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Environment

Mr. Thomas P. Lanphar
Senior Hazardous Substances Scientist
California Environmental Protection Agency
Department of Toxic Substances Control
700 Heinz Avenue, Suite 100
Berkeley, California 94710

Subject:
Response to DTSC Comments dated January 24, 2011 regarding the Technical Memorandum - Risk Assessment Approach for Operable Unit E, Former Georgia-Pacific Wood Products Facility, Fort Bragg, California dated December 20, 2010.

Date:
March 18, 2011

Contact:
Kim Walsh

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925-296-7837

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Kimberly.Walsh@arcadis-us.com

Our ref:
B0066138.0006.0001

Dear Mr. Lanphar:

ARCADIS is submitting this response to comments from the Department of Toxic Substances Control (DTSC) on the *Technical Memorandum - Risk Assessment Approach for Operable Unit E* dated December 20, 2010, submitted by ARCADIS on behalf of Georgia-Pacific, LLC (Georgia-Pacific). DTSC provided the comments in a memorandum dated January 24, 2011. ARCADIS proposes to incorporate the requested revisions to our approach (that are outlined in the responses below) in the forthcoming OU-E Remedial Investigation (RI) Report.

Comments and Responses related to the human health risk assessment approach are presented in Section 1; while comments and responses pertinent to the ecological risk assessment are presented in Section 2. Comments are in bold with responses following.

1.0 HUMAN HEALTH RISK ASSESSMENT APPROACH

General Comment

This technical memorandum presents OU-E-specific modifications to the risk assessment approach described in the site-wide RAWP. OU-E includes all the manmade ponds existing on site as well as the proposed park area defined as the Mill Pond Complex. Because the Division of Safety of Dams (DSOD) has required that the current structures enclosing Pond 8 be removed, including the dam, cribwall, and north wall components, the health risk assessment will evaluate risks based on proposed future conditions and will not include a baseline risk assessment assuming the current configuration of this OU. Most of OU-E will be regraded and the operable unit ecologically restored by creating

wetlands, upland habitat, and a riparian corridor. A separate memorandum from the Ecological Risk Assessment Section (ERAS) of the HERO has addressed the proposed ecological risk assessment approach. This memorandum focuses on the human health risk assessment methodology.

Response to General Comment: Agreed. The health risk assessment will evaluate risks based on proposed future conditions and will not include a baseline risk assessment assuming the current configuration of this OU. Under the future use scenario (Alternative 6) for the MPC, habitats include daylighted streams/channels features, consisting of riparian corridors with floodplain wetlands; lowlands wetlands and open water features (high marsh and low marsh); and adjacent terrestrial habitats. DTSC comments will be addressed, as noted below, in the OU-E RI Report.

Specific Comments

Comment 1. Page 3/14 - Background. One of the objectives of the Mill Pond Complex restoration project is to connect the north and south Coastal Trail segments. It would be informative to include the proposed general route of this segment on the figures showing the future configuration.

Response to Comment 1: Agreed. Connecting the coastal trail through the OU-E lowland area is one objective of the Mill Pond Complex (MPC) restoration project. The conceptual design for this portion of the project is currently in progress. As requested, the proposed general route of the coastal trail will be presented on a figure in the OU-E RI Report.

Comment 2. Page 3/14 - Objectives. It is stated here that Ponds 5 and 9 will not be included in the risk assessment, because they had no known industrial use. As noted by ERAS in its memorandum, dated January 14, 2011, data confirming the lack of chemicals of potential concern (COPCs) in these ponds should be presented to support this statement. In the risk assessment report, those data should be summarized and the report where these data are located should be cited. These data must be part of the rationale for excluding these ponds from further evaluation.

Response to Comment 2: Agreed. Data associated with Ponds 5 and 9 will be summarized in the nature and extent portion of the OU-E RI Report. As requested by DTSC, the risk assessment will provide the rationale for excluding these ponds from further evaluation.

