UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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CHICAGO, IL 60604-3590

January 11, 2017

To: Madelyn Adams, OEP

From: Leslie Patterson, U.S. EPA

Subject: Review of OEPA comments on the draft *Remedial Investigation/Feasibility Study (RI/FS) Work Plan for Operable Units 1 and 2*, dated July 26, 2016
South Dayton Dump & Landfill, Moraine, Ohio

As requested by Ohio EPA, this memorandum provides written explanation as to why some Ohio EPA comments have not been incorporated in EPA's comments on the PRP's RI/FS workplan. The paragraphs immediately below seek to clarify two issues in which OEPA's and EPA's approaches to managing remedial projects through the CERCLA process appear to differ. The numbered comments below excerpt the portion of each OEPA comment that specifies a deficiency and/or requests a modification to the workplan, followed by EPA's explanation for its omission in the comments on the RI/FS workplan to the PRPs. Please note that EPA requests input from OEPA on comment #54.1 for incorporation into EPA's comments to the PRPs.

If OEPA would like to discuss the contents of this memorandum further before EPA provides comments on the RI/FS Workplan to the PRPs, EPA requests that OEPA indicate its desire to do so by Monday, January 23, 2017.

Streamlining of the RI/FS: The specifics of how OEPA would like the RI/FS streamlined are unclear to EPA. OEPA comment #3 (and OEPA's recent correspondence to EPA about the PRPs' draft environmental covenant) opposes assuming that residential use of the site will be restricted, but OEPA comment #2 wants the risk assessment streamlined for obvious completed pathways (of which residential is not one) and states that OEPA's view is that a cap remedy (upon which residences, and generally, any buildings with footings, are not allowed) is most appropriate. EPA agrees that a cap and ICs to protect the cap are very likely components of the remedy for the site, but if that is the case, there is little to be gained by doing additional characterization of discrete areas of contamination that are not hot spots (as discussed in the CERCLA Landfill Guidance that OEPA references). Several OEPA comments request this additional characterization, which seems counter to the desire for streamlining.

EPA believes that with respect to most of OU1 (generally, north of the access road), the site has largely been adequately characterized, and that to streamline the RI/FS, further characterization should focus on delineating the contaminant plumes that are extending beyond OU1, gathering information that may be needed to evaluate treatment and/or excavation options for the sources of those plumes, characterizing the areas that were added to OU1 in the recent AOC, and characterizing media in OU2.

Use of soil leaching values: EPA uses soil leaching screening levels as useful tools to indicate if groundwater needs to be sampled because the soil could be acting as a source of contamination to groundwater. However, soil contamination that exceeds the screening levels (whether generic or site-specific) only indicates that it could be leaching; it does not provide information on whether it is actually leaching, the extent to which it is leaching, or whether the source that is leaching is significant enough to merit remedial action. In contrast, groundwater data actually measures the impact of leaching (or lack of it), provides an exposure point concentration input to the risk assessment, and is therefore the preferred data to answer the question of whether leaching is impacting groundwater to an unacceptable degree. Some OEPA comments suggest the possibility of leaching in areas where groundwater is well-characterized. EPA does not oppose making the comparison to leaching screening levels in the RI, but EPA will prefer relevant groundwater data to soil data in evaluating leaching.

Numbered comments

1. *The proposed investigation will not satisfy objective one [to determine the nature and extent of contamination at the Site] or three [to provide sufficient data for the identification and evaluation of remedial alternatives for the Site].*

In accordance with NCP Section 300.430(a)(2), the purpose of the RI/FS is to assess site conditions and evaluate alternatives to the extent necessary to select a remedy. The scope and timing of these activities should be tailored to the nature and complexity of the problem and the response alternatives being considered. EPA is requiring the PRPs to collect additional data to adequately satisfy the RI/FS purpose.

2. *...there is no proposal in the work plan to fully delineate the lateral and vertical extent of waste material for the purposes of implementing a cap remedy.*

The vertical extent of waste material does not impact the extent of a cap. The lateral extent of waste has been defined to the extent necessary to evaluate alternatives by historical information such as photos showing the extent of excavation and waste placement, land ownership records, and existing boring and trenching data.

3-2. *Also, existing pavement is proposed to be used to preclude direct contact to underlying soil/fill, though the inclusion of existing pavement has not been assumed to be part of a final remedy.*

The comment does not identify where this proposal is made, and EPA cannot determine where the workplan proposes this. Page 58 of the workplan discusses taking samples to "at a lower depth interval, e.g., 1- to 3 ft bgs to provide a representation of material that could be exposed if the pavement were not present", which indicates the opposite approach.

3-3. *In addition, consideration should be given to the fact that the direct contact investigation is proposed over a landfill with heterogeneous waste placement, and it may be technically infeasible to fully characterize the risks due to the heterogeneity of the waste placement and potential migration. Considering this, Ohio EPA recommends that consideration be given to streamlining the risk assessment for obvious completed pathways and remedial options.*



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There is always some uncertainty in the evaluation of contamination, risk, and remedial alternatives, and full characterization is relative to the site conditions. See the response to comment #1 for the extent of characterization needed under the NCP. EPA believes the surface material to which receptors would be likely exposed over a chronic exposure period can be adequately characterized because enough surface soil samples will be available from most exposure units to calculate 95% upper confidence limit (UCL) on the mean concentrations of detected chemicals. Where a sufficient number of samples are not available, maximum detected concentrations will be used (and samples will have been collected from locations where highest impacts are expected based on site characteristics). EPA expects to prevent direct contact to the subsurface material through institutional and engineering controls that prohibit unauthorized use and digging. EPA encourages OEPA to communicate specific ideas on how to streamline aspects of the RI/FS, including the risk assessment, as EPA also values streamlining where appropriate.

