State of Oregon
Department of Environmental Quality Memorandum

To: **David Weymann, ERM** **Date: 2/10/2020**

From: **Don Hanson, DEQ**

Subject: **Response to ERM 1/3/2020 Technical Memo**

Project: **Adair Village Industrial Site, ECSI 941 (aka Boise Cascade – Camp Adair)**

cc: **Noel Wooten, Nelson Mullins**

Attachment **DEQ staff summary of 11/14/19 conference call**

This memorandum provides DEQ's review of the Technical Memo, which provided the notes from the November 14, 2019 conference call between DEQ and the Adair Village project team, and ERM's comments on DEQ's June 25, 2019 work plan comments.

DEQ is hopeful that we are nearing or at agreement on how the data collected at the site previously, and specifically the Method 4025 TEQ data can be utilized to help identify areas of elevated contamination and areas that would benefit from interim removal actions. Additional data from GC/MS dioxin/furan testing will need to be collected before conducting a final risk assessment and determination that the site or parts of the site are protective of human health and the environment prior to DEQ issuing a No Further Action for the site.

INTRODUCTION AND OVERVIEW
The following are some comments on ERM's introduction and Overview section of the memo:

ERM's Introduction, Page 1:
DEQ was not aware that the City of Adair Village participated in the call.

ERM's Overview, Page 1:

ERM Overview
Prior investigations detected dioxins at the Adair Village Industrial Site. ERM and the Camp Adair Parties propose to use existing dioxin data analyzed by 4025M to quantify dioxin toxicity equivalence (TEQ), identify decision units that warrant further study or action, and scope removal actions, if warranted, to attain a risk-based closure of the site.

DEQ Comment:
To clarify, DEQ does not feel Method 4025 should be used to quantify dioxin toxicity and cannot accept such data for making risk based/closure decisions. These topics are discussed further below.

Overview, Page 1, Bullet 3:
Post-remediation confirmation samples analyzed by gas chromatography/mass spectroscopy (GC/MS) methods are needed to conduct risk assessments or support a risk-based closure of the site. With adequate validation, existing or additional 4025M data may support risk assessment.

DEQ Comment:
We want to be clear and manage expectations regarding the use of 4025 data for risk assessment. As Jennifer explained during the call, the method does not provide definitive congener identification and quantification. QA is not as rigorous as 8290 or 1613b. The 4025 method is a screening data method according to EPA, as compared to a definitive method. This means it is not definitive in terms of the identification of compounds present, e.g. determination by a mass spectrometer, and it is not definitive in terms of quality assurance around the quantitation of the chemicals present. The method is known to have high levels of false negatives (low or non-detect results when high levels of dioxin / furan congeners are present).

While not specifically discussed in the call, according to the DEQ Lab, the only way you would know if there were false negatives would be to serially dilute the samples and then analyze with 4025 to ensure you achieve the expected result. Otherwise, based on a review of the results and any QA, one would not be able to detect the presence of false negatives. The fact that the false negatives occur at high concentrations (noted in the method description as well, http://www.caslab.com/EPA-Methods/PDF/EPA-Method-4025.pdf, Table 5) is particularly problematic. However, as far as DEQ can tell, dilution to test for false negatives this was not conducted in the previous use of Method 4025 at this site. Based on the laboratory's review, it should be done in the future if Method 4025 is used, as well as some co-located 4025 / 1613 data.

Overview, Page 1, Bullet 5:
Post-remediation confirmation may use a combination of sampling and analytical methods to verify attainment of removal action goals, including (but not limited to): incremental sampling methodology (ISM), high resolution GC/MS analytical methods, and 4025M analytical method.

DEQ Comment:
Method 4025 may be used as a screening tool to preliminarily verify attainment of remedial action goals. As stated in Bullet 4, traditional GC/MS methods will be needed for risk assessment and site closure purposes.

