



Glenn Springs Holdings, Inc.

A Subsidiary of Occidental Petroleum Corporation

Clint Babcock
Director Operations
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January 27, 2017

Reference No. 007843

Ms. Kerry Graber
Washington Department of Ecology
300 Desmond Drive
Olympia, WA 98504-7775

VIA EMAIL

Mr. Joe Wallace, Regional Project Manager/OSC
United States Environmental Protection Agency
Region 10 ECL-111
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Dear Ms. Graber and Mr. Wallace:

Re: Progress Report for October – December 2016
Administrative Order on Consent for Removal Activities
USEPA Docket No. 10-07-0011-CERCLA
Groundwater and Sediment Remediation
Commencement Bay Nearshore/Tideflats Superfund Site
Tacoma, Washington

This progress report is submitted pursuant to Section XII of the Administrative Order on Consent (AOC) for Removal Activities, Commencement Bay Nearshore/Tideflats (CB/NT) Superfund Site (EPA Docket No. 10-07-0011 CERCLA). This progress report summarizes the activities performed by Occidental Chemical Corporation ("Respondent") during the reporting period of October 1 through December 31, 2016.

As set forth in the AOC, this progress report is divided into the following subject areas:

- i) Description of Actions Taken During Reporting Period
- ii) Listing of New Sampling and Testing Reports Generated or Received
- iii) Summaries of New Deliverables
- iv) Description of Work Planned for Next Reporting Period
- v) Project Schedule and Estimates of Percentage of Work Completed
- vi) Discussion of Problems Encountered, Anticipated Problems or Delays, and Solutions to Address Problems or Delays

DESCRIPTION OF ACTIONS TAKEN DURING REPORTING PERIOD

GENERAL

- Submitted the progress report for the reporting period of July 1 through September 30, 2016 on October 31, 2016.
- Received Agency October 27, 2016 revisions to the draft Model Toxics Control Act (MTCA) Agreed Order (AO).
- The OCC and Agency Technical Teams participated in a November 29, 2016 conference call to discuss the draft MTCA AO.
- Submitted revisions to the draft MTCA AO on December 20, 2016.
- OCC and Ecology legal representatives exchanged emails on December 29 and 30, 2016 regarding the draft MTCA AO.

TASK A6 - PREPARE CHARACTERIZATION REPORT

- Received from Ecology on October 5, 2016, two October 1, 2016 memoranda by Ridolfi Environmental titled "Toxicity Information for Trichloroethylene (TCE), Tetrachloroethylene (PCE), and Vinyl Chloride" and "Review and Evaluation of Commencement Bay Fish Tissue Studies", that Ecology stated would be included as supporting documents to the Responsiveness Summary for the Site Characterization (Remedial Investigation [RI]) Report.
- Received Agency October 11, 2016 conditional approval of the RI Report submitted on August 29, 2015.
- The OCC and Agency Technical Teams participated in an October 19, 2016 meeting to discuss the 2016 porewater and sediment data.
- Submitted the porewater and sediment Data Summary Report on November 1, 2016.

TASK B4 - IMPLEMENT PH PILOT STUDY

- No actions taken during this period.

TASK C2/D2 - EVALUATE REMEDIAL ALTERNATIVES

- Submitted MS Word file of the June 2016 FS Report text on October 5, 2016.
- Received Agency October 11, 2016 description of their preferred remedy for discussion.
- The OCC and Agency Technical Teams participated in an October 12, 2016 conference call to discuss revisions to the FS Report.
- Received an October 12, 2016 email from Keta Waters containing results of computer simulations developed to evaluate mass removal rates for remedial alternatives.
- Submitted a list of questions regarding the Agency Technical Team's description of their preferred remedy and computer simulations on October 18, 2016.
- The OCC and Agency Technical Teams participated in October 19 and November 8, 2016 meetings to discuss revisions to the FS Report.
- Submitted revisions to the FS Report Table of Contents on November 10, 2016.

- Received Agency November 15, 2016 response to the November 10, 2016 revised FS Report Table of Contents.
- The OCC and Agency Technical Teams participated in a November 29, 2016 conference call to discuss revisions to the FS Report.
- Submitted proposed performance objective for CVOC mass removal on December 2, 2016.
- Submitted DCA tables, draft FS Fact Sheet, and revised FS Report on December 9, 2016.
- Received Agency December 14, 2016 feedback regarding OCC's December 2, 2016 proposed performance objective for CVOC mass removal.
- Received Agency December 15, 2016 comments on the December 9, 2016 draft FS Report.
- The University of Washington (UW) continued geochemical analyses as requested by the Agencies.