Comment 3. **Page 6/14 - Receptors, and Page 7/14 - Exposure Assessment. The human receptors to be included in the health risk assessment include the maintenance/utility/trench worker, the construction worker, and the recreational visitor. The HERO agrees that these are appropriate receptors for evaluation and that the residential receptor need not be considered for OU-E. However, the HERO recommends that the restoration volunteer be considered, as it is quite possible that volunteers will be involved in planting and other restoration activities. These volunteers may have greater contact with soils and sediments.**

Response to Comment 3: Agreed. As requested, a restoration volunteer will be considered as part of the OU-E exposure assessment. Potential exposure assumptions for the restoration volunteer will be based on the scope and timeline of the proposed restoration activities.

Comment 4. **Page 8/14 - Exposure Assessment. A) It is stated that Figure 8 shows the proposed exposure units for OU-E. Exposure Unit 4, Ponds 1 through 4 (Southern Ponds), is not included on this figure and should be so noted. B) The terrestrial area around the southern ponds will not be evaluated, because COPCs were not detected in upgradient areas. Data for the terrestrial area itself should be used to support the exclusion of this area from further evaluation.**

Response to Comment 4A: Agreed. Ponds 1 through 4 (Southern Ponds) are shown on Figure 1 of the Technical Memorandum. A figure clearly labeling Ponds 1 through 4 as Exposure Unit 4 will be provided in the forthcoming OU-E RI Report.

Response to Comment 4B: The terrestrial areas adjacent to OU-E in the Southern Ponds area are located in OU-D and were evaluated in the OU-C/D RI Report. No soil data have been collected within the Southern Pond OU-E boundary. The terrestrial area outside Southern Pond OU-E boundary lies within OU-D. Please refer to the OUC/OUD RI Report for a summary of data collected within nearby terrestrial areas. Specific soil sampling locations in OU-D that are nearest to OU-E Southern Ponds are shown on Figures 2-12 through 2-14 of the OUC/OUD RI Report. Figure 2-1 of the OUC/OUD RI Report illustrates the Areas of Interest that surround the OU-E Southern Ponds.

Comment 5. **Page 11/14 - Soil/Sediment Dataset, and Figure 9 Flow-Chart for Risk Assessment Dataset Preparation. Please confirm that the data for**

the southern ponds will be included as part of the dataset to be evaluated using the flow chart.

Response to Comment 5: Confirmed. As discussed on page 8 of the Technical Memorandum, Exposure Unit 4 (EU-4) includes aquatic/wetland area in OU-E Ponds 1 through 4 (Southern Ponds). As such, data for these southern ponds are represented as "All OU-E data" and "EU-4" on Figure 9.

Comment 6. Page 12/14 - Soil/Sediment Dataset. Soil or sediment concentrations that will become surface concentrations after cut and fill activities are completed will be identified, and new datasets will be created for developing exposure point concentrations for future use. Please describe the approach to be used to determine whether these new datasets will be adequate for such use.

Response to Comment 6: Existing cross-sections and elevation profiles developed for the proposed Alternative 6 design will be used to develop a GIS approximation of the future ground surface. To establish the new datasets for developing exposure point concentrations for future use, this future ground surface will be compared to the existing topographic map and sample location depths will be adjusted accordingly.

The planned future ground surface could be adjusted through the design process prior to final restoration. As a result, the following assumptions will be made to ensure the approximation results in a conservative dataset for risk assessment.

- In areas where soil will be removed during the restoration, the GIS estimation will assume that a minimal amount of soil would be removed. This means that more samples will be used for the risk assessment than are likely to still be in place when restoration is complete. As a result, calculated risk will likely overestimate post-restoration risks.

- Under the remediation alternative envisioned for Pond 8, sediments within the pond will be stabilized prior to filling in the Pond 8 area to form terrestrial habitat. This would likely result in raising the ground surface by 10 or more feet across the pond. This action will remove samples from the risk assessment as they would no longer be within the assessed exposure depths. Nevertheless, to be conservative, the depth of pond 8 sediment samples will be assumed to be unchanged in one scenario in the risk assessment (exposure point concentrations

(EPCs) will be calculated using the two-tiered approach presented in the Technical Memorandum).

