
SUBJECT 100/300 AREA RIVER CORRIDOR BASELINE RISK ASSESSMENT DQO, ERAGS
STEP 3, 13 OCTOBER 2004 MEETING

TO Distribution

FROM Steve Weiss

DATE 29 November 2004

ATTENDEES

See Attachment 1

DISTRIBUTION

Roy Bauer E6-35
Tim Lee H0-23
Jenifer Linville H0-23
Donna Morgans H0-23
Darci Teel H0-23
Jill Thomson H0-23
Document and Information Services H9-04

An all-day meeting on the above subject was held on 13 October 2004, in the Ecology (Richland Office) conference room.

Ken Gano introduced the meeting with a slide presentation emphasizing that, in contrast to typical risk assessments under EPA's Ecological Risk Assessment Guidance for Superfund (ERAGS) and Risk Assessment Guidance for Superfund (RAGS), the focus of this investigation is on waste sites that have already been remediated. The meeting facilitator, Roy Bauer, then provided a project overview with discussion on project activities (e.g., issues matrix, and ecological and human health risk assessments) and project schedule.

Neptune and Company's Randy Ryti and Jim Markwiese, the subcontractors leading the data quality objectives (DQO) process, then gave a PowerPoint presentation (available for viewing at http://www.bhi-erc.com/projects/risk/docs/Step_3_workshop_13Oct04.pdf), and comments and suggestions were solicited from the assembled participants (see attachment). Paper copies of the slides and additional supporting materials (e.g., more detailed screening information for contaminants of potential ecological concern; COPECs) were provided to project participants. Highlights of the presentation include the following:

- Recognition of unique aspects of the assessment, particularly the focus on remediated waste sites, and including the integration of multiple chemical stressors and physical disturbance from remedial activities, issues of scale, the inclusion of diverse ecological settings (upland, riparian and near-

shore river) and the extensive historical data that exists for the 100/300 Areas of the Hanford Site.

- A discussion of the data used for the assessment, including post-remediation surface soil, sediment and surface seeps, surface water data, aquifer tubes and groundwater from 100-B/C, 100-B/C-K, 100-D, 100-H, 100-K, 100-N, 300 Area, Hanford Townsite, and White Bluffs Townsite, as well as the plan for making the data set more robust by incorporating additional information. It is important to note that the October 13th presentation was based on data collected to date, and that additional data and a revised data pull will be completed by 1 December 2004.
- A discussion of the conservative nature of the screening level ecological risk assessment (SLERA) (e.g., use of maximum values) highlighting the focus on ruling out entities that are not expected to experience adverse effects from site contamination so that resources can be devoted to better understanding those biological entities that may be at risk.
- Discussion of information and ecological entities used to support the SLERA, including: plants, soil invertebrates, aquatic and sediment biota and terrestrial wildlife based on data collected from a variety of state and federal sources.
- An explanation of the selection criteria underlying COPEC selection such as exceeding media- and organism-specific toxicological benchmarks, radionuclides significantly contributing to dose based on the sum of fractions (SOF), assessing detection limit adequacy, statistical data assessment and process-knowledge considerations.
- The draft COPEC list resulting from selection criteria includes: (metals) Sb, As, Cd, Cr, Cr-VI, Cu, Pb, Li, Mn, Hg, Ag, Sn, U, V, Zn, (organics) PCBs, 4 Pesticides, 8 PAHs, TPH and (radionuclides) C-14, Cs-137, Ra-226/228, Sr-90, Th-228/232.
- The integrated conceptual model outlining transport of past releases across upland, riparian and near-shore river environments as well as exposure pathways to ecological receptors. For purposes of focusing the assessment, this integrated model is simplified through representation by two models: one for the riparian and near-shore river connection and one for the upland setting.
- Draft assessment entities were selected from the riparian/near-shore river and upland setting based on Hanford Site historical knowledge, exposure pathway analyses and on trophic relationships among receptors. Selection criteria for attributes of entities were justified in terms of focusing the risk questions that will be used to drive subsequent stages of the assessment.
- The results of the preliminary evaluation of human health risks were discussed and the screening approach and results were presented. Soil contaminants of potential concern (COPCs) include (radionuclides) Cs-137, Co-60, Eu-152, Eu-154, Ra-226, Sr-90, Th-232, U-233/234, U-234, U-235, U-238; (chemicals) As, Ba, Pb, PCBs (Aroclor-1248, -1260); and carcinogenic PAHs [benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene]. Water COPCs include (radionuclides) C-14, H-3, Ra-226, Ra-228, Sr-90, Th-232, U-234, U-238; and (chemicals) NO₂, Sb, Cr⁺⁶, Ni.