TASK E2 - 3D MODEL CONSTRUCTION AND CALIBRATION

- No actions taken during this period.

TASK M2 - RISK ASSESSMENT

- No actions taken during this period.

INTERIM MEASURES

- No actions taken during this period.

LISTING OF NEW SAMPLING AND TESTING REPORTS GENERATED OR RECEIVED

- See the new deliverables below.

SUMMARIES OF NEW DELIVERABLES

GENERAL

- Submitted the progress report for the reporting period of July 1 through September 30, 2016 on October 31, 2016.
- Submitted revisions to the draft MTCA AO on December 20, 2016.

TASK A6 – PREPARE CHARACTERIZATION REPORT

- Submitted the porewater and sediment Data Summary Report on November 1, 2016.

TASK B4 – IMPLEMENT PH PILOT STUDY

- No new deliverables during this period.

TASK C2/D2 - EVALUATE REMEDIAL ALTERNATIVES

- Submitted DCA tables, draft FS Fact Sheet, and revised FS Report on December 9, 2016.

TASK E2 – 3D MODEL CONSTRUCTION AND CALIBRATION

- No new deliverables during this period.

TASK M2 – RISK ASSESSMENT

- No new deliverables during this period.

INTERIM MEASURES

- No new deliverables during this period.

DESCRIPTION OF WORK PLANNED FOR NEXT REPORTING PERIOD

GENERAL

- Comply with various requirements of the AOC.
- Submit the progress report for the reporting period of January 1 through March 31, 2017 by April 30, 2017.
- Continue conference calls and face-to-face meetings with Agencies, as needed.
- Participate in a January 12, 2017 meeting with stakeholders.
- Continue development of the MTCA AO.

TASK A6 – PREPARE CHARACTERIZATION REPORT

- Receive Agency approval of the revised draft Vapor Intrusion (VI) Investigation Report submitted on March 17, 2016.

TASK B4 – IMPLEMENT PH PILOT STUDY

- No work planned during the period.

TASK C2/D2 - EVALUATE REMEDIAL ALTERNATIVES

- Complete the work by UW and submit the final report.
- Finalize the FS Report.
- Participate in a March 8, 2017 public meeting for the FS Report.

TASK E2 – 3D MODEL CONSTRUCTION AND CALIBRATION

- No work planned during the period.

TASK M2 – RISK ASSESSMENT

- No work planned during the period.

INTERIM MEASURES

- No work planned during the period.

PROJECT SCHEDULE AND ESTIMATES OF PERCENTAGE OF WORK COMPLETED

- The current status of major ongoing items is summarized below.

Task	Estimated Completion Schedule
FS Report Finalization	January 2017
MTCA AO Finalization	February 2017
FS Report Public Meeting	March 8, 2017
FS Approval	TBD
Cleanup Action Plan	TBD

- Table 1 presents the current status of the SOW deliverables.

DISCUSSION OF PROBLEMS ENCOUNTERED, ANTICIPATED PROBLEMS OR DELAYS, AND SOLUTIONS TO ADDRESS PROBLEMS OR DELAYS

No problems or delays are currently anticipated.

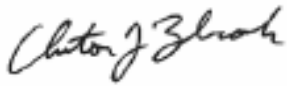
January 27, 2017

Reference No. 007843

If you have any questions regarding this progress report, please contact us at (972) 687-7506 or (519) 884-0510, respectively.

Yours truly,

Glenn Springs Holdings, Inc.



