2002. Potentially clean overburden (based upon field screening) was placed in separate stockpile areas for potential use as backfill. In 2004, a landfill bridge was constructed over a portion of the trench using clean overburden stockpiled earlier. The land bridge was for a temporary road to access both sides of the trench. The land bridge excavation and overburden were sampled prior to backfilling the land bridge to ensure that the materials met the cleanup criteria. Approximately 25 feet of piping was removed between the crib and the 1315-N valve station during the excavation of the crib sidewall. Contaminated materials were disposed of at the Environmental Restoration Disposal Facility (ERDF). Approximately 333,528 metric tons (367,653 US tons) of material from the site was disposed of at ERDF by October of 2005.

- **Evaluation of Soil Data.** The site was excavated to a depth of approximately 6.5 m (21 feet) for the trench area and approximately 4.5 m (15 feet) for the crib area. The shallow zone for the crib and trench consisted of the excavation sidewalls to a depth of 4.5 m (15 feet) and the deep zone consisted of the excavation sidewalls below 4.6 m (15 feet) together with the floor of the excavation. The number of samples required was less than the default number of 10 randomly selected samples specified in the 100-NR-1 SAP. Therefore, ten shallow zone samples (<4.6 m [<15 feet] depth) were randomly collected from the crib, the trench, the excavation sidewalls, and the overburden. Ten deep zone samples (>4.6 m [>15 feet] depth) were collected from the excavation sidewalls and the floor of the excavation. Four samples were also collected from the land bridge for the shallow zone, and one was collected from the excavation prior to backfilling the land bridge. As described in the Cleanup Verification Package (CVP-2006-00004, Rev. 1), analysis and further evaluation of the contaminants showed that the Closure Plan performance standards were met through remediation.

- **Waste Management.** Demolition debris removed from 1301-N included solid wastes in the crib and trench; demolished concrete, wire cables, bird screens, and wooden poles; and pipe materials. The material was disposed of as contaminated waste in ERDF. Disposal waste manifests (container counts) were reviewed as part of this certification process and show proper disposal of the waste in accordance with the closure plan.

- **Institutional Controls.** Before March of 2012, the area formerly occupied by 1301-N was surrounded by chain link (cyclone) fencing at least 6 feet in height, with a few gates into the former crib and trench areas which were chained and locked. Entry into the former site of 1301-N was not permitted during the site visit by CH2M HILL personnel in January of 2012, and was not required for this certification effort. In early 2012, the fencing was removed as part of a Class 1 permit modification. The Washington State Department of Ecology approved the modification that perimeter fencing was no longer required as an institutional control.

- **Site Restoration.** The one site visit made under this certification effort confirmed that backfill and restoration of the site is complete. Restoration consisted of grading the site to generally match the surrounding topography, to include the addition of small rolling hills. Revegetation of the site is well under way, and plant life has taken hold and is extant, although it differs from the undisturbed surrounding native flora of the shrub-steppe environment.

- **Cleanup Verification Package.** Tables 3, 4, 5, and 6 of the CVP show that the sample results demonstrate closure performance standards and applicable cleanup levels have been met.

Conclusion

Based upon the review of the Cleanup Verification Package (CVP-2006-00004, Rev. 1), other project references, and a single site visit made by CH2M HILL personnel, it is concluded that the closure of the 1301-N Crib and Trench was completed in accordance with the approved closure plan *(100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan, (DOE-RL-2002a) (DOE/RL-96-39, Rev. 1A).* The closure plan concludes that that completed closure activities for 1301-N meet the soil closure performance standards and that the soils underlying these sites (crib, trench, and former land bridge) are verified to meet the cleanup levels and performance standards of the closure plan (DOE-RL-2002a, DOE/RL-96-39, Rev. 1A). The radiologically contaminated groundwater attributable to 1301-N remains above drinking water standards and is addressed through CERCLA in the 100-NR-1 and 100-NR-2 Operable Units Record of Decision.

References

1) *100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan,* (DOE-RL-2002a) (DOE/RL-96-39, Rev. 1A).

2) *100-NR-1 Interim Remedial Action Record of Decision* (ROD, EPA 2000).

3) *Sampling and Analysis Plan for the 100-NR-1 Treatment, Storage, and Disposal Units During Remediation and Closeout,* (100-NR-1 SAP) (DOE/RL-2000-07).

4) *1301-N Liquid Waste Disposal Facilities,* (WA7890008967, Part V, Closure Unit 2), Washington State Department of Ecology, March 31, 2005.