5h. *Ohio EPA recommends that total and dissolved metals be analyzed in all soil, sediment, and ground water samples and that plume contour maps be provided for these constituents.*

Groundwater concentrations as shown in plume maps are commonly understood to represent dissolved concentrations, i.e., the concentrations that are transporting freely in the groundwater under normal pH conditions. Therefore, comparisons with MCLs and other drinking water criteria are intended to be based on dissolved contaminant concentrations. Contaminants adhered to soil particles in the saturated zone (i.e., "total metals") may be appropriate to consider as groundwater exposure point concentrations, if receptors will be drinking unfiltered groundwater from potable wells. However, due to the extent of well development that occurs for a potable well, it is unlikely that the potable water quality in a well would be represented by "dissolved metals". Finally, EPA does not understand the recommendation to analyze dissolved metals in soil and sediment samples.

8. *Section 1.2, page 4, first paragraph. The parcels to the south of the landfill have now been developed. Please ensure updated maps are being used and update the text.*

The parcel that lies south of the site appears to be undeveloped along the portion that borders the site. Therefore, it is correct to say that OU1 is bounded "to the south by undeveloped land with industrial facilities beyond."

12. *...revise the work plan to propose sampling perched ground water to evaluate leaching.*

The workplan (section 2.2.4, 2nd bullet) describes the investigation findings that support the characterization of the perched groundwater as localized and of low volume. Considering the permeable nature of the soil, fill and waste materials at the site, it is very unlikely that significant perched groundwater exists. Perched groundwater, if found, will be sampled as has been done in previous investigations.

14-1. *Section 2.2.4, page 27, first bullet. The text discusses that composite samples on various parts of the landfill contained lead at concentrations above acceptable toxicity characteristic leaching procedure (TCLP) levels and that 20 out of 41 samples had concentrations of COCs greater than SSLs protective of ground water. However, the text*



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*then discusses that filtered ground water samples did not exceed MCL regional screening levels (RSLs), except at VAS-11, 24, 26, and 27 and because of that, leaching of arsenic and lead is not a significant issue at the Site.*

*Limited characterization of the nature and extent of lead has been conducted, and the TCLP testing that has been done does not appear to be representative of the highest lead concentrations from previous sampling. This is a data gap that should be addressed by conducting additional TCLP testing and leachate sampling. Please delete the statement about leaching of lead not being a significant issue, and revise the work plan to include additional characterization of lead concentrations.*

Given the heterogeneous nature of the materials in the site, EPA believes it is unrealistic to evaluate lead leaching risks by performing TCLP sampling on soil/fill/waste. More importantly, this sampling is unnecessary because a significant amount of groundwater data exists, and more is planning on being collected, which will directly inform the agencies of the risks to groundwater from lead. Filtered water samples would be appropriate to consider when evaluating the extent to which leaching is occurring, and as OEPA's comments notes, largely are below MCLs. Nonetheless, total and dissolved metals will be analyzed in groundwater, so the change to the workplan identified here is not needed.

14-2. *Filtering of ground water samples is not acceptable, unless proper well development and sampling procedures have been followed. Please follow Ohio EPA's Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (February 1995).*

The PRPs will follow the SOP for groundwater sampling in the approved QAPP (development and stabilization is a standard). See the response to Comment #5h.

19. *The text discusses that the Sudan IV dye test, which was used to screen soil to determine the presence of non-aqueous phase liquids (NAPL), was not able to detect NAPL concentrations to the screening levels. The screening levels ranged from 45 mg/kg to 350,000 mg/kg and the lowest the dye test could detect to was 500 mg/kg. Is there a better screening tool that can be used to reach the screening level for determining the presence of NAPL? Is there a way to ensure NAPL is not being missed?*

The Sudan IV dye test is intended to be qualitative and is a useful approach because it gives information on residual NAPL, is inexpensive, and is easily implemented. Unless there is mobile NAPL, there is little to be gained from more involved methods such as TarGOST, but quantitative data on NAPL compounds will be collected through laboratory analyses. In addition, field observations will provide additional screening-level information on the presence of NAPL.

20. *Section 2.2.10.1, page 42, first bullet. The bullet point discusses that the available data does not allow quantification of light non-aqueous phase liquid (LNAPL) recoverability in a standardized manner. However, the bullet then states that the LNAPL is likely to be considered de minimis and concludes that LNAPL is present at residual saturation levels and will remain immobile and unrecoverable. This is not justified by the data that has been collected (as noted in the text). Whether or not it is feasible to recover NAPL should*



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*be evaluated in the Feasibility Study (FS). Please indicate in the text that additional data will be collected to further evaluate the nature and extent of NAPL.*

OEPA is correct that the recoverability of the NAPL would be evaluated in the FS. EPA considers the bail-down test that was performed adequate to inform this evaluation for this NAPL.

