



1235895  
[0078330H]

MEETING NOTES

Waste Management Area C RCRA Facility Investigation Report

MEETING DATE: January 7, 2016

LOCATION: Washington State Department of Ecology Office, Richland, WA

ATTENDEES:

- |                         |                             |                          |
|-------------------------|-----------------------------|--------------------------|
| Alaa Aly (CHPRC/INTERA) | Damon Delistraty (Ecology)  | Paul Rutland (WRPS)      |
| Mike Barnes (Ecology)   | Andrea Hopkins (WRPS)       | Kristin Singleton (WRPS) |
| Ryan Beach (DOE-ORP)    | Mahmudur Rahman (INTERA)    | Maria Skorska (Ecology)  |
| Marcel Bergeron (WRPS)  | Julie Robertson (Freestone) | Cindy Tabor (WRPS)       |
| Joe Caggiano (Ecology)  | Beth Rochette (Ecology)     |                          |

**BACKGROUND INFORMATION:** The meeting was called to promote continued Ecology, EPA, DOE, and WRPS discussion about comments associated with and revision of RPP-RPT-58339, Rev. A Draft *Phase 2 RCRA Facility Investigation Report for Waste Management Area C* (WMA C RFI Report). The report was submitted to Ecology and EPA in December 2014 to meet *Hanford Federal Facility Agreement and Consent Order* (HFFACO) Milestone M-045-61. Ecology's February 23, 2015 response to the RFI report submittal (Letter 15-NWP-37) noted that holding "a recurring meeting to discuss statements, regulatory interpretations, and the process steps for obtaining an agreeable RFI/CMS process for WMA C Closure" would be beneficial. Lists of expectations, agreements, and actions (including the status of any actions) are documented in the meeting notes.

**PURPOSE OF MEETING:** Discuss select comments on the WMA C RFI Report and RPP-RPT-58297, Rev. 0, *Screening-Level Evaluation of Groundwater Monitoring Data Collected in the Vicinity of Waste Management Area C* (WMA C Groundwater Screening Report).

**STATUS OF PRIOR MEETING NOTES:** Ms. Robertson reported that notes from the November 18, 2015 meeting are in the HFFACO Administrative Record. There was no December 2015 meeting.

**DISCUSSION OF SELECT ECOLOGY COMMENTS ON WMA C RFI REPORT:** WRPS provided a hand-out (Attachment 1) of select Ecology comments from the July 7, 2015 letter (Letter 15-NWP-120) on Section 7 of the WMA C RFI Report and proposed responses.

- The attendees tentatively agreed to the proposed resolutions for the following comments from Dr. Delistraty, pending their incorporation into the revised WMA C RFI Report: 3, 4, 5, 7, 9, 10, 13, 14, 16, 17, 24, 26, 27, 29, 30, 36, 37, 43, and 44.
- The attendees tentatively agreed to the following changes to proposed resolutions, pending incorporation into the revised WMA C RFI Report:
  - Damon 6: There appears to be a disconnect between the WMA C RFI Report and the proposed response with respect to the number of analytes for which no toxicity values are available. The text/table will be updated to make them consistent throughout the document. Updates will be consistent with those required to respond to Dr. Delistraty's Comment 5 on *Baseline Risk Assessment for Waste Management Area C*, RPP-RPT-58329, Revision 0.
  - Related to Damon 6, Dr. Delistraty noted an apparent error on page 3-95 of the WMA C RFI Report. A reference made to Table 8-2 of *Evaluation of Phase 2 Characterization Data at Waste Management Area C* (RPP-RPT-57218, Rev. 0) should instead be to Table 8-1.
  - Damon 18: The text needs to clarify that a federal regulatory requirement rather than a state regulatory requirement drives evaluation of the youth trespasser scenario.