TELECONFERENCE SUMMARY (11/14/19 conference call)

Response to DEQ Comments & Additional Points Raised in the Meeting:

ERM's summary covers a lot of the topics that were discussed, and summarized ERM and Cape's responses. In some cases Mr. Harrison may have addressed/responded to our concerns, but not alleviated our concerns. I've included some comments and observations to your numbered responses below:

ERM Item #2. DEQ expressed concern that 4025M is only appropriate for ascertaining the presence/absence of dioxins and furans. ERM's response included the following:

"…TEQ results from 4025M tests are therefore suitable to compare to the 2,3,7,8-TCDD TEQ and 2,3,7,8-TCDD screening concentrations in DEQ guidance for human Health and ecological risk assessments."

The 4025 results are acceptable for comparing to DEQ RBCs for the purposes we have agreed to, for planning and implementing removal actions, and for screening of post removal areas. GC/MS methods are needed for making final risk-based decisions about the protectiveness of the site/areas/decision units of the site.

ERM Item #4. ERM's response included:
"ERM and the Parties agree that a tiered site closure strategy – using a combination of sampling and analytical methods, including GC/MS and 4025M – could be used to demonstrate an adequate remedy and support a risk-based closure of the site.

DEQ just wants to be clear that while the 4025 can be useful, and could help support final closure, traditional GC/MS analytical data will need to be relied on for risk assessment and closure. We do not see 4025 data being compared against RBCs/SLVs for risk assessment/closure purposes.

It appears that there are some areas where there is still some disagreement with regard to the acceptability of Method 4025 data quality for conducting risk assessment, the uncertainty in the accuracy of TEQ values, and the lack of individual congener data from the method. That said, as described elsewhere in the memo, it seems like we are in concurrence on the most important aspects of how the existing 4025 data and how additional 4025 data may be used to help evaluate and clean up the site with the aim of attaining site closure/NFA. We feel that it would probably be most productive to move forward with the project given this level of understanding and agreement, rather than trying to attain complete agreement on all of the technical issues, which may be impossible.

SUMMARY

> *DEQ has agreed to allow use of existing 4025M to select removal actions. Additional sampling with analysis by 4025M or GC/MS methods may support remedy selection.*

DEQ note: To be clear, 4025 data will be helpful in scoping and determining adequacy of removal actions. While there may be a place for 4025 data to support "remedy selection", we want to manage expectations and clarify some terms we use. Remedy Selection usually implies a final remedial action (not a removal). Unlike removal actions, remedial actions are actions that are selected to address risks identified in baseline human health and ecological risk assessments. The risk assessment process will require individual congener data and GC/MS data for dioxins. Remedial action alternatives are usually evaluated in a Feasibility Study. DEQ's recommended remedial alternative is then put out for public comment in a Staff Report for 30 days. Once public comment and public involvement is completed and comments are addressed, DEQ issues a Record of Decision (ROD) that prescribes the remedial action (remedy). The remedy is then implemented under an order or Judgment.

It is possible that once removal actions are complete, that no further remedial action would be needed at the site (this is in essence the definition of an NFA). However, for this to occur, human health and ecological risk assessments will need to be completed to demonstrate there are no exceedances of DEQ's acceptable risk levels, using traditional GC/MS sampling data.

NEXT STEPS

Part 1 – Scoping:

This step could also be referred to as Data Gaps Assessment. When thinking about this step it would be helpful for your team to think about the site, which parts are desired for cleanup and eventual site closure, and then make sure you cover the points in your Scoping step so you have enough information about these areas to arrive at your desired outcome successfully. Keep in mind that there could be a large difference in DEQ's eyes between areas 1) that may not warrant a removal action and 2) an area that is ready for NFA. Just because an area may not seem like it is contaminated enough to devote resources for a removal action doesn't mean it is ready for closure. If areas are thought not to be good candidates for removal action and are areas desired to eventually be closed, you should be evaluating if there are enough data of risk assessment quality (not 4025 data) to allow you to demonstrate that.