Meeting participants provided the following comments:

1. A question was raised regarding how transport was being assessed and information was requested for the scale of the assessment as well as the use of process knowledge for COPEC analysis. It was clarified that transport from past operations and facility releases is addressed for present day, both within sites and across sites, based on two related conceptual models, and that historical operations and process knowledge are used to identify COPECs.
2. It was asked what can be expected for background water concentrations and whether background issues will be released in a separate document. In response, water background data are derived

from wells upgradient of the Hanford Site and background will be addressed in the workbook resulting from this assessment, not as a separate document.

3. The use of Hanford Site soil background data was unclear to some participants; e.g., does it include surface releases? The Hanford Site soil background data that is not influenced by surface releases and fallout was used in this assessment.
4. Concerns were raised with regard to the use of maximum concentrations in screening. It was suggested that it might be more protective to calculate an upper concentration limit (UCL) if the data set is small because the UCL could be greater than the max in such instances. In response, UCLs will be calculated for analytes for which data are limited, time permitting.
5. Considering the two components of the integrated conceptual model (ICSM), it was asked if wide-ranging species or species that utilize both upland and riparian/near-shore river areas were being addressed. Participants also inquired how operations were being shown in the integrated conceptual model. In response it was clarified that, to the extent practicable, species common to both upland and riparian/near-shore river areas are being considered as assessment endpoints. Past operations are broken out in the separate upland and riparian/near-shore river conceptual models. It was noted that species obligate to contaminated areas should also be considered.
6. It was noted that in contrast to the slope depicted in the integrated conceptual site model, some areas have a more gradual transition. It was noted that there are exceptions to any generalized conceptual model. The intent is to represent the most characteristic setting.
7. The question was raised of whether old radiological surveys are being used for understanding contaminant fate and transport? They are not used directly for fate and transport determination, per se, but the limited field investigations that are represented through the process knowledge COPEC evaluation would likely have used available radiological surveys.
8. It was asked whether all pathways were being considered and whether a mass balance approach to historical releases was appropriate. For example, concerns were raised in regard to assessing how much contamination was released via stacks, direct discharge, retention basins, etc. In response, it was noted that we have knowledge of processes and releases (documented in the technical baseline and RI/FS reports). The assessment may consider old RI/FS documents with respect to mass balance, but this will necessarily be a more qualitative effort.
9. Considering the focus on remediated sites, an issue was raised about resuspension of soil contamination during remediation and questions were raised about the kind of air sampling that was performed during remediation. In response, air monitors showed very limited resuspension; 1/1000th to 1/10000th of an "air release." It was also noted that the amount of water used for dust suppression was probably excessive for the initial cleanups.
10. The question was raised about the documentation of pathways considered and not considered in the integrated conceptual site model and how potentially unidentified waste sites are being addressed. In response, it was clarified that characterization and remediation activities have focused on cataloging waste sites for 20 years and discovery of major sites are not expected at this point. Through extensive historical documentation and past and current radiological surveys, it is believed that the major waste sites have been documented. Additional lines of evidence, such as biota body burdens, are also being used as integrators of site contamination to assess the potential for exposure from undocumented waste sites. Questions were also raised later in the workshop about whether this assessment will attempt to locate potentially undiscovered waste sites. The purpose of this study is not to identify waste sites, rather, to evaluate data to support the final ROD. With that said, however, the Environmental Restoration Contractor (ERC) has plans to evaluate reactor areas and look for "orphan" sites and re-examine air deposition from old stack releases. In the event that unexpected contaminants are found (e.g., in wildlife), conceptual models of past operations and the

draft COPEC list may be revisited.