21b. *Section 2.3.1 data gap: Limited characterization of the nature and extent of lead concentrations detected at test trench (TT) -5, TT-7, TT-19, TT-20, TT-21, TT-22, and TT-23.*

There are three reasons why additional characterization may be desirable: 1) to evaluate leaching potential, 2) to characterize direct contact risk to human health, and 3) to develop and evaluate remedial alternatives. The value of collecting additional characterization information to evaluate the leaching pathway (1) is unnecessary as groundwater will be evaluated directly by groundwater data. Direct contact threats to human health (2) are primarily associated with surface concentrations, not concentrations at test trench depths discussed in the comment. With respect to characterization in support of remedial alternatives (3), the heterogeneous nature of the materials in the site and the discontinuity in the areas of elevated lead indicate both that excavation is a very unlikely remedy and that it is unrealistic to try to delineate all areas of elevated lead concentrations. An IC would be effective at preventing exposure, and is a much more likely remedy for which additional characterization is unnecessary.

21c. *Section 2.3.1 data gap: Limited characterization of asbestos identified at VAS-05.*

The response is similar to the response to comment 21b. Threats to human health would primarily be associated with asbestos at the surface, not at 7 ft BGS, as was found at VAS-05. The heterogeneous nature of the materials at the site indicates both that excavation is a very unlikely remedy and that it is unrealistic to try to delineate all areas with asbestos. An IC would be effective at preventing exposure, and is a much more likely remedy for which additional characterization is unnecessary.

21d. *Section 2.3.1 data gap: Limited characterization of polychlorinated biphenyls (PCBs) detected at TT-7 and TT-19.*

The response is similar to the response to comment 21b. The data for TT7 and TT-19 are presented below:

| Parameter | Residential RSL | Industrial RSL | TT-7, 6 ft | TT-7, 16 ft | TT-19, 7 ft | TT-19, 9 ft |
|---|---|---|---|---|---|---|
| Aroclor-1242 (PCB-1242) | 0.24 | 1 | 1.7 | 15 | <1.8 | <0.035 |
| Aroclor-1248 (PCB-1248) | 0.24 | 1 | <0.21 | <4.2 | 8.1 | <0.056 |
| Aroclor-1254 (PCB-1254) | 0.11 | 1 | 1.6 | 4.7 | <1.8 | <0.035 |
| Aroclor-1260 (PCB-1260) | 0.24 | 1 | <0.21 | 4.2 | 1.3 J | <0.035 |



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Certainly, PCBs were detected at these locations at concentrations above the residential and industrial RSLs. However, the value of collecting additional characterization information is unclear. Threats to groundwater will be evaluated by groundwater data, while threats to human health would primarily be associated with concentrations at the surface, not at test trench depths. Given the heterogeneous nature of the materials in the site and the discontinuity in the areas of elevated PCB concentrations indicate both that excavation is a very unlikely remedy and that it is unrealistic to try to delineate all areas with PCBs.

21e. *Section 2.3.1 data gap: Limited characterization of ethylbenzene, PCBs, pesticides, and lead at TT-9.*

See the responses to comments #21b-d and the hot spot discussion in the introductory remarks of this document.

21f. *Section 2.3.1 data gap: The most recent sub-slab concentrations at SS-14-E were higher than previous results, and the nearest soil vapor probe hasn't been sampled since 2009. Elevated concentrations of ethylbenzene have also been detected in soil in the vicinity of building 14 at BH66-13, BH67-13, and TT-9 to the south/southwest. There is a lack of soil, ground water, and soil gas data near SS-14-E. Soil, ground water, and soil gas sampling should be conducted near building 14 to address this data gap.*

EPA is commenting that all existing gas probes should be sampled in Phase 1 of the fieldwork. With respect to soil and groundwater sampling, there are three soil and groundwater sample locations within 50' of building 14, and another 2 or 3 are within 100 feet. This is adequate.

22a. *Section 2.3.2 data gap: Limited characterization of the nature and extent of waste/contamination in the vicinity of the ACD, Large Pond, and Small Pond. Sampling from the 1990s has identified polyaromatic hydrocarbons (PAHs), lead, and PCBs.*

See the responses to comments #21b-d.

22b. *Section 2.3.2 data gap: Limited characterization of the nature and extent of PCBs and pesticides detected at S3, S7, S09, TP-05, and TT-4.*

See the responses to comments #21b-d.

22c. *Section 2.3.2 data gap: Limited characterization of the nature and extent of lead detected at S3, S4, S7, S8, S10, S11, TP-1, TP-3, TP-4, and TP-5.*

See the responses to comments #21b-d.

22d. *Section 2.3.2 data gap: Lack of ground water data to evaluate the nature and extent of trichloroethene (TCE) detected at BH90-13.*

BH90-13 TCE was less than 1 µg/L (Figure 2.20a and Table B.23). This is well below the MCL.