Clinton J. Babcock
Director Operations
Glenn Springs Holdings, Inc.
(for Respondent)



Ian K. Richardson P.E.
Project Manager
GHD
(for the Supervising Contractor)

CJB/IKR/kf/1
Encl.

cc: Kevin Rochlin, USEPA
Dominic Giardrone, CDM Smith
T. Li, Groundwater Solutions
J. Massmann, Keta Waters
R. Taylor, NOAA
T. Yackulic, Esq., USEPA
S. Leja, Ecology

R. Bakemeier, Esq.
F. Parigi., GSH
R. Healy, Port of Tacoma
M. Malott, CHB
B. Sullivan, Puyallup Tribe
C. Naylor, Puyallup Tribe

Table 1

**Status of SOW Deliverables
Groundwater and Sediment Remediation
as of December 31, 2016**

Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
<u>Prepare/Finalize Statement of Work (SOW)</u>				
	Draft Work Plan	23-Dec-03	2-Feb-04	-
	Draft Work Plan (revised)	31-Mar-04	26-Apr-04	-
	Draft SOW	18-May-04	21-Jul-04	-
	Draft SOW (revised)	3-Sep-04	18-Oct-04	
	Draft SOW (redline for meeting)	26-Oct-04	28-Oct-04	
	Draft SOW (revised redline)	5-Nov-04	23-Nov-04	
	Additional Agency Revisions (following discussions)	-	29-Dec-04	
	Draft SOW (revised redline)	7-Jan-05	13-Jan-05	
	Final SOW	17-Jan-05	-	
	Final SOW (corrected)	28-Jan-05	-	
	AOC Amendment Executed	-	-	1-Feb-05
Task A - Site Characterization				
A3 <u>Perform Supplemental Field Investigations</u>				
	SAP/QAPP	23-Dec-03	2-Feb-04	-
	SAP/QAPP (revised)	31-Mar-04	26-Apr-04	
	SAP/QAPP (revised)	17-May-04	-	28-May-04
	SAP/QAPP (final)	21-Jun-04	-	-
	Memo - Delineation of Northern Extent of Groundwater COC Plume	15-Jun-04	18-Jun-04	-
	Letter - Preliminary Appendix IX Analytical Results	28-Jun-04	-	21-Jul-04
	Draft SAP/QAPP for Additional Supplemental Investigations	9-Feb-05	10-Mar-05	
	Revised Draft SAP/QAPP for Additional Supplemental Investigations	14-Apr-05	-	25-Oct-05
	Partial Approval of SAP/QAPP for Additional Supplemental Investigations	-	-	23-May-05
	Partial Approval of SAP/QAPP for Additional Supplemental Investigations	-	-	8-Jun-05
	Conditional Approval of SAP/QAPP for Additional Supplemental Investigations	-	-	25-Oct-06
	Final SAP/QAPP for Additional Supplemental Investigations		-	
<u>709/721 Alexander Investigation</u>				
	Draft Work Plan - 709/721 Alexander Investigation	25-May-04	10-Jun-04	-
	Draft Work Plan - 709/721 Alexander Investigation (revised)	18-Jun-04	-	26-Jul-04
<u>Focused Investigation of CDD/F and PCBs</u>				
	PCDD, PCDF, and PCB Congener Characterization Analytical Results	15-May-06	1-Sep-06	
	Draft SAP/QAPP for Focused Investigation of PCDD/F and PCBs	5-Oct-06	30-Oct-06	-
	Final SAP/QAPP for Focused Investigation of PCDD/F and PCBs	20-Nov-06	-	8-Jan-07