8

- Damon 21: Where the proposed response states that information will be added to "this report," Dr. Aly confirmed, at Dr. Delistraty's request, that the information will be added to the WMA C RFI Report (RPP-RPT-58339).
- Damon 31: The text will be modified to clarify discussion of the point of compliance at 15 ft below ground surface versus the active zone (the top 6 ft). Dr. Aly noted that data for the full 15 ft below ground surface will be used in the evaluation.

**DISCUSSION OF SELECT ECOLOGY COMMENTS ON WMA C Groundwater Screening Report:** Ms. Tabor acknowledged receipt of 17 comments from Ecology on this report. She stated that this report was developed to support the WMA C RFI Report because the 200-BP-5 and 200-PO-1 Remedial Investigation (RI) Reports were not completed by December 2014, when the WMA C RFI Report was submitted to Ecology. The 200-BP-5 and 200-PO-1 RI Reports, which contain groundwater risk assessment information and identify constituents from WMA C that are impacting groundwater, are now available and supersede the WMA C Groundwater Screening Report. The 200-BP-5 and 200-PO-1 RI Reports will be used to support the revision of the WMA C RFI Report in lieu of the WMA C Groundwater Screening Report, eliminating the need to revise the WMA C Groundwater Screening Report. Ms. Rochette expressed a concern that her comments would need to be addressed in whatever document would be used to support decisions on WMA C, and Mr. Beach took an action to share her comments with DOE-RL representatives for the 200-BP-5 and 200-PO-1 RI Reports.

**EXPECTATIONS, AGREEMENTS, AND ACTIONS:** Refer to the tables below.

**NEXT MEETING:** The next meeting was tentatively set for January 21, 2016.

Ryan E. Beach  
DOE Project Manager (print)

Jeffrey S. Lynn  
Ecology Project Manager (print)

Ryan E Beach  
DOE Project Manager (signature)

[Signature]  
Ecology Project Manager (signature)

2/16/16  
Date

2/16/16  
Date

DATE	AGREEMENTS
04/15/2015	<p>1. Regarding references in RPP-RPT-58339, Rev. A Draft <i>Phase 2 RCRA facility investigation Report for Waste Management Area C</i> to RPP-PLAN-37243 <i>Phase 2 RCRA Facility Investigation/Corrective Measures Study Master Work Plan for Single-Shell Tank Waste Management Areas</i>:</p> <ul style="list-style-type: none"> <li>• References in the draft RFI report are adequate as is and do not require modification.</li> <li>• The HFFACO milestone (M-045-58) associated with the Master Work Plan is complete.</li> <li>• It would be beneficial to continue discussion on the topics covered in the Master Work Plan.</li> </ul>

<b>ACTIONS</b>			
<b>Action Number</b>	<b>Actionee</b>	<b>Description</b>	<b>Status</b>
2015-08-26-1	Cindy Tabor	Evaluate whether internet links to reference documents can be added to the RFI report.	In progress.
2015-10-28-1	Mike Barnes	Ms. Tabor, Ms. Radloff, and Messrs. Barnes, Caggiano, and Bergeron will work together to clarify what groundwater technical information Ecology needs to see in the RFI report. The parties will also identify whether that information is in 200-BP-5 documents, and if so, where.	In progress. The parties have been meeting to discuss the action.
2015-10-28-2	Ryan Beach	Based on input from Action 2015-10-28-1, DOE-ORP and -RL will meet to discuss how the necessary groundwater information could be provided to Ecology.	In progress.
2015-10-28-3	Cindy Tabor	Regarding WMA C tank and soil inventory/leak information, WRPS/DOE will prepare a table with values to be used as the basis for corrective action decision making and will provide the basis information (e.g., reference documents) as footnotes/supporting information. Information in the table will be reviewed in a future meeting, the table incorporated into the meeting notes, and the notes entered into the HFFACO Administrative Record.	In progress. The soil inventory report (RPP-RPT-42294) is under revision.
2015-11-18	Alaa Aly	Review Ecology comment 15 on BRA (RPP-RPT-58329, Rev. 0) based on the discussion held 11/18/2015 and revise the proposed resolution as appropriate.	Completed 12/11/15 based on email from Dr. Delistraty accepting response proposed 11/18/2015 (Attachment 2). Closed 1/7/16.
2016-01-07-1	Cindy Tabor	Email to Ecology the compiled responses revised as a result of discussions held in these recurring meetings. Suggested Ecology recipients: Delistraty, Rochette, Lyon, Barnes, Yokel.	New.
2016-01-07-2	Ryan Beach	Provide Ecology comments on the WMA C Groundwater Screening Report (RPP-RPT-58297, Rev. 0) to DOE-RL representatives for the 200-BP-5 Operable Unit.	New.

