

Change Number M-15-93-02	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date Jan. 25, 1994
Originator Julie Erickson	Phone 376-3603	
Class of Change <input type="checkbox"/> I - Signatories <input checked="" type="checkbox"/> II - Project Manager <input type="checkbox"/> III - Unit Manager		
Change Title 100-HR Area Groundwater Operable Unit Milestone Revision.		
Description/Justification of Change Add to the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) the following milestone: <u>M-15-06E:</u> Begin pilot-scale pump and treat operations for 100-HR-3. Due Date: August 1994 The scope of the test will be determined based upon the results of the lab/bench scale tests currently being conducted to meet interim Milestone M-15-06B.		
Impact of Change Pilot-scale testing of chemical reduction/precipitation will be necessary to support remediation design and full scale implementation. However, pilot-scale testing of ion exchange will likely not be necessary since scale-up effects are well-known for this technology. Conduct of pilot-scale test activities may lead to accelerated cleanup of groundwater in the 100-HR-3 Operable Unit.		
Affected Documents Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Action Plan, Appendix D, Work Schedule.		
Approvals <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved This change form approved by Amendment Four to the Hanford Federal Facility Agreement and Consent Order executed by the signatories on January 25, 1994. John Wagoner _____ January 25, 1994 DOE Date Gerald Emison _____ January 25, 1994 EPA Date Mary Riveland _____ January 25, 1994 Ecology Date		RECEIVED MAR 17 2003 EDMC

ACCELERATED CLEANUP OF GROUNDWATER, 100-HR-3 OPERABLE UNIT

ACTION:

Begin groundwater cleanup through the accelerated start of pilot-scale pump and treat projects for the 100 Area groundwater. Contaminants to be addressed in the 100-H Area are chromium. The treatment system will continue to operate until the record of decision (ROD), unless determined to be ineffective or unjustified for human or ecological risk reduction. The treatment systems (wells, pumps, surface equipment and disposal) will be modified/expanded as needed during the treatability and remediation activities to improve the efficiency of the cleanup activities.

BACKGROUND:

Activities conducted within the bounds of the 100-HR-3 Operable Unit (OU) resulted in chromium contamination of the groundwater and subsequently of springs discharging to the Columbia River. These discharges exceed both chronic (11 ug/L) and acute (16 ug/L) lowest observable effect levels for juvenile salmon (EPA, 1986). All chromium analyses available for the 100-HR-3 OU report total chromium, whereas the hexavalent form of chromium is toxic.

There are two areas of concern where chromium concentrations exceed ecological levels of concern. In the 100-D Area, chromium concentrations in wells adjacent to the river are as great as 378 ug/L (Well 199-D8-54A). The maximum concentration of chromium (123 ug/L), determined during sampling of springs in 1990, was found near this same location. A sample of the Columbia River was collected simultaneously with the groundwater sample. The river sample was collected 0.5 feet above the bottom. The chromium concentration of that sample was 2.4 ug/L. In the 100-H Area, chromium concentrations in wells adjacent to the river are as great as 230 ug/L (Well 199-H4-18). The data indicate that chromium concentrations are decreasing with time in the 100-H Area. The maximum chromium concentration determined during the 1990 spring sampling was 51.6 ug/L; the river sample at that location yielded a concentration of 2 ug/L. These are total chromium values and are assumed to be hexavalent chromium as a worst case scenario.

Concern has been expressed by the U.S. Environmental Protection Agency (EPA) and the State of Washington Department of Ecology (Ecology) relative to potential hexavalent chromium impact to aquatic life in the Columbia River. These concerns will be addressed by the ongoing activities discussed in this change request.

SCOPE:

A Qualitative Risk Assessment (QRA) will assess the ecological risk for three scenarios: (1) maximum well concentrations from near river wells; (2) maximum spring concentrations; and (3) maximum river concentrations. A LFI will use these risks, along with other factors to determine whether an Interim Remedial Measure (IRM) is justified. Also, there is ongoing bench scale treatability testing to address four contaminants and areas of concern: chromium, nitrates, gross alpha and gross beta.