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Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Received by OCC	Comments Date Approval Received by OCC
A4/A5 <u>Subtidal/Hydraulic Investigation</u>				
	Scope of Work (by USEPA/Ecology)	-	21-Oct-04	
	Preliminary Scope of Subtidal/Upland Investigations	10-Nov-04	29-Dec-04	
	Draft SAP/QAPP for Subtidal/Hydraulic Investigation	11-Feb-05	13-Apr-05	
	Revised Draft SAP/QAPP for Subtidal/Hydraulic Investigation	6-May-05	-	20-May-05
	Final SAP/QAPP for Subtidal/Hydraulic Investigation	23-Jun-05	-	-
<u>Geophysical Investigation</u>				
	Draft Scope of Work for Geophysical Investigation	5-Apr-06	5-Apr-06	
	Finalized Scope of Work for Geophysical Investigation	11-Apr-06	-	-
A6 <u>Prepare Characterization Report</u>				
	Letter - Interim GW Analytical Data Summary - 709/721 Alexander Investigation	18-Aug-04	25-Aug-04	
	Draft Geophysical Investigation Report	15-Jun-06	24-Jul-06	
	Final Geophysical Investigation Report	1-Dec-06	-	(a)
	Draft Seepage Meter Monitoring Report (CMA)	5-Dec-06	20-Apr-07	
	Preliminary PCDD/F and PCB Data Report	6-Jun-07	-	
	Preliminary PCDD/F and PCB Data Report (updated)	13-Aug-07	-	
<u>Hydrogeologic Characterization</u>				
<u>Interim Deliverable 3.1 - Confirmation of Groundwater Recovery Following Shutdown of Extraction Wells</u>				
	Initial Draft	6-Jul-06	13-Jul-06	
	Revision 1	19-Jul-06	21-Jul-07	
	Final Draft	30-Aug-07	-	(a)
<u>Interim Deliverable 4.1 - Procedure for Computing Average Pressure for 72-Hour Event</u>				
	Initial Draft	6-Jul-06	13-Jul-06	
	Revision 1	19-Jul-06	21-Jul-07	
	Final Draft	30-Aug-07	-	(a)
<u>Interim Deliverable 4.2 - Methodology Presentation</u>				
	Initial Draft	28-Jul-06	3-Aug-06	
	Revision 1	6-Sep-06	19-Sep-07	
	Final Draft	23-Oct-06	-	(a)
<u>Interim Deliverable 4.3 - Final Conductivity vs. Specific Gravity Relationship</u>				
	Initial Draft	4-Oct-06	5-Oct-07	
	Revision 1	13-Oct-06	17-Oct-06	
	Final Draft	19-Oct-06	-	(a)
<u>Interim Deliverable 4.4 - Presentation of Adjusted Pressure Transducer Data</u>				
	Initial Draft	8-Nov-06	15-Nov-06	
	Revision 1	30-Jan-07	28-Feb-07	
	Final Draft	15-Jun-07	-	(a)

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Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
<u>Interim Deliverable 4.5</u> - Density Distribution				
	Initial Draft	2-Nov-06	3-Nov-06	
	Revision 1	8-Nov-06	16-Nov-06	
	Final Draft	5-Dec-06	-	
	Final Draft - Revision 1	13-Mar-07	15-Mar-07	
	Final Draft - Final	19-Mar-07	-	(a)
<u>Interim Deliverable 4.6</u> - Presentation of Hydraulic Data from 709/721 Alexander Investigation				
	Initial Draft	22-Feb-07	22-Mar-07	
	Revision 1	29-Mar-07	10-Apr-07	
	Final Draft	11-Apr-07	-	(a)
<u>Interim Deliverable 6.1</u> - Calculation of FEH and ENV				
	Initial Draft	4-Aug-06	10-Aug-06	
	Revision 1	17-Aug-06	31-Aug-06	
	Revision 2	8-Sep-06	17-Oct-07	
	Final Draft	24-Oct-06	-	(a)
<u>Interim Deliverable 6.1a</u> - Calculation of Gradients from FEHs and ENVs				
	Initial Draft	19-Oct-06	19-Oct-06	
	Revision 1	26-Oct-06	16-Nov-06	
	Final Draft	4-Jan-07	-	(a)
<u>Interim Deliverable 6.2</u> - Presentation of FEH and ENV (Events 1 & 2)				
	Initial Draft	11-Dec-06	13-Dec-06	
	Revision 1	30-Jan-07	23-Mar-07	
	Revision 2	10-May-07	14-Jun-07	
	Final Draft	15-Jun-07	-	(a)
<u>Interim Deliverable 6.2a</u> - Re-Assessment of FEHs for Subtidal Transducers				
	Initial Draft	12-Jan-09	22-Jan-09	
	Final Draft	TBD		
<u>Interim Deliverable 6.3</u> - Transient Analysis of Groundwater Flow Vectors				
	Initial Draft	21-May-07	5-Jun-07	
	Final Draft	31-Oct-07		(a)
<u>Interim Deliverable 7.1</u> - Preliminary Characterization of Site Natural Attenuation				
	Initial Draft	25-Jan-07	31-Jan-07	
	Revision 1	13-Feb-07	28-Feb-07	
	Final Draft	22-Mar-07	-	(a)