Part 2 – Design and Implement Removal Action

Part II of your Next Steps includes completing risk assessment (Part II, Step #4). We think that the risk assessments (baseline human health and ecological) will likely be significant steps in the project and recommend you plan on a separate phase (or Part) of your project. The results of the risk assessment will determine if the site is ready for Site Closure.

December 16, 2019

Adair Village conference call summary notes, 11/14/19 Conference Call, 0915-approx 1015

Participants: Don Hanson, Susan Turnblom, Jennifer Peterson, Mike Kucinski – ODEQ

David Weyman, Mike Hassett, Mark Shibata, Kim Marcus – ERM

Noelle Wooten – attorney, Nelson Mullens

Bob Harrison – Cape Technologies

Purpose of Call: The purpose of the call was to provide GA Pacific and their team (specifically Cape Technologies) an opportunity to defend the use of the EPA Method 4025 immunoassay screening data to evaluate risk at the site. Much of the call involved Bob Harrison of CT, describing his years of experience developing and using the 4025 method for analysis of dioxin TEQ.

Method 4025 is a small molecule immunoassay method originally developed for PCBs, which was augmented to also detect dioxin/furans.

Streamlined Cleanup techniques for the method, Method 4025M, proprietary. The original method has been improved with a modified version developed to add a cleanup step to remove interfering compounds (4025 M). However, the modified method has not been validated by EPA or updated on the SW-846 website. Apparently the modified method used by GeoEngineers during their Brownfield sampling activities at the Adair Village site.

4025M is an antibody method, not based on structure recognition. This antibody reaction is correlated with dioxin TEQ (mammalian?) This correlation is an important distinction rather than measuring TEQ concentration. The antibody assay is not as strong at recognizing dioxin like furans.

The modified method allows for achieving better method detection limits using Method 4025, however, it is unknown if it improves the false negatives, and there is an absence of congener data. The result provided is only for dioxin TEQ.

Because this method only gives a dioxin TEQ result, and therefore is intended to compare to a TEQ screening value. Jennifer noted that the most accurate measure of TEQ is identification and quantification of the dioxin / furan congeners and subsequent calculation of TEQ. Additionally, bird and fish TEQ is not distinguished with this method.

Jennifer described that DEQ's Bioaccumulative SLVs are congener specific, and therefore congener data and associated physical chemical properties are needed to screen for bioaccumulation effects. For example, see DEQ's Guidance for Assessing Bioaccumulative Chemicals in Sediment.

Assess the need for remediation/cleanup, potential interference??

DEQ discussed the complexity of the site. We consider this site moderately complex to complex given the site setting, potential for ecological receptors, and the contaminants. Because of this DEQ's RBCs for

2,3,7,8-TCDD dioxin equivalents can't be used exclusively for this project. This is in part due to the need to look at individual congeners for the ecological risk evaluation.

JP noted that the method does not provide definitive congener identification and quantification. QA is not as rigorous as 8290 or 1613b. The 4025 method is a screening data method according to EPA, as compared to a definitive method. This means it is not definitive in terms of the identification of compounds present, e.g. determination by a mass spectrometer, and it is not definitive in terms of quality assurance around the quantitation of the chemicals present. The method is known to have high levels of false negatives (low or non-detect results when high levels of dioxin / furan congeners are present). While not specifically discussed in the call, according to Ned at the DEQ Lab, the only way you would know if there were false negatives would be to serially dilute the samples and then analyze with 4025 to ensure you achieve the expected result. Otherwise, based on a review of the results and any QA, one would not be able to detect the presence of false negatives. The fact that the false negatives occur at high concentrations (noted in the method description as well, http://www.caslab.com/EPA-Methods/PDF/EPA-Method-4025.pdf, Table 5) is particularly problematic. However, as far as DEQ can tell, dilution to test for false negatives this was not conducted in the previous use of Method 4025 at this site. Based on the laboratory's review, it should be done in the future if Method 4025 is used, as well as some co-located 4025 / 1613 data.