A bench scale treatability test is being conducted on reduction/precipitation processes and ion exchange for removal of chromium.

These laboratory/bench scale tests will be completed to meet a Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) milestone, M-15-068, for remedy selection which will provide the necessary data to support feasibility studies and the OU ROD. A second phase, groundwater treatability study involving pilot-scale testing (on-site) will be performed to generate data for remedial design. The scope of the studies will be determined based upon the results of the lab/bench scale tests but is anticipated

to include pilot-scale studies of chemical reduction/precipitation only. Location of pilot-scale treatability test within the 100-HR Area will be based on the potential for the greatest reduction of risk to the ecological system utilizing the existing well system. Field testing activities will be completed in October 1994. A test plan will be prepared to establish the criteria for determination of what constitutes a successful test. Assuming the pilot scale test is successful it would continue to operate until the ROD. Full-scale operation would be implemented if it were determined to be the selected remedy under the 100-HR-3 ROD. If the pump and treat operation is the selected remedy under the ROD it would continue until the three parties evaluate the operation using the following criteria:

- 1) Hexavalent chromium measured in wells near the Columbia River fall below the MTCA standard (50 ug/L) for two consecutive sampling periods.
- 2) Sampling of water occurring in the river bottom substrate environment, where springs are suspected to discharge contaminated groundwater, in concentrations representative of the plume, indicates that hexavalent chromium in this environment is below and will remain below the chronic ambient water quality criterion for the protection of freshwater aquatic life for hexavalent chrome (11 ug/L) set by the EPA.
- 3) Groundwater/Columbia River interaction studies, numerical models or physical models indicate that predicted levels of hexavalent chromium within the riverbed substrate environment, where contaminated groundwater is suspected to discharge, in concentrations representative of the plume, are below the chronic ambient water quality criterion for the protection of freshwater aquatic life for hexavalent chrome (11 ug/L) set by the EPA.
- 4) Biological surveys, such as aerial photographic records, of Columbia River sections where contaminated groundwater discharges may be reasonably be expected to occur, indicate that contemporary salmonid redd distributions are at concentrations and locations expected if hexavalent chromium were not an influence.
- 5) The effectiveness (including cost/unit of hexavalent chromium removed) of the treatment technology does not justify further operation.
- 6) An alternate treatment technique, such as chemical reduction of the hexavalent chromium to a less toxic valence, that is more effective or is less costly is substituted.

ASSUMPTIONS:

- The LFI activities do not identify hexavalent chromium data inconsistent with data to date.
- The QRA justifies the need for remediation.
- Treated effluent containing contaminants above State water quality standards can be disposed of to the soil column or aquifer.
- Hazardous, radioactive and/or mixed waste (e.g. resins) will be stored and/or disposed of on-site at locations as agreed to by the three parties.
- Bench scale tests will confirm treatment assumptions.
- The pilot-scale treatability test will be performed in accordance with the 100-HR-3 Groundwater Treatability Test Plan.

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Description/Justification of Change (Continued)

- Additional details and clarifications will be developed by the responsible Unit Managers and documented on a Tri-Party Agreement, Unit Manager Agreement Forms.

SCHEDULE:

M-15-06E

Begin pilot-scale pump and treat operations for 100-HR-3

Due Date: August 1994

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IT IS SO AGREED:

Each undersigned representative of a Party certifies that he or she is fully authorized to enter into this Agreement and Action Plan and to legally bind such Party to this Agreement and Action Plan. These change requests and amendments shall be effective upon the date on which this amendment agreement is signed by the Parties. Except as amended herein, the existing provisions of the Agreement shall remain in full force and effect.

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Gerald Emison
Gerald Emison
Acting Regional Administrator
Region 10
U.S. Environmental Protection Agency

1-25-94
Date

FOR THE UNITED STATES DEPARTMENT OF ENERGY:

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FOR THE WASHINGTON STATE DEPARTMENT OF ECOLOGY:

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