5) *Cleanup Verification Package for the Soil Column of the 116-N-1 Crib and Trench* (CVP-2006-00004, Rev. 1), Washington Closure Hanford, Richland, WA.

6) Various Daily Reports of Construction Activity and Weekly Project Progress Meeting Minutes.

7) Hanford Facility RCRA Permit Modification Notification Form, for 1301-N Liquid Waste Disposal Facility, Part V, Chapter 17, Attachment 41, Appendix A, Sections A.2.1.10 and A.4.1, December, 2001.

ENCLOSURE 3

PROFESSIONAL ENGINEER'S CERTIFICATION OF CLOSURE OF THE 1301-N LWDF WITH DEFERRED PIPELINE SEGMENT 100-N-63:2

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

CH2MHILL
Plateau Remediation Company

October 14, 2014

CHPRC-1404490

Mr. Scott M. Sax, President
Washington Closure Hanford, LLC
2620 Fermi Avenue
Richland, Washington 99354

Dear Mr. Sax:

CERTIFICATION OF CLOSURE OF THE 1301-N LIQUID WASTE DISPOSAL FACILITY DEFERRED PIPELINE SEGMENTS OF 100-N-63:2

References:

1. Document, the Hanford Facility Resource Conservation and Recovery Act of 1976 (RCRA) Permit, Number WA7 89000 8967, Revision 8C, dated April 29, 2014.

2. Document, Cleanup Verification Package (CVP) for the 100-N-63:2 Pipelines between 109N, 105N, 107N, 1310N, 1322N, 1926N, and 36" Process drain to Outfall, CVP-2013-00001, Revision 0, dated October 2013.

3. Document, Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for the 100-NR-1 Treatment, Storage, and Disposal Units, DOE/RL-2000-16, Revision 2, dated March 2001.

Please see the attached Certification of Closure of the 1301-N-Liquid Waste Disposal Facility Deferred Pipeline Segments of 100-N-63:2. This work was performed under WCH Work Order # CP4011.

I have worked closely with Daniel G. Saueressig of your office. You may contact me at (509)372-1684 with any questions regarding this matter.

Sincerely,

Jeffrey G. Riddelle
Manager, Soil and Groundwater Remediation Project
Design and Pump & Treat Engineering Process Data

jgr/bjd

Attachment

cc: ^CHPRC Correspondence
W. F. Barrett
D. G. Saueressig
K. L. Wiemelt

ATTACHMENT

CHPRC-1404490

CERTIFICATION OF CLOSURE OF THE 1301-N LIQUID WASTE DISPOSAL FACILITY WITH DEFERRED PIPELINE PIPELINE SEGMENT 100-N-63:2

J. G. Riddelle

Consisting of 6 pages,
including this cover page

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

CH2MHILL
Plateau Remediation Company

CERTIFICATION OF CLOSURE OF THE 1301-N LIQUID WASTE DISPOSAL FACILITY DEFERRED PIPELINE SEGMENTS OF 100-N-63:2

As a registered professional engineer in the State of Washington, I certify that the pipelines identified in the RCRA Permit number WA7 89000 8967 Revision 8C, Part V, Closure Unit 2, 1301-N Liquid Waste Disposal Facility, Chapter 2, Figure 2.1 and 2.2 have been closed in accordance with the RCRA permit. This certification is based on my understanding of the closure requirements, periodic visits to the site to witness closure activities, discussions of closure activities with the project staff, and review of the Permit requirements and the associated cleanup verification package. My review activities and certification have been an independent activity in accordance with *Washington Administrative Code* 173-303-610(6).

Jeffrey G. Riddelle
State of Washington, License No. 43237
2930 Redrock Ridge Loop
Richland Washington 99354

10/14/14
Date

10/14/14

CERTIFICATION OF CLOSURE OF THE 1301-N LIQUID WASTE DISPOSAL FACILITY WITH DEFERRED PIPELINE PIPELINE SEGMENT 100-N-63:2

References:

1. Document, the Hanford Facility Resource Conservation and Recovery Act of 1976 (RCRA) Permit, Number WA7 89000 8967, Revision 8C, dated April 29, 2014.

2. Document, Cleanup Verification Package (CVP) for the 100-N-63:2 Pipelines between 109N, 105N, 107N, 1310N, 1322N, 1926N, and 36" Process drain to Outfall, CVP-2013-00001, Revision 0, dated October 2013.

3. Document, Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for the 100-NR-1 Treatment, Storage, and Disposal Units, DOE/RL-2000-16, Revision 2, dated March 2001.