According to EPA, screening level data should not be used for risk assessment or decision-making (Guidance for Data Usability in Risk Assessment, 1991; Superfund CLP National Functional Guidelines). Jennifer cited both of these references during our call.

DEQ mentioned that we thought that the method might be useful to determine the presence/absence if correlations between 4025 data and definitive methods such as 8290 or 1613b could be made, but not high enough quality to use to screen areas out by determining risk is acceptable, or walk away from the site. DEQ cleanup QA/QC metrics require positive identification without interferences.

Screening level methods and screening level risk assessments were both discussed on the call. It was noted that data used in conjunction with risk based concentrations to screen areas in or out for further investigation (screening level risk assessment), require high quality definitive data to make those decisions, particularly if areas are screened out for further investigation. Bob Harrison noted that SW-846 methods are guidance/guidelines, not necessarily prescriptive. These methods can be found at https://www.epa.gov/hw-sw846/basic-information-about-how-use-sw-846#UseWhich

Method 4025M recognized chemical reactivity – structure specific antibody method

Table of specificity is available on Cape Technologies web site

Acknowledged that the method is not as good at identifying furans as dioxins. Readily oxidizable compounds removed.

Mark Shibata proposed phased decision making by comparing Method 4025 data to risk based concentrations. Jennifer Peterson noted that this is risk-based decision making, and DEQ cannot agree to this approach. Alternatively, DEQ suggested that method 4025 data could be used in conjunction with 8290 / 1613b data and other lines of evidence (e.g. CSM) to identify early removal action areas. Confirmation sampling using definitive data methods could then be done to complete the risk screening to determine if acceptable risk levels have been met.

ERM stated on the call they may want to propose decision units (exposure areas) that need more work (i.e., cleanup/removal actions) (meaning they screen in above RBCs). But the flip side to that is that ERM may want to identify areas "screen out" for because they are below RBCs. Our point is that this is risk screening decision making in areas that are considered "done" (i.e. NFA) needs to be based on definitive (congener) data. In other words, they can identify removal actions and follow up with traditional definitive confirmation sampling.

A pole yards site in Maine was mentioned as an example of a site where method 4025 was used to delineate initial areas of concern; follow-up methodology including the use of definitive methods to confirm. We agreed that this approach could be considered at the Boise Adair Village site.

Bob said they provided and will provide appropriate QA as much as they can. Jennifer P. mentioned that without round robin laboratory testing that is provided in EPA review methodology, it is unclear how much the modified method improves false negative rates. The fact that false negatives occurred at the highest concentrations is a significant concern.

Method 4025 is faster at obtaining spatially distributed information on dioxin TEQ because the time to get results is faster. Obtaining better spatial distribution because of the lower cost of the analysis, advantageous timelines, and overall cost effectiveness were toted as benefits of the method. DEQ suggested that if Incremental Sampling Methodology (ISM) was used with definitive analytical methods, it could also result in significant cost savings compared with discrete, traditional sampling methodologies.

Mark Shibata wanted to know if there was something in QA/QC materials provided that indicates we can't use the data for screening? DEQ would need to see how it correlated with definitive methods, and understand what the false negative rate is. That cannot be determined by looking at the QA/QC materials.

GP wants to mitigate risk, i.e. remove material or remove/prevent exposure, and get property back into productive use. Dave Weymann seemed to indicate that they were leaning toward a "mitigating action" (i.e., removal action) approach.

Work plan for risk assessment, initial approach risk assessment. Risk based decisions should be based on definitive data. Emphasized that the work plan should identify areas of concern, and that any remedial action would need to be followed up with definitive congener data (8290 / 1613b) to evaluate for residual risk (risk assessment).

Next steps: Summarize meeting and Re-structure or re-format the risk assessment work plan