11. The suggestion was raised that cultural sites and resources should be included in the management goals. It was also noted that state species of concern should be included in the management goals. State species of concern are represented by the general category "special status" species, and the cultural resource suggestion is acknowledged and will be addressed in further consideration of management goals.
12. Considering assessment endpoints, the question was asked about the bald eagle being considered and whether the most sensitive species were being considered. Participants also wanted to ensure that all trophic levels and key bioaccumulators are evaluated. It was also noted that for assessment endpoints, CRCIA Part I is a valuable resource. The response noted that, in selection of assessment endpoints, consideration is given to the overlay of habitat and contaminated media [exposure], as well as the availability of toxicity data and data on feeding/life history strategies. Sensitivity to toxicants and exposure potential is a major consideration in the selection of assessment endpoints.
13. It was unclear how the assessment is making use of other historical and ongoing ecological investigations. To address this, it was emphasized that this assessment has drawn on the vast ecological literature specific to Hanford Site, and to which many of the project participants have contributed. To further address this concern, a workshop was proposed for sharing information on current and past ecological work at the Hanford Site, tentatively scheduled for January 5th or 7th.
14. To some participants, it seems like a study is needed to assess sediment contaminants and benthic macroinvertebrate adverse effects. The question was raised whether data are going to be collected to address this. It was the experience of participants that models are relied upon for largely qualitative assessments. To clarify, it was noted multiple lines of evidence, potentially including empirical and site-specific toxicity studies, will be used for an assessment of the potential for adverse ecological effects.
15. It was noted that while amphibians are considered as assessment endpoints, they're not abundant. Although not abundant, they may be desirable endpoints because of known sensitivities and high exposure potential.
16. Participants asked about reptiles and about whether insectivorous reptiles could be lumped with another class. It was clarified that yes, reptiles could probably be lumped with another class but that the focus here is really on lizards. It was further clarified that employment of this particular endpoint is conditional on the results from Central Plateau Eco DQO, to assess whether reptile data can be collected in a resource-effective manner.
17. Considering birds as assessment endpoints, it was asked if field surveys note presence and absence. In response, it was noted that problems exist with studying birds, including seasonal effects (exposure to site for only a portion of the year) and body (egg) burdens that could have been accumulated elsewhere. For example, migratory waterfowl will have higher radionuclide body burdens from seasonal residence at higher latitudes. Considering bird mobility, birds are also subject to high variability in sighting. Collection of eggs from the second clutch suggested for limiting uncertainty around Hanford-specific body burdens but a participant noted that there might be issues with collecting data from second clutch as some COPECs from previous (non-Hanford) exposures may still be released in the second clutch.
18. Avian species diversity was noted as a good measure of ecological effects, and it was suggested for inclusion in the assessment. In response it was noted that species diversity entails considerable variability and that bird species diversity is potentially more affected by non-chemical stressors than by site contamination. Species diversity may, however, be more tractable a metric for the riparian/near-shore river area relative to terrestrial environments because of the extensive use by stream ecologists to assess ecological conditions with well-established and well-documented

techniques such as benthic macroinvertebrate diversity. It was recognized that there is a need to evaluate baseline conditions. It was further noted that species diversity might be among a quartet of measures, including: literature, laboratory, field measures and models.

19. It was asked if the hyporheic zone was in the project scope, whether sampling for organisms was planned for hyporheic zone, how large the hyporheic zone is and questions were raised about its general importance. In response, it was acknowledged that these are interesting questions and that studies could be designed to address them. It was also clarified, however, that resources are limited and should be used where the need is greatest. Furthermore, it was not apparent how information gleaned from hyporheic studies would inform remedial decision making for final RODs. There are currently aquifer tube data for chemical information on hyporheic waters. The hyporheic zone could be simply evaluated by empirical means by placing uncolonized substrate in upwelling zones of contaminated groundwater and measuring what has colonized the substrate over time.
20. The question was raised whether reproductive data exist for middle/upper trophic levels and it was noted that data are available for some species.
21. In reference to temporal scale limitations for selection of assessment endpoint attributes, insufficient time to perform a study was not considered to be a valid criterion by the Ecology regulators. If a second year of sampling is required, they will ensure the schedule is extended to allow that. It was noted that some studies, such as post-remedy monitoring, will take years.
22. Participants suggested that risk assessments should collect information on natural resource damages to avoid duplicating efforts in future damage assessments. Questions were asked about what is being done for cataloging physical abnormalities. In clarification, physical abnormalities may be a difficult attribute to measure due to small sample size and problems relating cause with effect. However, as they are observed, these data will be recorded for potential future use.
23. Several questions about EcoSSL data on the insignificance of inhalation were brought up. It was observed that the data presented do not address volatile chemicals for relative contribution of inhalation to overall exposure. What is the risk of exposure to volatiles and what about fuels used during past operations? In response it was noted that, based on the available data, there's no reason to include the volatiles; i.e., volatiles do not warrant COPEC status. Although TPH is being carried forth in the assessment, past releases of fuels will result in a loss of volatile components over time.
24. A participant inquired about Tina Carlson's (Lawrence Livermore National Laboratory) work on inhalation risks. It was noted in response that Carlson predicted volatile build up in burrow air, but when actually sampled in burrows, volatiles were not found. This was explained in terms of modeled estimates of VOCs in burrow air being overly conservative by not accurately accounting for burrow air flushing.
25. The question was asked if soil biological crusts were part of the assessment for upland areas? It was noted that crusts may be good endpoints in some respects but it was unclear how one would assess effects. It was suggested that crusts could be used to assess habitat quality (presence/absence).
26. It was requested that the horned lark be considered in lieu of the meadowlark for an upland omnivorous bird. It was also noted that quail and cottontail rabbits are present in the 300 Area and should be considered.
27. Various participants suggested considering a list of receptors from which to choose assessment endpoints. An action item of the assessment team is to consult with Ted Poston (Pacific Northwest National Laboratory) and other site experts for representative species.
28. It was asked how elevated concentrations observed in far-ranging species were being considered. In response, it was noted that these organisms are getting exposure from a multiple locations. Given logistical constraints for studying far-ranging species and confounding factors of multiple exposure

opportunities, they would represent more of a modeled species than an empirically-studied species in the assessment.