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Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
<u>Interim Deliverable 8.2</u> - Presentation of Draft Conceptual Hydrogeologic Model				
	Initial Draft	25-Sep-07	4-Oct-07	
	Revision 1	23-Oct-07	1-Nov-07	
	Revision 2	20-Nov-07	27-Dec-07	
	Final Draft	18-Jan-08	-	(a)
<u>Assessment of Former Production Well</u>				
	Memorandum - Former Production Well Investigation Work Plan - Additional Production Well Investigation - Existing Well Geochemical Evaluation (Phase I)	3-Dec-09	28-Jan-10	
	Draft	17-Feb-10	5-Mar-10	
	Final	11-Mar-10	-	16-Mar-10
	Phase I Data Report	29-Apr-10	-	-
	Work Plan - Additional Production Well Investigation - Phase II			
	Draft	29-Mar-10	12-Apr-10	
	Revised Draft	30-Apr-10	12-May-10	
	Final	18-May-10	-	20-May-10
<u>Production Well Investigation Report</u>				
	Draft Production Well Investigation Report	15-Oct-10	10-Jun-11	
	Revised Draft Production Well Investigation Report	5-Jul-11	11-Aug-11	
	Revised Draft Production Well Investigation Report	31-Aug-11	-	6-Jan-12
<u>Assessment of Stratigraphy</u>				
	Stratigraphic Pick Table and Glacial Till Figures/Tables	7-Oct-09	-	
	Revised Site Stratigraphic Model	7-Dec-09	-	10-Dec-09
<u>Assessment of Geochemical Data</u>				
	Geochemical Evaluation (Data Figures)	7-Apr-10	-	-
<u>Groundwater Density Distribution Report</u>				
	Revised Groundwater Density Distribution Memorandum	17-Feb-10	24-Mar-10	
	Draft Final Groundwater Density Distribution Report	12-May-10	10-Jun-11	
	Revised Draft Final Groundwater Density Distribution Report	12-Jul-11	23-Sep-11	
	Revised Draft Final Groundwater Density Distribution Report	7-Nov-11	22-Dec-11	
	Interim Deliverable Groundwater Density Distribution (Draft)	12-Jan-12	30-Jan-12	
	Interim Deliverable Groundwater Density Distribution (Draft)	14-Feb-12		23-Apr-12

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Groundwater and Sediment Remediation
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Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
<u>Assessment of Data Gaps</u>				
	Examples of 3D EVS Visualizations and 2D Data Figures	29-Sep-10	17-Mar-11	
	Revised 3D Visualizations and 2D Data Figures			
	Groundwater 4DIMS - Group 1, 2 (part 1), 3	31-Mar-11	-	-
	Groundwater 4DIMS - Group 2 (part 2)	5-Apr-11	-	-
	Soil 4DIMS - Group 1, 2 (part 1)	8-Apr-11	-	-
	Soil 4DIMS - Group 2 (part 2), 3	12-Apr-11	-	-
	2D Data Figures (Google Earth) and Cross-Sections	29-Apr-11	-	-
	709/721 Data Summary Report	29-Oct-11	23-Dec-11	
	Evaluation of Potential DNAPL Source Areas	Nov/Dec-11	Nov/Dec-11	
	709/721 Data Summary Report	27-Jan-12	4-Apr-12	
	709/721 Data Summary Report	11-Apr-12	4-Sep-12	
	709/721 Data Summary Report	12-Sep-12		28-Sep-12
	Need for Step-Out Borings - DNAPL and LNAPL Source Areas	6-Dec-12	7-Feb-13; 22-Mar-13	
<u>Data Gap Evaluation Report</u>				
	Draft Data Gap Evaluation for Site Characterization	11-Apr-11	1-Aug-11; 20, 22, 23-Sep-11; 28-Oct-11	
	Draft Data Gap Evaluation for Site Characterization	5-Dec-11	1-Feb-12; 17-Feb-12	
	Draft Data Gap Evaluation for Site Characterization	5-Mar-12	16-Mar-12	
	Draft Data Gap Evaluation for Site Characterization	27-Mar-12	4-Apr-12	
<u>Comprehensive Supplemental Investigation (CSI) Work Plan</u>				
	Preliminary Draft Work Plan for Monitoring Event 3	28-Jul-11	23-Sep-11	
	Monitoring Event 3 - Work Plan for Additional Monitoring Well Installation and Data Collection	21-Oct-11	-	
	Draft CSI Work Plan	5-Dec-11	23-Dec-11	
	Draft CSI Work Plan - Advanced Well Installation	17-Jan-12	1-Feb-12; 17-Feb-12	
	Draft CSI Work Plan	5-Mar-12	16-Mar-12	
	Draft CSI Work Plan	27-Mar-12	4-Apr-12	
	CSI Work Plan	11-Apr-12	16-Apr-12	
	CSI Work Plan QAPP	14-May-12	29-Jun-12	
	CSI Work Plan QAPP	20-Jul-12	25-Jul-12	
	CSI Work Plan QAPP	26-Jul-12		26-Jul-12
<u>Updated Conceptual Site Model</u>				
	Conceptual Site Model Report	14-Mar-13	13-May-13	
	Revised Conceptual Site Model Report	30-Sep-13	22-Nov-13; 6-Dec-13	
	Revised Conceptual Site Model Report	17-Jan-14	24-Feb-14	
	Revised Conceptual Site Model Report	24-Mar-14		10-Apr-14
	Final Conceptual Site Model Report	16-Apr-14		