Once established, the spatial distribution of samples within the future dataset, along with the sample size and frequency of detection, will be evaluated to ensure that the dataset is robust enough for use in the risk assessment. The approach presented above, as well as the results of the data evaluation, will be further described in the OU-E RI Report.

Comment 7. Page 13/14 - Risk-Based Screening Level Development for Cut Soil Re-Use. A summation mechanism should be presented and utilized to assure that the cumulative risk or hazard posed by contaminants in soils that will be reused will not exceed target risk or hazard levels.

Response to Comment 7: Comment noted. A summary of potential Risk-Based Screening Levels (RBSLs) for individual chemicals by receptor will be provided in the Risk Assessment. The specific application of these RBSLs will be further discussed in a Soil Management Plan to be prepared as part of the Remedial Action Plan (RAP).

2.0 ECOLOGICAL RISK ASSESSMENT APPROACH

General Comment

The report is presented as a Technical Memorandum, but contains some of the elements of a Scoping level Ecological Risk Assessment (SLERA) and those of a Predictive Ecological Risk Assessment (PERA). The input parameters for calculation of average daily dose and the toxicity reference values necessary for calculating hazard quotients are presented in the site wide ecological risk assessment work plan. ERAS understands that the technical memorandum is being presented because of the unusual circumstance of excavation and land forming prior to conducting the risk assessments. When the risk assessment is performed it should contain sample calculations for Chemical of Interest (COI) sediment exposure to vertebrates and soil COI soil calculations for vertebrates. Input parameters (from the site-wide workplan) to calculate dose and toxicity reference values with references to their sources should be included either in the body of the report or as an addendum to the report.

Response to General Comment: Agreed. The ecological risk assessment for OU-E will include the requested information.

Comment 1. Page 3-14, Objectives. The report discusses a risk assessment for a future stream channel. Please describe what the COIs will be and how the exposure point concentrations will be determined.

Response to Comment 1: The future stream channel will traverse a small portion of OU-D and OU-C, and extend northwest to OU-E (see Figure 8, Technical Memorandum). The nature and extent of contamination in OU-C and OU-D was identified in the OUC/OUD RI Report. The soil dataset for the EU-3 risk assessment will consist of soil samples from OU-C and OU-D that are representative of soil anticipated to remain in EU-3 after the stream channel is constructed (please see also response to Specific Comment 6 in Section 1.0 above). These OU-C and OU-D data will be reviewed, compared with background values, and screening levels. Screening levels provided in the Site-Wide Risk Assessment Work Plan (Site-Wide RAWP) (ARCADIS, 2008) will be updated as appropriate. The data selection and screening process will be documented in the OU-E RI Report. If COPCs are identified for EU-3 in soil or groundwater, then EPCs will calculated in accordance with the Site-Wide RAWP.

Comment 2. Page 6-14, Future Land Use and Influence on Exposure Media, first paragraph. Specifically which ponds are referred to as the, 'southern ponds'.

Response to Comment 2: Ponds 1 through 4 are considered the “southern ponds”. These ponds are depicted in Figure 1 of the Technical Memorandum.

Comment 3, Page 6-14 - The report states 'The final disposition of Ponds 5 and 9 has not been determined at this time. As noted previously these ponds had no industrial use and do not contain site-related COIs and so are not addressed in the OU-E risk assessment, If there are no COIs, then there would be no exposure pathway to ecological receptors and there would be no progression in the risk assessment analysis to a PERA. However, simply stating there are no COI's is insufficient from a regulatory standpoint. Data, for the ponds, needs to be presented and at a minimum, an equivalent of a SLERA would be required according to DTSC guidance (http://www.dtsc.ca.gov/AssessingRisklupload/overview.pdf) to

demonstrate that there are no complete exposure pathways to ecological receptors.