22e. *Section 2.3.2 data gap: TCE has been detected at VAS-15 above an industrial vapor intrusion screening level (VISL), and soil gas sampling has not been performed in this*



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*area. Section 2.2.5.1 also indicates that TCE was detected in indoor air at a concentration of 50 parts per billion by volume (ppbv) in building 16, and a mitigation system was not installed as part of the removal action. A soil gas probe should be installed near VAS-15 to address this data gap.*

GP-3 is within about 50 feet of VAS-15.

27. *Section 2.2.5.1, page 32, paragraph 1. The work plan states that the indoor air and methane screening levels issued by ODH in 2012 continue to apply for evaluation of analytical results. Also, the data quality objectives for the soil gas investigation indicate that ODH Residential and Industrial Acton Levels will be used. While ODH screening or action levels may be applicable when determining if there is an immediate concern to a receptor that may need a prompt response, the ODH screening and action levels have no bearing on investigating and evaluating subsurface conditions for the purposes of implementing a final remedy. Please revise applicable DQOs and text to discuss appropriate action levels for evaluating subsurface conditions for the vapor intrusion pathway for the purposes of implementing a final remedy.*

This section is discussing subslab and indoor air samples, not general subsurface conditions. EPA included a comment on the soil gas DQO table to remove ODH Action Levels unless comparing to subslab or indoor air samples.

31. *Section 3.1, page 46, second bullet. The text indicates that the indoor air pathway is to be addressed as part of vapor intrusion studies including workers and residents associated with various buildings within and outside of OU1 as discussed in Section 2.2.5. The work plan indicates that some areas that were part of the vapor intrusion studies haven't been sampled since 2009. Additional vapor intrusion sampling may be necessary to evaluate current conditions and potential temporal variation. Areas where additional sampling may be necessary include, but are not limited to, building 16, building 23, and the trailer park. More data gaps regarding vapor intrusion are discussed in comment 20.*

With respect to VI in onsite and nearby buildings, EPA does not agree that the 2009 data are not indicative of current conditions because the site is exactly the same as it was in 2009, with the exception of some mitigation systems having been installed. Therefore, EPA is not requesting that all the sampling in 2009 be repeated. However, EPA is requiring sampling from existing gas probes.

32b. *The CSM indicates that direct contact to surface soil as well as surface water and sediments from contaminated storm water is not applicable to temporary workers and trespassers for the Quarry Pond. These pathways should be identified as potentially complete exposure pathways based on access to the Quarry Pond.*

Once stormwater runoff enters the Quarry Pond, it is no longer stormwater runoff. It becomes part of the surface water and sediment in the Quarry Pond. This is reflected in the "Quarry Pond" secondary source on Figure 3.1a, which has storm water runoff as the release mechanism, and identifies temporary workers and trespassers as receptors.



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32d. *Residents/workers, temporary workers, and trespassers have not been identified as potentially complete exposure pathway for effects by the Quarry Pond at properties outside of OU1. Part of the Quarry Pond is outside of OU1, therefore these pathways need to be evaluated.*

EPA interprets "Properties outside OU1" to mean land outside OU1, separate from the Quarry Pond. EPA does not expect people to live or have permanent jobs in the Quarry Pond, so it seems appropriate to exclude these receptors from the Quarry Pond. Contrary to the comment, temporary workers and trespassers are included as receptors for the Quarry Pond.

32e. *The Quarry Pond may overflow into the GMR and floodplain and there may be ground water influence from the Quarry Pond to the GMR and floodplain. Please include these pathways as necessary to evaluate.*

The scenario described is addressed in that groundwater and surface water runoff are already identified as release mechanisms to which the GMR/floodplain receptors may be exposed.

34. *Figure 3.2 depicts the proposed EUs. The proposed EUs do not appear to take into account how trespassers may access the Quarry Pond and how receptors may traverse the entire length of the site along the recreational trail. EUs are risk assessment areas that are determined on the basis of land use and how the receptor is expected to move and be exposed to media, rather than on sources of contamination. Therefore, the very nature of EUs implies little to no movement between different EUs. While ownership may play a role in how some parcels are used, it may not be the sole factor that influences land use and receptor movement, especially in areas where a trespasser receptor is more likely (i.e., in areas around the Quarry Pond and along the recreational trail). Risk Assessment Guidance for Superfund (RAGS) A indicates that risk assessment may need to consider cumulative risk across multiple exposure pathways if there is a potential for exposure to multiple media at the same time. It is reasonable to assume a trespasser would be exposed to contaminated soil in parcels surrounding the Quarry Pond as well as to contaminated surface water and sediment in the Quarry Pond. Therefore, the hazard and risk of these exposure pathways should be summed in the baseline risk assessment to determine the cumulative risk to a trespasser receptor. It also does not appear to be appropriate to evaluate the large and small pond (i.e., EU 18) or the access road area (i.e., EU 9) separate from the central portion of the landfill (i.e., EU 19), because receptors would have to traverse through EU 9 to get to EU 19 and through EU 19 to get to EU 18.*

*Please revise the proposed exposure units appropriately to account for receptor movement and the potential for cumulative risk across multiple exposure pathways."*

Risk assessments in which the exposure for a receptor who spends time in multiple EUs is calculated by assuming a certain amount of time spent in different EUS and adding the multiple exposures together is not unprecedented. There are additional potential combinations than the ones identified in comment 34; for example, you could have a receptor who trespasses on the landfill and works at an on-site business. EUs cannot be defined to account for all the different possibilities, so it makes sense to identify the combinations of activities that will contribute to



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exposures from different media and EUs and add them together to get the total risk for those receptors. The assumptions for those receptors who spend time in multiple EUs will be developed during the risk assessment.