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**Status of SOW Deliverables
Groundwater and Sediment Remediation
as of December 31, 2016**

Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
<u>Sediment and Porewater Investigation</u>				
	Sediment Conceptual Site Model Technical Memorandum	9-Mar-15		
	Sampling and Quality Assurance Project Plan	4-Sep-15	4-Feb-16	
	Revised Sampling and Quality Assurance Project Plan	17-Mar-16	23-May-16	
	Data Summary Report	1-Nov-16		
<u>Site Characterization Report</u>				
	Preliminary Draft Site Characterization Report	31-Mar-08	13-Nov-08	
	Draft Site Characterization Report	7-Jul-08	-	
	Updated Draft Site Characterization Report	11-Apr-11	-	
	Draft Comprehensive Site Characterization Report	5-Aug-14		1-May-15; 24-Sept-15
	Revised Site Characterization Report	29-Aug-15		11-Oct-16
<u>Vapor Investigation</u>				
	Draft Soil Vapor Evaluation Work Plan	26-Oct-11	29-Nov-11	
	Vapor Investigation Work Plan	14-Dec-12	24-Jan-13	
	Vapor Investigation Work Plan	14-Feb-13		22-Feb-13
	Vapor Investigation Work Plan - Addendum	14-Mar-13		
	Vapor Investigation Report	4-Jun-13	19-Jul-13	
	Vapor Investigation Report	30-Aug-13	22-Nov-13	
	Revised Vapor Investigation Report and Work Plan Addendum	17-Dec-13	23-Jan-14; 3-Mar-14	
	Revised Vapor Investigation Work Plan Addendum	5-Mar-14		6-Mar-14
	Final Vapor Investigation Work Plan Addendum	12-Mar-14; 8-Apr-15		
	Vapor Investigation Report	22-May-14		
	Revised Vapor Investigation Report	17-Mar-16	TBD	
Task B - pH Source Control				
B1	<u>Finalize Rapid pH Assessment Report</u>			
	Draft Rapid pH Assessment Report	12-May-04	11-Jun-04	
	Draft Rapid pH Assessment Report (revised)	2-Jul-04	-	22-Sep-05
	Final Rapid pH Assessment Report	-	-	
B2	<u>Treatability Study</u>			
	Treatability Study Report	7-Jun-04	26-Jul-04	
	Final Treatability Study Report	9-Aug-04	-	18-Oct-04
B3	<u>Prepare Work Plan for pH Pilot Study</u>			
	Draft Work Plan for pH Pilot Study	8-Feb-05	14-Mar-05	
	Revised Draft Work Plan for pH Pilot Study	18-Apr-05	-	20-Jun-05
	OCC Requests Clarification of One (1) Condition for Approval	28-Jun-05	29-Aug-05	
	Final Work Plan for pH Pilot Study	-	-	-
B4	<u>Implement pH Pilot Study</u>			
	<u>Phase II</u>			
	Draft Work Plan for Phase II	11-Sep-08	25-Sep-08	
	Revised Draft Work Plan for Phase II	2-Oct-08	-	14-Nov-08
	Final Work Plan for Phase II	Dec-09	-	
	Preliminary Data Report for Phase II	17-Mar-09	7-Apr-09	

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Groundwater and Sediment Remediation
as of December 31, 2016**

Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Received by OCC	Date Comments Received by OCC
<u>Phase III</u>				
	Draft Work Plan for Phase III	20-Nov-08	3-Dec-08	
	Draft Work Plan for Phase III (redline)	11-Dec-08	-	18-Dec-08
	Final Work Plan for Phase III	20-Jan-09	-	
	Preliminary Data Report for Phase III	17-Feb-10	-	-
<u>pH Pilot Study Report</u>				
	Draft pH Pilot Study Report	10-Jun-08	7-Jul-08	
	Revised Draft pH Pilot Study Report	13-Jan-11	6-Nov-13	
Task C/D - Groundwater/Sediment Remediation				
C1 <u>Evaluate Existing Containment/Treatment System</u>				
<u>Work Plan for Evaluation of Existing Containment and Treatment System</u>				
	Draft Work Plan for Evaluation of Existing Containment and Treatment	9-Dec-11	4-May-12	
<u>Engineering Evaluation</u>				
	Draft Engineering Evaluation Work Plan for Existing Groundwater Containment and Treatment Systems	24-May-12	30-Jul-12	
	Draft Engineering Evaluation Work Plan for Existing Groundwater Containment and Treatment Systems	21-Aug-12	28-Sep-12	
	Draft Engineering Evaluation Work Plan for Existing Groundwater Containment and Treatment Systems	19-Oct-12	8-Nov-12	
	Draft Engineering Evaluation Work Plan for Existing Groundwater Containment and Treatment Systems	14-Nov-12		16-Nov-12
	Final Engineering Evaluation Work Plan for Existing Groundwater Containment and Treatment Systems	30-Nov-12	-	
	Engineering Evaluation Report	5-Feb-13		25-Mar-13
<u>Capture Zone Analysis</u>				
	Draft Capture Zone Analysis Conceptual Approach	20-Jun-12	30-Aug-12	
	Draft Capture Zone Analysis Conceptual Approach	24-Sep-12	15-Nov-12	
	Revised Capture Zone Analysis Conceptual Approach	28-Nov-12		8-Feb-13
C2/D2 <u>Evaluate Groundwater/Sediment Remedial Alternatives</u>				
<u>Preliminary Evaluation of Potential Remedial Technologies</u>				
	Memorandum - Preliminary Evaluation of Potential Remedial Technologies (GW & Sediment)	29-Mar-10	20-Mar-13	
	Memorandum - Preliminary Evaluation of Potential Remedial Technologies (Step 1 Evaluation)	3-May-13	3-Jun-13	-
	Potential Remedial Technologies Table	2-Aug-13	19-Sep-13	
<u>Evaluation of Remedial Technologies Report</u>				
	Draft Evaluation of Remedial Technologies Report	18-Oct-13	13-Mar-14	
	Draft Evaluation of Remedial Technologies Report	27-Jun-14	4-Sep-14	
<u>UW K_d and pH/Si Precipitation Testing Work Plan</u>				
	UW K _d and pH/Si Precipitation Testing Work Plan	30-Apr-14		
	UW K _d and pH/Si Precipitation Testing Work Plan	27-Oct-14		

Table 1

**Status of SOW Deliverables
Groundwater and Sediment Remediation
as of December 31, 2016**

Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
	<u>Memorandum - Recommended Remedial Alternatives</u> Draft Memorandum - Recommended Remedial Alternatives Final Memorandum - Recommended Remedial Alternatives			
	<u>Evaluation Report for Remedial Alternatives</u> Draft Evaluation Report for Remedial Alternatives Revised Evaluation Report for Remedial Alternatives			
	<u>Memorandum - Soil Flushing Treatability Study</u> Soil Flushing Treatability Study Memorandum	13-Jun-13	TBD	
	<u>UW Draft Final Effects of pH/Redox Potentials Report</u> Effects on the Partition Coefficients Characterizing Heavy Metal Release from Site Soils Report	4-May-15		
	<u>Feasibility Study Report</u> Draft Feasibility Study Report Draft Feasibility Study Report Revised Feasibility Study Report	4-May-15 13-Jun-16 9-Dec-16	5-Jan-16 15-Dec-16	
D1	<u>Drain Tile/Embankment Cap Modeling</u> Memo - Summary of Modeling Methodology Discussions Memo - Qualitative Analysis of Density Effects Draft Modeling Plan Draft Modeling Plan (revised) Final Modeling Plan Memo - Existing Conditions Model Memo - Existing Conditions Model Final Draft Modeling Report Final Modeling Report	30-Dec-03 21-Jan-04 26-Feb-04 15-Apr-04 12-May-04 6-Jul-04 9-Aug-04 2-Nov-04 -	21-Jan-04 - 22-Mar-04 - 20-Jul-04 25-Aug-04 15-Mar-05 -	4-Feb-04 4-May-04
Task E - 3D Groundwater Flow Modeling				
E1	<u>Develop Modeling Plan</u> Preliminary Modeling Plan Draft Modeling Plan Final Modeling Plan	5-Nov-04 16-Dec-04 -	- - -	29-Nov-04 17-Jan-05
E2	<u>3D Model Construction and Calibration</u> Technical Memorandum - Density Effects Evaluation and Simulation Program Selection <u>Interim Deliverable 10.1 - Model Construction</u> Initial Draft Revision 1 Final Draft <u>Interim Deliverable 11.1 - Calibration Progress</u> Memo/Meeting Initial Draft for Presentation	10-Feb-05 23-Jan-08 13-Feb-08 26-Feb-08 8-Apr-08	- verbal verbal - -	12-Apr-05 26-Feb-08 -