Comment From (ECY)	Item	Page #/ section # Line #	Tied to Comment	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	3	P 7-1, S 7.0, L 24		The groundwater screening evaluation is in Section 7.7 (not 7.4).	Concur. Section 7 will be revised. The cross references within the section will be updated appropriately.	
Damon	4	P 7-5, S 7.1, L 1-8	Damon BRA 3	In addition to the MTCA point of compliance (POC) for direct contact, note that the MTCA POC for groundwater protection is throughout the vadose zone (surface to groundwater) (WAC 173-340-740[6][b]).	Concur. The following text will be added:  "The MTCA point of compliance (POC) for groundwater protection is throughout the vadose zone (ground surface to groundwater) (WAC 173-340-740[6][b]). Therefore, during the "protection of groundwater pathway" assessment, the sampling results for both shallow and deep vadose zone are evaluated."	
Damon	5	P 7-5, S 7.2, L 38		In general, HHRA (per EPA guidance) is broader than MTCA (WAC 173-340). For example, HHRA includes terrestrial foodchain pathways, whereas MTCA does not.	Concur. The following sentences will be included at the end of the paragraph:  It should be noted that some EPA exposure scenarios could include additional exposure pathways as compared to the pathways considered in the MTCA. The exposure pathways for each scenario are presented in subsection 7.2.2.1 of Draft A.	
Damon	6	P 7-6, S 7.2.1.1, L 18	Damon RFI 38, Beth 9, Damon BRA 5	Text describes one COPC exclusion criteria as, "Analytes without known toxicity data information." This exclusion should be described as an uncertainty. A recent editorial in Toxicol Sci notes, "Surprisingly, the current model deems that if we have no reliable toxicity data for a given chemical then it must be assumed to be safe. Although we may be blissfully ignorant of the toxicity this could indeed be very dangerous for the health of the human race and for the planet" (Miller, 2015) ( <a href="http://toxsci.oxfordjournals.org/content/early/2015/02/25/toxsci.kfu310.full.pdf">http://toxsci.oxfordjournals.org/content/early/2015/02/25/toxsci.kfu310.full.pdf</a> ).	Concur with the statement. Therefore the following text will be included to provide information related to analytes with no toxicity as a part of the uncertainty analysis:  "Human health risk assessment was performed for radionuclides, metals, VOC, SVOCs/PAHs and pesticides/herbicides. Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 10 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature. Only risk coefficients are available for their radiological isotopes, and were used when they were detected during radiological risk assessment. Among 2 VOCs, one has not been detected and the other, (m+p)-Xylene was detected in one sample out of 47 samples with a very low concentration (less than 1% of the screening values for the surrogate compounds). None of the SVOCs and pesticides were detected. Because of the lack of detection, those analytes will not contribute to the total risks. "	
Damon	7	P 7-6, S 7.2.2.1, L 41	Damon BRA 8	Text lists, "an environmental transport medium," as required for a complete exposure pathway. Note that this component is not needed for external radiation.	Concur. Lines 36-37 will be replaced as follows:  "Except for external gamma pathway, all of the following components must be present for a complete exposure pathway. An environmental transport medium is not required for external gamma pathway. "	