Background:

The closure for 1301-N as defined in RCRA Permit is being performed in several phases. At the time of this verification some sections of the closure are complete, and others are yet to be performed. This report was prepared to document independent, qualified, registered professional engineer certification of the closure of the deferred piping elements of the 100-N-63:2 waste subsite as described in the RCRA Permit Sections 4.2 "Piping removal or characterization as clean" and 4.3 "Sampling and Analysis Activities". A plan view of the piping and soil removal actions covered by this review are depicted in RCRA Permit Part V, Closure Unit 2, 1301-N Liquid Waste Disposal Facility, Chapter 2, Figure 2.1 and 2.2.

CERCLA actions, which included remediation of radiological contaminants, for the pipelines and soils were conducted concurrently, and are documented in the Cleanup Verification Package (CVP), but are not covered by this review. Backfill and revegetation are not complete at the time of this writing, therefore, completion of these elements are not included in this certification. The review was performed by Jeffrey G. Riddelle, Washington State PE # 43237.

Method of review:

The following was performed to verify that the closure activities were completed.

1) The cleanup levels specified in the Cleanup Verification Package were verified to contain the correct RAG's specified in the RCRA permit.
2) Site visits to ensure all piping required to be removed was completed, and sampling was performed in accordance with approved procedures.
3) Cleanup Verification Package reviews to ensure that analysis was performed to demonstrate compliance with the cleanup levels in the RCRA Permit.

CERTIFICATION OF CLOSURE OF THE 1301-N LIQUID WASTE DISPOSAL FACILITY WITH DEFERRED PIPELINE PIPELINE SEGMENT 100-N-63:2

Permit requirements review

As described in RCRA permit Section 4.2, *"The Remediation of 1301-N and 1325-N Liquid Waste Disposal Facilities includes the excavation and removal of the contaminated piping systems that have not been characterized and determined to be clean (i.e. contain no dangerous waste constituents above residential MTCA B concentrations)".*
"The buried pipelines will be unearthed by conventional excavation equipment. The exposed piping may be segmented for removal manually or by remote methods, depending on the contact radiation exposures. Contamination controls will focus on the drainage of residual fluids in the piping prior to, and during, segmentation and on the control of airborne contamination during cutting and pipe handling operations. After the piping has been removed, the pipe bedding soil will be surveyed for residual contamination, excavated, and disposed a necessary."

WCH did not exercise the option to sample piping systems to demonstrate that they were below MTCA B concentrations, (i.e. all piping was excavated and removed).

The Permit was reviewed to ensure that the required cleanup levels were carried forward into the Remedial Action Goals (RAGs). The RCRA permit requires cleanup to the MTCA B levels, The CVP RAG's were compared to MTCA B requirements. Two COPC's (arsenic and petroleum based contaminants) RAGs did not match MTCA B cleanup requirements. Alternatives to the MTCA B cleanup levels for these two COPC's were appropriately approved by regulatory agencies in both cases as described below.

Arsenic
The most stringent MTCA B cleanup level for arsenic is 0.667 mg/kg. The RAG listed in CVP Table 3 is 20 mg/kg, and the maximum arsenic result is listed as 7.1 mg/kg. The CVP states that modified arsenic remediation levels were raised to 20mg/kg due to historic pre-Hanford use of lead arsenate pesticides. Ecology agreement to raising the arsenic levels is documented in DOE/RL-2005-93, Remedial Design Report/Remedial Action Work Plan for the 100-N Area. (page 2-3).

Petroleum Based Contaminants
MTCA B identifies cleanup levels for several petroleum based contaminant MTCA B cleanup levels that were not attained. Even though MTCA B cleanup levels were not attained, closure of the site is approved by Ecology on the Waste Site Reclassification Form, identifying the petroleum contamination as being associated with a co-located site that "*will be addressed as part of the Shallow Petroleum-Only Releases (SPOR) 100-N-106 site remediation, as appropriate*".

Site Visits:

The following personnel were contacted during site visits:

Name	Title
Dan Saueressig	WCH 100 Area Field Remediation Environmental Project Lead
Jeff Walker	WCH 100-N Field Remediation Resident Engineer
Toni Faust	WCH 100-N Field Remediation Technical Support
Theresa Howell	WCH Sample Design & Cleanup Verification Supervisor
Donna Yasek	WCH Tri-Party Agreement Manager/DOE Liaison

Several site visits were made beginning on 10/4/2011 to observe piping removal and soil sampling.

I verified by inspection that all piping that was required to be removed per the RCRA Permit Part V, Closure Unit 2, 1301-N Liquid Waste Disposal Facility, Chapter 2, Figure 2.1 and 2.2, was removed. In order to gain confidence that the results of the sampling would provide a valid basis for the final verification of attaining cleanup levels, a sampling event on 12/4/12 was observed. The practices implemented were reviewed against work instruction 0100N-WI-G022. The observed sampling event was consistent with the requirements of Work Instruction 0100N – WI – G022.