Response to Comment 3. Agreed. As noted in the response to Comment 2 in Section 1, data associated with Ponds 5 and 9 will be summarized in the nature and extent portion of the OU-E RI Report. In accordance with DTSC guidance, data confirming the lack of site-related COPCs in these ponds will be presented to support their exclusion from the risk assessment.

Comment 4. Page 7/14 and 7/15, Exposure Assessment. The report identifies four Exposure Units for risk assessment purposes. The report should also discuss how it will address wide ranging receptors that would likely utilize all of the exposure units; for example it is unlikely that the mallard, Virginia rail, great blue heron and raccoon would limit their foraging to a single exposure unit. The statement 'If AUFs < 1 are used, exposure to multiple EUs will be considered as well' should be more fully explained. ERAS believes the report needs to include a discussion of hazard quotients for each of the exposure units relative to each of the other exposure units in determining the need for developing exposure across exposure units.

Response to Comment 4: Agreed. For wide-ranging receptors that may utilize more than one exposure unit, exposure to multiple exposure units will be considered in the OU-E RI Report. The OU-E RI Report will include a discussion of hazard quotients for each exposure unit relative to each of the other exposure units

Comment 5. Page 8/14. The report states 'As stated previously, Ponds 5 and 9 have had no known industrial use and will therefore not be included in the risk assessment. The terrestrial area around the southern ponds also will not be evaluated in the risk assessment because the area had no industrial use and, as stated previously, COIs were not detected at elevated concentrations in upgradient areas (ARCADIS, 2010)'. Please see Specific Comment 3 above.

Response to Comment 5: Please see response to Specific Comment 3. Please see also response to Specific Comment 4B in Section 1.0 above.

Comment 6. Page 9/14, Ecological Exposure Pathways. First bullet: Plants will take up constituents from whatever depth their roots penetrate the soil, not just the upper 2-feet, or even the upper 6-feet. Plants can be exposed to COIs in groundwater at any depth their roots penetrate. If site

plants do not send their roots to depths more than 6-feet and this is known it should be so stated in the report. Third bullet: Herbivorous animals that feed on site plants are exposed to tissue concentrations derived from plant tissue taken up by roots at any depth. If there is a reason that it is expected that plants on site do not send roots deeper than 2 feet or that site related COIs are not found at depths deeper than 2 feet that should be stated in the report.

Response to Comment 6: Agreed. In accordance with the response to agency comments on the Site-Wide RAWP (ARCADIS, 2007), plant tissue EPCs for herbivore exposure models will be estimated assuming root depths from 0 to 6 feet bgs. Potential uncertainties related to plant rooting depths will be addressed in the uncertainty section of the ecological risk assessment.

Comment 7. Page 9/14. The report states 'Wildlife incidental ingestion of constituents in surface sediment and ingestion of surface water for drinking water. Some mammals (i.e., raccoon) may also be exposed to deeper sediment.' Incidental media ingestion is not discussed for terrestrial habitats. Please add incidental soil ingestion to this list.

Response to Comment 7: Agreed. Incidental soil ingestion for terrestrial receptors will be discussed in the OU-E risk assessment. Page 9-14 of the Technical Memorandum states “Burrowing animals may be exposed to soil as deep as 6 feet bgs.” Figure 6 of the Technical Memorandum (Terrestrial Area Conceptual Site Model) specifies that mammals may be exposed to subsurface soil via incidental media ingestion.

Comment 8. Page 9/14, Amphibians. Although the report states that amphibians will be assessed through the direct exposure routes from surface sediment and surface water as well as ingestion of prey items, the methodology for how this will be done needs to be presented. Toxicity data may not be sufficient for adults but a significant database exists for the larvae, a sensitive life stage. As the report notes although the California red-legged frog is not present on site the northern red-legged frog is and it is a California species of special concern.