29. It was suggested that Tc-99 and TCE are over the human health MCL, and questions were raised about why they are not part of the COPEC list. In response, it was noted that Tc-99 does not exceed its biota concentration guideline (BCG), nor does it contribute significantly to the SOF. TCE does not meet the requirements for inclusion as a human health COPC.
30. Ecology representatives stated that new Washington Administrative Code 173-340 tables are available and that they should be used. The use of new Ecology values is under consideration at this time. The question was also raised of whether soil cleanup levels from the old WAC (100 times rule) were used and would it include uranium under new rules. The response to this was yes in both cases.
31. The origin of human health sediment values was unclear and it was clarified that shallow zone cleanup levels were applied to sediment.
32. It was unclear how PCBs (especially dioxin-like PCBs) were measured. It was clarified that past Hanford work analyzed 22 or 23 primary congeners and all congeners were below detection. In this instance, congener analysis was based on process knowledge. While a risk evaluation based on congeners could be performed by conversion to dioxin value, it was noted that not all PCB congeners give dioxin-like effects. Suggestions to use total aroclors as an additional line of evidence for risks from PCBs.

Attachment 1

Ecological DQO 100 Area and 300 Area Component of the RCBRA 10/13/04 Meeting Attendees

Name	Company/ Organization	Telephone	Email
Roy Bauer	FH	(509) 373-3931	Roy_G_Bauer@rl.gov
Rico O. Cruz	CTUIR	(541) 696-3664	ricocruz@ctuir.com
Damon Delistraty	Ecology	(509) 329-3547	Ddel461@ecy.wa.gov
Dirk Dunning	Oregon state	(503) 378-3187	dirk.a.dunning@state.or.us
Larry Gadbois	EPA	(509) 376-9884	Gadbois.larry@epa.gov
Ken Gano	BHI	(509) 372-9316	kagano@bhi-erc.com
Larry Goldstein	Ecology	(360) 407-6573	lgol461@ecy.wa.gov
Dib Goswami	Ecology	(509) 372-7902	dgos461@ecy.wa.gov
Nancy Kohn	PNNL	(360) 681-6387	nancy.kohn@pnl.gov
Dan Landeen	Nez Perce	(208) 843-7375	Danl@nezperce.org
Jenifer Linville	CH I	(509) 372-9107	jklinvil@bhi-erc.com
Jim Markwiese	Neptune & Co.	(505) 662-2121	Jimm@neptuneinc.org
Jay McConnaughey	YN	(509) 945-4797	j.mccon@verizon.net
Donna Morgans	CH2M Hill	(509) 372-9427	dmorgans@ch2m.com
Harry Ohlendorf	CH2M Hill	(916) 286-0277	hohlendo@ch2m.com
Lew Pamplin	BNI	(509) 372-9108	LPamplin@earthlink.net
Bob Peterson	PNNL	(509) 373-9020	Robert.Peterson@pnl.gov
Ted Poston	PNNL	(509) 376-5678	Ted.poston@pnl.gov
Wade Riggsbee	YN	(509) 943-5432	Riggsbee@owt.com
Beth Rochette	Ecology	(509) 736-3020	broc461@ecy.wa.gov
Randy Ryti	Neptune & Co.	(505) 662-2121	Rryti@neptuneinc.org
Brad Sample	CH2M Hill	(916) 920-0212 x 485	bsample@ch2m.com
John Sands	DOE	(509) 372-2282	john_p_sands@rl.gov
Don Steffeck	USFWS	(503) 231-6223	D_steffeck@fws.gov
K. Michael Thompson	DOE-RL	(509) 373-0750	K_m_mike_Thompson@rl.gov
Jill Thomson	CH I	(509) 372-9200	jethomson@bhi-erc.com
Brett Tiller	PNNL	(509) 376-3444	brett.tiller@pnl.gov
Lauri Vigue	WDFW	(360) 902-2425	viguelav@dfw.wa.gov
Dana Ward	DOE-RL Closure	(509) 372-1261	Dana_C_Ward@rl.gov
Steve Weiss	BHI	(509) 372-9495	Sgweiss@bechtel.com