Comment From (ECY)	Item	Page #/ section # Line #	Tied to Comment	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	9	P 7-9, S 7.2.2.1, L 5		"(EPA 2012)" is not listed in the references in Section 9.	Concur. However, there is a more current reference. This current reference will be listed in this section and added to the reference section (Section 9).  OSWER Directive 9200.1-120, 2014, Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors" U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. Available at: <a href="http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf">http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf</a>	
Damon	10	P 7-9, S 7.2.2.1, L 26		"Inhalation of vapors and dust in ambient air" should be changed to "Inhalation of vapors and dust in ambient air, originating from soil."	Concur. Suggested text will be added in line 23 as follows:  "Inhalation of vapors and dust in ambient air, originating from soil"	
Damon	13	P 7-13, S 7.2.3.1, L 17-19	Damon BRA 25	According to OSWER 9285.7-53, all sources for toxicity values that are not Tier 1 or Tier 2 fall into Tier 3 by definition. Therefore, NCEA/RAIS comprise Tier 3 toxicity values.	Concur. The first sentence will be deleted. The second sentence will be modified as follows:  "The toxicity values for all chemicals found in The Risk Assessment Information System, Queried 10/2014, <a href="http://rais.ornl.gov/">http://rais.ornl.gov/</a> were considered during the toxicity assessment for this BRA."	
Damon	14	P 7-13, S 7.2.3.1, L 26-27		Units for risk coefficients for internal exposure are [risk/pCi].	Concur. Text changes will be made to correct the mistake.	
Damon	16	P 7-15, S 7.2.4.2, L 28-34; P 7-17, S 7.2.5.2, L 2-3	Damon BRA 46	The MTCA Method C standard for cumulative site risk is 1E-5 (not 1E-6).  Also, the text identifies two risk limits for nonrads for major risk contributors (1E-6 and 1E-7). Please clarify.	Concur. The following text changes will be made to correct the mistake:  The total ELCR for each EA is compared to the 2007 MTCA ("Human Health Risk Assessment Procedures" [WAC 173 340 708(5)]) cumulative risk threshold of $1 \times 10^{-5}$ . When the cumulative ELCR is greater than $1 \times 10^{-5}$ , individual analytes that report a cancer risk greater than $1 \times 10^{-5}$ are identified as risk contributors for the EA.  In addition, text changes will be made throughout the document to ensure that total ELCR limit for MTCA Method C is stated as 1E-5.	
Damon	17	P 7-17, S 7.2.5.2, L 4-5		Text notes that because As background ELCR (2E-6) was greater than or equal to As Exposure Area (EA) ELCRs, As was retained. However, As should be eliminated if background ELCR exceeds EA ELCR.	Lines 2-5 will be deleted. The following text will be added:  For nonradiological COPCs, the total ELCRs for all EAs were less than the 2007 MTCA ("Human Health Risk Assessment Procedures" [WAC 173 340 708(5)]) cumulative risk threshold of $1 \times 10^{-5}$ . Therefore, no non-radiological risk contributors were retained for further evaluation.	