Response to Comment 8: Agreed. The methods used to assess amphibian risks will be provided in the OU-E RI Report and generally consist of comparing media concentrations with literature-derived reference concentrations. Sediment and surface water screening values provided in the RAWP include Ambient Water Quality Criteria (AWQC) and sediment screening levels that are consensus-based values that incorporate data for a number of types of aquatic

life, including amphibian data, were available. In addition, common sources of amphibian data (such as the RATL database, http://dsp-psd.pwgsc.gc.ca/Collection/CW69-5-357E.pdf, and "Ecotoxicology of Amphibians and Reptiles" by Sparling et al., 2000) will be searched for toxicity data. The OU-E risk assessment will document the amphibian species and life stages on which the reference concentrations are based, if available.

Comment 9. Page 10/14, final bullet of page. Please clarify what is meant by 'stabilization mix'; please give a description of the stabilizing materials. Will the EPC estimated from the ratio of stabilizing material with sediment be verified with any confirmation sampling?

Response to Comment 9: As proposed in the Work Plan for Bench-Scale Solidification Treatability Study (Work Plan) (ARCADIS, 2011), a bench-scale study is proposed to demonstrate the feasibility of solidification to improve the geotechnical performance of sediments, evaluate the impact of solidification on potential leachability, and provide data to support design if feasibility is demonstrated. The "stabilization mix" refers to the combination of the pond sediment and reagent (Portland cement and granular activated carbon, slag, or fly ash) potentially augmented by binder such as Noyo Harbor sand (ARCADIS, 2011). The concentration of the final mixture has yet to be specified, so the risk assessment will include the 2-tiered approach to assess Pond 8 exposure under the future scenario, as proposed in the Technical Memorandum. Tier 1 assumes no added solidification material and no soil cover despite the future terrestrial conditions envisioned for this area. As such, Tier 1 is highly protective considering the Alternative 6 plan. Tier 2, if implemented, will be a more realistic scenario taking into account a 5% addition of solidification material (the lowest percentage specified in the Work Plan) and a projected land surface. Details for the implementation of the potential remedial action will be discussed in the Feasibility Study.

Comment 10. Page 11/14, Risk Assessment Dataset Development. The report states 'As in the previous RIs, soil in presumptive remedy areas (PRAs) will be discussed in the nature and extent section of the RI, but will be excluded from the risk datasets. PRAs will be considered if the following criteria, which are consistent with those applied to OU-A.' By 'considered' does the report mean that areas will be selected as PRAs based on the criteria in the two bullets (not shown here) and therefore excluded from the risk assessment?

Response to Comment 10: Soil locations that meet the criteria noted in the Technical Memorandum will be identified in the OU-E RI nature and extent

discussion. In general, locations that meet the criteria *may* be identified as PRAs. . The selection of PRAs, if applicable, and any associated refinement of risk assessment datasets, will be clearly documented in the OU-E RI Report for DTSC review.

Comment 11. Page 13/14, Risk-Based Screening Level Development for Cut Soil Re-Use. Please state whether the back calculated risk-based ecological screening levels are based on TRV low or TRV high values. ERAS assumes these TRVs will be from the Site-wide ecological risk assessment work plan.

Response to Comment 11: Similar to the approach used to develop RBTLs for OU-A (ARCADIS BBL, 2008), the back-calculated risk-based ecological screening levels will be calculated using derived "mid" toxicity reference values (TRVs) based on the geometric mean of the low (generally representing a no effect exposure level) and the high TRV (generally representing the lowest low effect exposure level). The resulting RBTLs are considered appropriate for supporting risk management decisions recognizing that neither the low nor the high TRV represents a true effect threshold concentration, and the true threshold effect concentration for a given COC likely lies somewhere between the low and high TRVs.

If you have questions regarding our responses to the comments on this document, please contact me at 925-296-7837.

Sincerely,

ARCADIS

Kim Walsh, MPH
Principal Scientist

References

ARCADIS, 2011. Work Plan for Bench-Scale Solidification Treatability Study. Former Georgia-Pacific Wood Products Facility Fort Bragg, California. January.

ARCADIS BBL, 2008. Final Operable Unit A Remedial Action Plan and Feasibility Study. Former Georgia-Pacific Wood Products Facility Fort Bragg, California. August.

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