Cleanup Verification Package Review:

The CVP, Table 3 and 4 summarizes the results of the Verification activity. Table 3 and 4 demonstrate that most of the sampling results met RAG's as required. For COPC's that did not meet the RAG's, the RDR/RAWP Appendix C, section C1 states" *For nonradioactive contaminants, the 100 times rule is applied first to determine concentrations that can remain in place without impacting groundwater. If residual contaminant concentration exceeds concentrations calculated using the 100 times rule, the RESidual RADioactivity (RESRAD) model can be used on a site-specific basis to determine if residual concentrations are protective.*"

RDR/RAWP Appendix C Section C3 states "*The RESRAD model is run with only the drinking water exposure pathway active (all other exposure pathways are suppressed). The graphical and numerical output for a 1,000-year time frame for the drinking water pathway are inspected (the RESRAD model can evaluate migration and decay of radionuclides for a 1,000-year time period). If the concentration of a soil contaminant in drinking water is zero at all times, the contaminant does not reach groundwater. If a soil contaminant at its residual concentration is shown not to reach groundwater, further remediation is not required.*"

The RESRAD model results demonstrate that for COPCs that do not meet the RAG's, the COPC's do not migrate to groundwater in a 1,000 year time frame, based on the minimum vadose zone thickness at the site of 9 m. Therefore the residual contamination levels are predicted to be protective of the groundwater and the Columbia River.

Direct exposure evaluations for Non-radionuclides are presented in Appendix D of the CVP. No COPC exceeded direct exposure RAGs.

WCH calculations are to be performed in accordance with WCH procedure ENG-1-4.5, "Project Calculations". In order to verify that the calculations were performed as required, a copy of ENG-1-4.5 was obtained. According to ENG-1-4.5, compliance to the procedure is required if "*The results of the calculation will be decisive in decisions involving safety, regulatory compliance, or milestone completion*", and if "*The calculation is used to develop deliverables to external customers or regulators*". Both of these criteria apply to calculations performed for purposes demonstrating compliance with the RCRA permit. All calculations reviewed were completed in compliance with ENG-1-4.5.

Groundwater/River protection for COPC's exceeding RAG's were evaluated through use of the RESRAD model. RESRAD software was confirmed as an active, verified software listed as active in WCH "Software Inventory Tracking System."

Conclusion:

Based on the review described above, contaminants of concern in the RCRA Permit were correctly established based on MTCA B cleanup requirements, (in two cases, alternatives were approved by regulators). The RDR/RAWP does allow for use of RESRAD modelling to demonstrate that contaminants do not migrate to groundwater in cases where RAGS are not met.

Base on the Site visits, all piping requiring removal per the Permit was removed, and sampling was performed in accordance with approved procedures

Based on Cleanup Verification Package review, calculations reviewed were performed appropriately, demonstrating permit COPC cleanup levels were achieved.

Therefore, I conclude that the deferred pipeline segments 100-N-63:2 of the 1301-N Liquid Waste Disposal Facility was closed in accordance with the requirements of the RCRA permit..

ENCLOSURE 4

PROFESSIONAL ENGINEER'S CERTIFICATION OF THE BACKFILL AND REVEGETATION OF THE 1301-N DEFERRED PIPELINE SEGMENTS

CERTIFICATION OF CLOSURE OF THE
1301-N piping (also referred to as the 100-N-63:2 waste site or 116-N-1)

As a registered professional engineer in the State of Washington, I certify the successful completion of the backfill and revegetation of the previously remediated 1301-N Resource Conservation and Recovery Act (RCRA) piping at 100-N (also referred to as piping associated with the 100-N-63:2 waste site or 116-N-1).

The certification is performed in accordance with the closure plan contained in the Hanford Facility RCRA Permit, Closure Unit 2, 1301-N Liquid Waste Disposal Facility, and all approved modifications to the Hanford Facility RCRA Permit for this unit.

This certification is based on my understanding of the closure requirements and specifications, visits to the site to witness the backfill and revegetation activity progress, and the discussions of closure progress with project staff that monitor daily activities and compliance with the approved closure plan. My review activities and certification have been an independent activity in accordance with *Washington Administrative Code* 173-303-610(6).

Sean A. Fargo
Registered Professional Engineer
State of Washington, License No.15769
4921 W. Margaret St.
Pasco, Washington 99301

January 20, 2015
Date