35. *Section 4.2.3, page 53, third bullet, alternatives for OU1. Alternative three lists soil cover/capping, Landfill Gas (LFG) Venting, Monitoring and Institutional Controls (including sub-alternatives for variation in capping limits and types) as potential remedial alternatives. Under the new administrative settlement agreement and order on consent (ASAOC), the boundary of OU1 was determined because it included the northern area of the landfill that was a household waste landfill and the rest of the landfill that was licensed as a solid waste landfill. Ohio EPA considers all of OU1 to be subject to the landfill closure requirements set forth in OAC 3745-27: the closure requirements are directly applicable to the central, Dryden Road business, Quarry Pond, and Jim City and Barnett parcels as these areas were identified in the original landfill license application. The northern parcels were identified in the landfill license application but had already been landfilled, therefore the closure requirements would be relevant and appropriate as opposed to directly applicable. The closure requirements do not allow for variances in the cap based on waste type. Rather, variances can be granted if it can be shown that waste is not present on a licensed area, or if the waste is removed. In such circumstances the area in question wouldn't require the landfill cap and the capped area could be limited. The type of cap, would be required to follow the requirements under OAC 3745-27. This determination was provided through electronic correspondence by USEPA to the potentially responsible parties on March 24, 2014. Ohio EPA provided further discussion on this topic to USEPA on September 30, 2014.*

This comment does not identify a deficiency in the workplan.

36. *Considering the CERCLA Landfill Guidance, fully delineating the characteristics of waste in a mixed waste landfill is not possible due to the heterogeneity of the waste. Nevertheless, to attempt this, the investigation required should not be based on EUs. Rather, the investigation should be a gridded approach over the entirety of the landfill to determine the lateral and vertical extent of the waste placement and should include test trenching around the perimeter of the landfill to confirm the lateral extent of waste. It is also necessary to take samples of the waste to determine chemical characteristics. This sampling effort may need to extend into OU2 depending on whether waste was placed beyond the boundary of OU1. Such an approach should produce sufficient data for a baseline risk assessment, provided that the DQOs, Field Sampling Plan (FSP), and Quality Assurance Project Plan (QAPP) are developed to ensure data of sufficient quality for risk assessment. Under the current work plan, no further waste characterization has been proposed. The proposed actions of the soil/fill investigation are based off of running a risk assessment, not fully delineating the nature and extent of waste, as required by Task 3 of the SOW.*

    *a) Information should be provided to show the extents of waste. If the extent has not been delineated, additional investigation as described above should be proposed to determine the waste extents.*



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*b) Consideration should be given to collecting data to evaluate ... hot spot removal options in the FS.*

*c) The background/historic investigation sections discuss that some waste delineation has been done through historic sampling and through depositions from previous workers. A vertical profile and contour map of waste depth and extent will help to identify areas that need further characterization.*

*d) Please clarify which areas of the Site have been fully characterized for lateral and vertical extent of waste material. Based on information provided in Section 2.2.1 and in Figure 2.2, there are areas where the waste has not been delineated or where information is not provided to justify the extent of the waste. For example, it was stated in Section 2.2.1 that hazardous waste materials were identified in a composite sample from test trenches 1, 3, and 4; however, it is unclear if the trenches are considered the extent of the waste or if additional waste material is buried in the direction of the Recreational Trail and the GMR."*

Sites are investigated to the extent necessary to evaluate the risks to human health and the environment and develop and evaluate remedial alternatives. With respect to the lateral extent of waste, EPA believes that the aerial photos dating back several decades, historical ownership information, trenching/boring done to date, and the presence of the levee, are sufficient to conclude that lateral extent of landfilling is adequately defined for the purpose of evaluating remedial alternatives. A discussion of the findings in the near-edge test trenches and the confidence in the waste boundary is appropriate to include in the workplan and is included as an EPA comment to the PRPs. With respect to the vertical extent of non-native material, see Figure 2.2. Page 53 of the workplan outlines the process for identifying additional data needed to evaluate remedial alternatives, including treatment of principal threat waste.

37. *Section 5.2, page 57, third paragraph. This paragraph discusses the sample goals for Phase IA of the soil/fill investigation on OU1 and lists direct contact, inhalation, and ingestion risks as data goals. However, later sections and corresponding DQO tables state that the soil/fill investigation will also evaluate leaching and soil vapor/landfill gas potential. The proposed sampling on the EUs does not provide justification for sample location, depth, and number and does not constitute a leaching, soil gas, or landfill gas investigation (per OAC 3745-27-12).*

    *There is limited waste characterization proposed in the soil/fill investigation. The proposed sample number and location are not adequate to make a determination of whether or not further ground water, soil gas, and landfill gas characterization is needed. According to the information provided in section 2, enough information exists to indicate that these investigations are necessary. Please provide a proposal for these investigations.*

Although Phase I of the soil/fill, groundwater, and soil gas investigations will use much of the same data, they have different goals, and EPA considers it is appropriate to identify those goals in their respective sections of the workplan. EPA is including comments to make the soil gas investigation more robust, but areas of groundwater leaching in OU1 are already known from the



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groundwater data available. The significant amount of soil gas and groundwater data already collected indicate that there are areas of groundwater contamination and soil gas exceedences, which EPA is directing the PRPs to investigate.