Comment From (ECY)	Item	Page #/ section # Line #	Tied to Comment	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	18	P 7-20, S 7.2.5.6, L 14-15		WAC 173-340-745 applies to industrial soils but not to a "youth trespasser exposure scenario" (MTCA Method C exposure parameters are not compatible with intermittent exposure and a youth receptor).	The youth trespasser exposure scenario is one of six CERCLA scenarios identified to represent the range of receptors that could be exposed to COPCs in soil from WMA C. It was not evaluated as a part of WAC receptor scenario. Text changes will be made throughout the document to represent each receptor as either CERCLA or WAC receptor.	
Damon	21	P 7-26, S 7.2.6, L 4-7	Damon BRA 37	Clarify more specifically where evaluation of the groundwater protection pathway will be evaluated for rads.	Radiological COPCs in the vadose zone will be evaluated using vadose zone models developed in support of the WMA C Performance Assessment. The groundwater protection evaluation for the radiological contaminants will be added to this report.	
Damon	24	P 7-27, S 7.2.7, L 27		"(Cook 2003)" is not listed in the references in Section 9.	Concur. The reference will be added to Section 9.  Cook, Michael B., 2003, "Human Health Toxicity Values in Superfund Risk Assessments" (memorandum to Superfund National Policy Managers, Regions 1 – 10), OSWER Directive 9285.7 53, Office of Superfund Remediation and Technology Innovation, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C., December 5. Available at: <a href="http://www.epa.gov/oswer/riskassessment/pdf/hhmemo.pdf">http://www.epa.gov/oswer/riskassessment/pdf/hhmemo.pdf</a> .	
Damon	26	P 7-33, S 7.5.2.1, L 15-16		In addition to ingestion of soil and ingestion of food, Figure 7-4 also appropriately identifies complete pathways for "uptake by plants/soil biota" from shallow soil and standing water, as well as "external radiation" from shallow soil for all receptors.	Concur. Text changes will be made to include information shown in Figure 7-4. Birds and mammals experience chemical exposure through multiple pathways, including ingestion of abiotic media (surface water and sediment/soil) and biotic media (food). In addition, external radiation pathway was considered during the development of Tier 1 PRGs for radiological contaminants.	
Damon	27	P 7-33, S 7.5.2.2, L 22		"WMP-20570" is not listed in the references in Section 9.	Concur. The reference will be added to Section 9:  WMP-20570, 2006, Central Plateau Terrestrial Ecological Risk Assessment Data Quality Objectives Summary Report – Phase I, Rev. 0, Fluor Hanford, Inc., Richland, Washington.	
Damon	29	P 7-37, S 7.5.2.3, L 23-25		"Beresford et al 2008" is not listed in the references in Section 9.	Concur. The reference will be added to Section 9:  Beresford, N.A., C.L. Barnett, B.J. Howard, W.A. Scott, J.E. Brown, and D. Copplestone, 2008, "Derivation of Transfer Parameters for Use Within the ERICA Tool and the Default Concentration Ratios for Terrestrial Biota," J. Environ. Radiol. 99(9):1393–1407.	

Comment From (ECY)	Item	Page #/ section # Line #	Tied to Comment	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	30	P 7-42, S 7.5.5, L 43-46		List chemicals with detection limit > SSL. These specific chemicals should be identified as an uncertainty. Preferably, detection limits < SSL should be employed for all chemicals.	The last two lines of this paragraph will be replaced as follows:  A data review was performed to compare the result of the minimum detection limit for each analyte with respect to its corresponding ecological SSLs. It should be noted that the detection limit for analytes were based on 10% of their ecological SSLs for most cases. The results of the data review showed that the minimum detection limit and maximum reporting limit for all non-detect sample results did not exceed their corresponding ecological SSLs.	
Damon	31	P 7-43, S 7.5.5, L 9-10	Damon BRA 59	MTCA defines the biologically active soil zone as 0-6 ft (not 6-15 ft), per WAC 173-340-7490 (4)(a).	Concur. Per WAC 173-340-7490 (4)(a), the biologically active soil zone (a conditional point of compliance) is assumed to extend to a depth of six feet. Text will be corrected as follows:  WAC 173-340-7490(4)(a) identifies the biologically active zone extends to a depth of six feet.	
Damon	36	P 7-49, S 7.7.4, L 44	Damon BRA 2 - GWSC info to be replaced by BP-5 RI risk assessment info	Again, text refers to Section 7.3.2, but there is none.	Concur. Section 7 will be revised. The cross references within the section will be updated appropriately.	
Damon	37	P 7-50, S 7.7.4, L 1	Damon BRA 2 - GWSC info to be replaced by BP-5 RI risk assessment info	Text refers to Section 7.3.3, but there is none.	Concur. Section 7 will be revised. The cross references within the section will be updated appropriately.	
Damon	43	P 7-52, S 7.8.1, L 11-13		Text states that rad risk for the industrial worker is no greater than 2E-4, but Table 7-2 shows rad risk of 6E-4.	Concur. Text will be updated to show that the radiological risk for the industrial worker is 6E-4.	
Damon	44	P 7-52, S 7.8.1, L 22-24		Text states that rad risk for the adult resident ranged from 1E-3 to 7E-4, but Table 7-8 shows rad risk ranging from 2E-3 to 7E-6.	Concur. Text will be updated as follow:  Cancer risk associated with radionuclides range from $2 \times 10^{-3}$ to $7 \times 10^{-6}$ based on the adult residential exposure scenario.	