Table 1

**Status of SOW Deliverables
Groundwater and Sediment Remediation
as of December 31, 2016**

Task	Description	OCC	Agency	
		Date Submitted (Projected)	Date Comments Received by OCC	Date Approval Received by OCC
<u>Interim Deliverable 14.1 - Density Equation of State</u>				
	Initial Draft	2-Feb-07	28-Feb-07	
	Revision 1	9-Apr-07	19-Apr-07	
	Final Draft	24-Apr-07	-	(a)
<u>Model Peer Review Memos</u>				
	Peer Reviewer Responses to Agency Questions	10-Aug-10	15-Nov-10	-
		4-Jan-11	-	-
<u>Model Calibration Report</u>				
	Preliminary Draft Model Calibration Report	6-Jul-09	27-Aug-09	
	Draft Model Calibration Report	19-Jul-10	3-Aug-11	
	Revised Draft Model Calibration Report	31-Oct-11	14-Aug-12	
	Revised Draft Model Calibration Report	1-May-13	-	
	Draft Model Calibration Report	29-Aug-14		TBD
<u>Work Plan for Contaminant Transport Model (CTM)</u>				
	Memorandum - CTM Conceptual Approach	11-Jul-11	22-Sep-11	
	CTM Pre-Work Plan	5-Dec-11	-	
	CTM Pre-Work Plan	20-Jan-12	22-Feb-12	
	Draft CTM Work Plan	15-May-12	9-Apr-13; 25-Nov-13	
E3	<u>Modeling of Remedial Alternatives</u>			
	<u>Model Application Report</u>			
	Draft Model Application Report			
	Final Model Application Report			
Interim Measures				
	<u>Vapor Intrusion Pathway Mitigation</u>			
	Draft Vapor Intrusion Pathway Mitigation Work Plan	25-May-12	20-Jul-12	
	Draft Vapor Intrusion Pathway Mitigation Work Plan	4-Sep-12	5-Nov-12	
	Cancelled November 13, 2012			
	Vapor Mitigation Work Plan	24-Dec-13		
	Vapor Mitigation Design Plan	4-Mar-14	4-Apr-14	
	Revised Draft Vapor Mitigation Design Plan	25-Apr-14		14-Jun-14
	Vapor Mitigation Design Plan	8-Jul-14		
	<u>Groundwater Treatment Plant Replacement</u>			
	Groundwater Treatment Plant - Replacement Design Approach	24-Jan-13	7-Feb-13	
	Draft Extraction Well Pilot Test Installation Work Plan	15-Feb-13	20-Mar-13	
	Interim Action Work Plan for Groundwater Treatment Plant Replacement and Extraction System Enhancement	6-Mar-13	3-Jun-13	
	Draft Extraction Well Pilot Test Installation Work Plan	9-Apr-13	30-Apr-13	
	Revised Draft Extraction Well Pilot Test Installation Work Plan	23-May-13	6-Jun-13; 14-Jun-13	
	Revised Draft Extraction Well Pilot Test Installation Work Plan	13-Jun-13; 17-Jun-13		18-Jun-13

Notes:

- (a) Agency comments or approval have not been received
- Deliverable in Progress - Anticipated Submittal Date or Deliverable Due Date
- TBD Date To Be Determined