40. *Due to the large quantity of detected anomalies depicted on Figures 2.1a-2.1c and to ensure that all potential hot spots are characterized, Ohio EPA requests that additional documentation be submitted (i.e., naming the anomalies, summary table of anomalies that have been investigated, need to be investigated, etc.) to support the proposed soil boring and trench locations. If anomalies have not been investigated previously, they should be investigated now as part of a comprehensive effort to fully delineate the nature and extent of waste and contamination.*

Historical information indicates that a variety of materials were accepted at the SDD&L, many of which could cause magnetic anomalies. The anomalies cover the entirety of OU1, and it is not appropriate to trench and bore through the entire landfill. The presence of mobile source material is indicated by the groundwater contaminant plumes that are migrating outside of OU1; EPA is directing that these sources to these groundwater plumes should be investigated as potential hot spots.

42. *DQO Table 5.1, Step 7, Phase 1A. The DQO table states, "A minimum of 8 samples per exposure area, per USEPA's ProUCL Technical Guide (2013), spaced on a regular grid with random origin (i.e., systematic random sampling design), will be obtained for each exposure area identified in the risk assessment." While it is important to ensure that a dataset meets the requirements for ProUCL for the purposes of determining an exposure point concentration (EPC), relying on these data requirements is not appropriate for determining the number of samples that will be representative for determining the nature and extent of contamination. Visual Sampling Plan (VSP) is a software program that that may be used to determine the number of samples needed to ensure a representative dataset within the sampling area and to develop a defensible sampling plan. Furthermore, a random sampling design is not appropriate for defining sources of contamination, determining the nature and extent of contamination, and defining site physical and environmental characteristics. For example, 8 randomly placed surface soil samples would not be sufficient for evaluating existing cover conditions and adequacy of existing soil material for potential incorporation into a remedy. It would be more appropriate to focus surface soil investigation on areas of potential leachate seeps, stains and other discoloration, and stressed vegetation. Collecting data based on previous investigations, historical site information, and current physical and environmental characteristic would produce data that would be more representative of potential exposure to existing conditions in a baseline risk assessment. Random samples do not take into account information from previous investigations, which have identified exposed waste at the surface. The work plan should determine the number and location of samples to be collected in a manner that is appropriate for defining sources of contamination, determining the nature and extent of contamination, and defining physical and environmental characteristics as required by the SOW. Please revise the work plan to propose an appropriate sampling strategy for completing the requirements of Task 3 of the SOW.*



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The significant amount of data (analytic, historical, geophysical, visual) collected to date indicate that the nature of soil contamination is VOCs, SVOCs, PCBs, pesticides, and metals (See Section 2.2.3). The source of contamination appears to be the wide variety of different materials placed in the landfill, which are known from test trenches, test pits, borings, and documented depositions. With respect to the extent of soil contamination, because exceedances of screening levels appear to be widespread and discontinuous in OU1, it is not realistic to delineate the extent of each localized area of soil contamination and is unnecessary for remedy evaluation. The exception is where soil contamination is acting as a source for groundwater contamination; however, that investigation is not described in Table 5.1, it is part of Table 5.6. Therefore, the main question remaining with respect to OU1 soil/fill is to evaluate human health/ecological risks.

OU2 has been less investigated than has OU1, so nature and extent of contamination is not as well known. EPA is requiring the PRPs to propose soil samples on the East River Road properties adjacent to EUs 3, 4, 5, 6, and 8, and on parcel 3274. EPA believes the proposed samples in the floodplain (Figure 5.3) may be sufficient to answer the question of whether site contaminants have migrated to these areas; if the answer is yes, additional sampling will likely be needed to determine the extent and to refine the remedial alternatives being considered.

43. *Ohio EPA recommends that laboratory results from all soil samples be compared to U.S. EPA SSLs and Ohio EPA LBSVs. For source characterization, please add these comparisons to the text and DQO tables.*

EPA is directing the PRPs to compare all soil samples to SSLs and LBSVs, but disagrees that this comparison is useful to characterize source areas of known groundwater plumes. Comparison to SSLs and LBSVs is useful for areas with little groundwater data to identify where leaching may be causing groundwater plumes. Where groundwater plumes are already known, the leaching screening values are not needed. Where enough groundwater data exist to rule out contaminated groundwater, those data demonstrate that leaching is not a problem, even if soil concentrations exceed screening levels.

47. *Deep soil borings (i.e., to the water table) are needed as part of the GMR floodplain investigation in order to characterize the extent of waste near the Recreational Trail. The purpose of soil sampling in this area should be to determine the lateral and vertical extents of waste and not just to evaluate direct contact risk. Determining the lateral and vertical extent of waste is a data gap that must be investigated on the floodplain as historic documentation indicates waste was placed into the floodplain. Please revise this section to include this data gap and provide a sampling plan for investigation.*

EPA is not aware of the historic documentation OEPA references; the aerial photographs presented in Figures 1.3 through 1.8 do not appear to show either excavation or mounded material in the floodplain, and the floodplain appears undisturbed. None of the stratigraphic logs for the floodplain borings (MW-101, -102, -201, -206, -207, -227), all of which are within about 10-15 feet of the recreational trail, do not report finding any waste.