Attachment 2

December 18, 2015 Email from Ecology Accepting Proposed Response  
to Delistraty Comment #15 on WMA C RFI Report

**Julie Robertson**

---

**From:** Delistraty, Damon A. (ECY) <DDEL461@ECY.WA.GOV>  
**Sent:** Friday, December 11, 2015 10:46 AM  
**To:** Julie Robertson  
**Cc:** Rochette, Beth (ECY); Barnes, Michael (ECY)  
**Subject:** RE: Review of Draft November 18, 2015 Meeting Notes Regarding WMA C RFI Report

Hi Julie,

The meeting notes look fine. Re Comment #15 on dermal contact, after reconsideration, I concur with the USDOE response. That is, USDOE is only obligated to evaluate dermal exposure to petroleum mixtures for the industrial worker with MTCA Standard Method C (WAC 173-340-745[5][b][iii][B][III]). Only if USDOE were to modify MTCA Standard Method C (Equations 745-1 and 745-2), and obtain a higher resultant cleanup level, would USDOE be obligated to evaluate dermal exposure to hazardous substances other than petroleum mixtures for the industrial worker with MTCA Modified Method C (WAC 173-340-745[5][c][iii]). However, it should be noted that the Human Health Conceptual Exposure Model (Figure 3-1) should show the soil dermal contact pathway as complete for both the WAC resident and industrial worker (as appropriately specified in the meeting notes for Comment #12).

Damon

**From:** Julie Robertson [mailto:JulieRobertson@gofreestone.com]  
**Sent:** Tuesday, December 08, 2015 2:17 PM  
**To:** Barnes, Michael (ECY) <miba461@ECY.WA.GOV>; Delistraty, Damon A. (ECY) <DDEL461@ECY.WA.GOV>; Rochette, Beth (ECY) <Broc461@ECY.WA.GOV>; Skorska, Maria (ECY) <mako461@ECY.WA.GOV>  
**Cc:** Beach, Ryan E <Ryan\_E\_Beach@orp.doe.gov>; Jeremy\_M\_Johnson@orp.doe.gov; Parker, Dan L (Danny) <Danny\_L\_Parker@rl.gov>; Radloff, Anna W <Anna\_W\_Radloff@rl.gov>  
**Subject:** Review of Draft November 18, 2015 Meeting Notes Regarding WMA C RFI Report

Good afternoon. Attached for your review are the draft meeting notes from our November 18, 2015 meeting regarding the Draft Phase 2 RCRA Facility Investigation Report for WMA C (RPP-RPT-58339). Please review the attached notes and provide comments back to me by the close of business on Tuesday, December 15, 2015. Thank you.

Julie R. Robertson  
Senior Regulatory Specialist  
Freestone Environmental Services, Inc.  
1100 Jadwin Ave., Suite 250 • Richland, WA 99352  
Tel: 509.943.5222 • Fax: 509.943.5454 • Cell: 509.392.3523  
[www.gofreestone.com](http://www.gofreestone.com)

| REGULATORY PLANNING | FIELD DATA COLLECTION AND REPORTING |  
| SOIL AND GROUNDWATER REMEDIATION | RISK ASSESSMENT |  
| WATER RESOURCES |