Although contaminants may have migrated outside the properties operated as a landfill/dump, generally we would not expect waste to have been placed on areas that were not owned by the



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landfill owners. The levee between the floodplain and the Grillot/Boesch property was built in the early 20th century, and Grillot/Boesch extended the levee using quarry overburden. Having the levee in place by the time SDDL began to accept waste would have been a physical barrier to placing waste in the floodplain.

In sum, EPA believes the question of waste near the recreational trail has been satisfactorily answered, and that migration of contaminants to surface soil (as well as delineation of any groundwater plumes, which is described in Section 5.7) remains as a data gap.

49b-1. *The DQOs in Table 5.6 are inconsistent regarding how ground water concentrations will be evaluated. Therefore, reviewers could not evaluate how ground water EPCs will be determined, or whether sufficient data will be collected for determining ground water EPCs. The plan appears to propose using data from two rounds of ground water samples from only new wells to evaluate ground water exposure pathways. This will not produce enough data for determining ground water EPCs as this will not provide a comprehensive view of the existing ground water plumes. Consideration should be given to contaminant concentrations in existing wells, as well as the additional data that will be provided by the new wells.*

Step 1.iv, Phase 2, states, "The proposed OU1 Phase 2A/B data <u>and any previously generated and validated data (historic monitoring wells and vertical aquifer samples [VAS])</u> (underline added by EPA) will be used to determine the extent and magnitude of groundwater contamination above action levels, and generate exposure estimates for an assessment of ingestion, dermal contact, and inhalation of groundwater contaminants." Therefore, EPA does not see how the plan appears to only use groundwater data from new wells.

49b-2. *Additionally, the DQOs indicate that ground water samples will be collected from EUs. This is inappropriate as EUs were delineated based on current use and ownership, whereas the baseline risk assessment should evaluate ground water plumes holistically. Not by EU. Please update the work plan to provide an appropriate proposal for developing the ground water EPCs.*

Table 5.6 does not mention exposure units or EUs. OEPA may be confused by the reference in Table 5.6 to "exposure areas". EPA is directing the PRP to use different language to avoid this confusion.

50. *Section 5.7 provides the framework for the proposed ground water investigation. A fundamental flaw in the proposed investigation is that it only seeks to identify ground water issues for a risk assessment and is based on EUs. It is inappropriate to base a ground water investigation off of arbitrary EUs. The horizontal and vertical extent of ground water contamination across the Site (in OU1 and OU2) and off-property must be delineated, regardless of EU boundaries. This approach should follow the appropriate CERCLA Landfill Guidance.*

Section 5.7 does not mention exposure units or EUs. It discusses "areas", which are not defined by EU's.



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50d. *The TCE and vinyl chloride plume near BH89-13 (Figures 2.20a and 2.20b). Only one temporary monitoring well is being proposed for installation near BH88-13. Additional ground water characterization is necessary in this area to properly delineate the TCE and vinyl chloride contamination.*

These plumes are surrounded by at approximately one dozen previous samples, with sample locations all along the OU1 perimeter to the east and south. Additionally, this figure shows groundwater flow to the west (where the proposed temporary well will be installed) towards the center of the site. The distance to the nearest sampling locations to the south and southwest from the center of the TCE and VC plumes is about 400 feet; if this area were not within OU1, it might be important to increase the confidence of the plume contours in this area. However, the plumes are well below the MCL for both TCE and VC at least 300 feet before the plumes reaches the OU1 boundary. In addition, the maximum concentrations in the plumes are a little over twice the MCL for TCE, and 1 order of magnitude greater than the MCL for VC, indicating relatively little source material. For all these reasons, these small plumes are expected not to extend beyond the OU1 boundary and do not need additional characterization.

50g. *Parcel 5177 (EU19). This area of the Site lacks monitoring wells and the proposed sampling is insufficient to characterize the ground water contamination. For example, tetrachloroethene (PCE), TCE, vinyl chloride, 1,1-cichloroethane, chlorobenzene, arsenic, and lead have been detected in VAS-11 (Figure 2.16b and Table B23) and the extent of this contamination has not been characterized. Because it is known that waste material was deposited on Parcel 5177 (EU19), the central portion of Parcel 5177 (EU19) may warrant additional ground water investigation.*

A review of groundwater collected to date shows that slight exceedences of MCLs or RSLs are widespread but largely localized within the landfill. EPA believes it is unrealistic to expect to delineate all these areas, especially in the central portion of the landfill. EPA will focus the additional sampling on areas where contaminant plumes are migrating outside of OU1.

50h. *The "southern" portion of the site. Ohio EPA recommends that additional monitoring wells be placed around EU4, EU6, EU7, and EU8 given the elevated soil gas results in GP09-09 and GP10-09. There should be monitoring wells placed along the property boundary in this area to monitor the potential migration of COCs off-site.*

The TCE plume in this area will be fully delineated (see EPA comments identifying this area to have groundwater sampling in the first fieldwork mobilization).

50k. *Please provide more information and a plan to address perched ground water zones. The presence of perched ground water was discussed in section 2.2.4, but has not been included as a focus of the ground water investigation. Please revise the work plan to include an approach to investigate perched ground water zones.*

The workplan (section 2.2.4, 2nd bullet) describes the investigation findings that support the characterization of the perched groundwater as localized and of low volume. Considering the permeable nature of the soil, fill and waste materials at the site, it is very unlikely that significant



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perched groundwater exists. Perched groundwater, if found, will be sampled as has been done in previous investigations.

54-1. *Please also be aware that Ohio EPA guidance states that it is generally not appropriate to sample near rail roads.*

EPA requests that OEPA provide a specific minimum distance to the railroad for inclusion as a comment to the PRPs.

64. *Section 7.0, page 74, second paragraph. The work plan proposes to conduct the baseline risk assessment in accordance with RAGS Parts A-F. While these guidance documents are applicable to conducting a risk assessment, there are additional guidance documents that discuss the use of risk assessment in the RI/FS process. Please refer to U.S. EPA's guidance documents, Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites (CERCLA Landfill Guidance) and Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA regarding ways in which the baseline risk assessment may be streamlined and the baseline risk assessment may be used to streamline the RI/FS process.*

*Section 2.6 of the CERCLA Landfill Guidance indicates that it may be possible to use preliminary information, with the addition of toxicity information or ARARs, to initiate remedial action since options for remedial action at landfill sites are often limited. This document states, "Specifically, early action may be warranted when human health or environmental standards for one or more contaminants in a given media are clearly exceeded." The executive summary of this guidance document indicates that the CSM and investigation data may be used to qualitatively identify concentrations of contaminants of concern in affected media that may pose a risk through various routes of exposure to identify pathways that are an obvious threat to human health or the environment. This approach could help determine problem areas where there is a basis for remedial action and facilitate possible early action as well as determine when a more thorough risk assessment should be conducted (i.e., where an exceedance is not readily evident based on available data). For example, previous investigations have identified exposed waste at the surface. In areas where exposed waste has been identified at the surface, it may be determined that provisions for a landfill cover are necessary, and conducting a quantitative risk assessment of direct contact exposure pathways would not be necessary. In areas where a layer of soil is present, it may be necessary to evaluate direct contact and leaching pathways to evaluate the adequacy of existing soil for incorporation into a final cover for the landfill if other remedial options (i.e., removal, consolidation, and treatment) are not feasible. This approach is consistent with Section 3.4.2.1 of U.S. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, which indicates the goal of the baseline risk assessment is to gather sufficient information to adequately and accurately characterize the potential risk from a site and conduct the risk assessment as efficiently as possible. This guidance document also indicates that the CSM may be used to focus investigation efforts, and streamline the baseline risk assessment. Ohio EPA recommends that GHD consider including a discussion of how the baseline risk assessment may be streamlined, and how the baseline risk assessment may be used to streamline the RI/FS process.*



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EPA doesn't disagree with the comment's statements about EPA guidance, and EPA appreciates the value of streamlining all aspects of the RI/FS, not just the risk assessment, when appropriate. However, the CERCLA Landfill guidance offers streamlining as a way of quickly providing the basis for early action on the most threatening areas/media of a landfill site. EPA and OEPA have been investigating this site since at least 2002; the opportunity for early action has long since passed.

Thorough risk assessments are prepared for many sites where the established standards for one or more contaminants in a given medium are clearly exceeded. For SDDL, the risk assessment may support the need for ICs, treatment/removal options to prevent groundwater contamination, remedial action in the Quarry Pond, and other potential remedial actions, even if the basis for remedial action is not immediately obvious. In addition, the enforcement challenges at this particular site may lend themselves to performing a well-documented quantitative risk assessment.

66. *Section 7.0, page 76, first paragraph. The work plan states, "Estimated cancer risks for identified exposure pathways will be considered significant when greater than the identified acceptable risk level or range (1.0E-04 to 1.0E-06), while non-carcinogenic hazard estimates will be considered significant when greater than 1." Ohio EPA uses a statewide acceptable risk level of 1.0E-05 for cumulative carcinogenic risk. Please revise the work plan to state that the FS will evaluate potential remedies for exposures above a cancer risk goal of 1E-05 and a non-cancer hazard of 1, and preliminary remediation goals may be modified based on balancing and modifying criteria as well as factors relating to uncertainty, exposure, and technical feasibility during remedy selection.*

The comment wants a revision with respect to what is planned for the FS, when this section of the workplan is about the risk assessment. EPA will consider Ohio's acceptable carcinogenic risk of $10^{-5}$ in selecting a remedial action, but it is appropriate for the risk assessment to address EPA's entire risk carcinogenic risk range.

73. *Appendix D, Section 2.3.1, page 11, second paragraph. The FSP indicates that soil samples will be collected from surface and subsurface soils for the analyses of soil physical parameters. Soil samples should also be analyzed for VOCs to determine if soil contamination may be a vapor source. Please revise the FSP to state soil samples will also be analyzed for VOCs.*

EPA does not consider bulk soil data as reliable for this purpose, but EPA will have the PRPs collect soil VOC data from all new GPs for qualitative use.



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