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| Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road North, St. Paul, MN 55155-4194 | Excavation detailed corrective action design (EDCAD) report  Petroleum Remediation Program  Guidance document 7-07b  *Doc Type: Corrective Action Design* |

**Instructions:** Complete this report to propose a detailed corrective action design for soil excavation when completed as a complex corrective action. See [Excavation of petroleum contaminated soil and tank removal sampling](https://www.pca.state.mn.us/sites/default/files/c-prp3-01.pdf)and [Corrective action design and implementation](https://www.pca.state.mn.us/sites/default/files/c-prp7-01.pdf) for more information and requirements found on the Minnesota Pollution Control Agency’s (MPCA) website at <https://www.pca.state.mn.us/waste/cleanup-guidance>. Do not revise or delete any text or questions from this report form. Items may be added if they are needed to support the corrective action design. If an item is not applicable, provide a brief explanation.

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| **MPCA Site ID:** | LS00 | **Date (mm/dd/yyyy):** |  |

Responsible party information

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Individual or corporate name: | | | |  | | | | | |
| Mailing address: | | |  | | | | | | |
| City: |  | | | | | State: |  | Zip code: |  |
| Email: | |  | | | | | | Phone: |  |
| Alternative contact name (if any): | | | | |  | | | Phone: |  |

Leak site information

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | | Phone: |  | |
| Leak site address: | | | |  | | | | | |
| City: |  | | | | State: |  | Zip code: | |  |
| County: | | |  | |  | | |  | |

Environmental professional information

*By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leak site. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in a reduction in Petrofund reimbursement. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 or Minn. R. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.*

***By typing/signing my name below****, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.*

**Signatures**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Report author(s)** | | | | |  | **Report reviewer(s)** | | | |
| Signature: | |  | | |  | Signature | |  | |
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| Title: |  | | | |  | Title: |  | | |
| Date (mm/dd/yyyy): | | |  | |  | Date (mm/dd/yyyy): | | |  |
| Signature: | |  | | |  | Signature | |  | |
|  | | *(This document has been electronically signed.)* | | |  |  | | *(This document has been electronically signed.)* | |
| Title: |  | | | |  | Title: |  | | |
| Date (mm/dd/yyyy): | | |  | |  | Date (mm/dd/yyyy): | | |  |
| Name(s) of field technician(s): | | | |  | | | | | |

**Company information**:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name: | |  | | | | | Phone: | |  |
| Mailing address: | | |  | | | | | | |
| City: |  | | | State: |  | Zip code: | |  | |

**Project manager information**:

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| --- | --- | --- | --- | --- |
| Name: |  | | | |
| Phone: |  | Email: |  |  |

## Section 1: Site conceptual model update

Include updated cumulative tables and figures from [Investigation report](https://www.pca.state.mn.us/sites/default/files/c-prp4-06.docx) in Appendix A. Include documentation of additional site investigation, site monitoring, and interim corrective actions in Appendix B. Also include copies of tables, figures, or other information from the focused investigation and/or pilot test if relevant to the site conceptual model or the detailed design in Appendix C.

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| 1. | Describe any additional site investigation, site monitoring, and/or interim corrective actions completed since the last submitted report. |
| 2. | Discuss the results of the additional site investigation, site monitoring, and/or interim corrective actions. |
| 3. | Provide an updated and comprehensive site conceptual model. |
| 4. | Provide recommendations for additional site investigation, site monitoring, and/or interim corrective actions to be completed prior to EDCAD approval, including their purpose and schedule for completion. |

## Section 2: Detailed corrective action design overview

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| 1. | If the proposed EDCAD is different than requested by the MPCA, identify the differences and explain why. |
| 2. | Identify the technical lead responsible for overseeing the design, implementation, and reporting of the corrective action. |
| 3. | Discuss the reason for the proposed corrective action. |
| 4. | Discuss the corrective action goal relative to the corrective action reason. |
| 5. | If interim corrective action was completed, describe how it complements the corrective action goal. |
| 6. | Describe how the corrective action will eliminate or reduce the risk. |
| 7. | Describe any proposed complementary corrective actions, including ongoing interim corrective actions, to be completed in association with the excavation. |

## Section 3: Target zone

Illustrate the target zone’s geometry, geology, and hydrogeology on a site map and cross sections in Section 10.

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| 1. | Identify the primary contaminant phase targeted by the excavation and describe the geometry, geology, and hydrogeology of the target zone. |
| 2. | Describe any surface or subsurface structures or conditions that could limit access to the target zone. |

## Section 4: Excavation plan

Provide a site map showing the proposed areal extent and depth contours of the final excavation and cross sections showing the soil profile, groundwater elevations, contaminant distribution, target zone, and proposed extent of excavation in Section 10.

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| 1. | Describe the excavation plan. |
| 2. | Provide the estimated in-place volume (cubic yards) of clean overburden soil to be excavated. |
| 3. | Provide the estimated in-place volume (cubic yards) of petroleum-contaminated soil to be excavated for treatment. |
| 4. | Describe how contaminated soil will be differentiated and segregated from uncontaminated soil. |
| 5. | Describe field decisions that will be used to determine the final limits of the excavation. |

## Section 5: Waste generation, handling, and disposal

Include copies of waste disposal documents, permits, and related documentation in Appendix D.

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| 1. | Provide a dewatering plan for addressing petroleum-contaminated groundwater encountered during excavation activities, including how it will be removed, handled, and disposed of. Describe any required disposal approvals or permits. If dewatering is not planned, a contingency dewatering plan must be described in the event significant volumes of petroleum-contaminated groundwater are encountered. |
| 2. | Describe how light non-aqueous phase liquid (LNAPL) encountered during excavation or dewatering activities will be recovered, handled, measured, and disposed of. |
| 3. | Describe how contaminated soil will be handled, stored, and treated or disposed of. Identify the location of the treatment/disposal facility. |
| 4. | Describe any other wastes that will be generated, the estimated waste volumes, the handling and disposal requirements, and any required discharge or disposal permits. |

## Section 6: Post-excavation soil sampling and monitoring

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| 1. | Describe post-excavation soil sampling to document contamination remaining in the sidewalls and bottom of the final excavation. |
| 2. | Discuss recommendations for post-excavation monitoring (e.g., groundwater, vapor), if applicable, to measure the success of the corrective action. |

## Section 7: Site restoration

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| 1. | Describe how excavated overburden soil will be reused as backfill, or otherwise disposed of. |
| 2. | Describe how imported clean fill will be used as backfill, and where it will be placed in the excavation. |
| 3. | Describe site restoration activities. |

## Section 8: Schedule

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| 1. | Provide a schedule for completing major activities, including any pre-excavation activities, the excavation itself, site restoration, and submittal of [Corrective action excavation report](https://www.pca.state.mn.us/sites/default/files/c-prp3-02a.doc). |

## Section 9: Cost effectiveness evaluation

Provide an updated life-cycle cost estimate in Appendix E. Include all pre-excavation, excavation, and post-excavation activities; site restoration; and reporting. Update design phase costs to reflect actual costs.

1. Summarize the updated life-cycle cost estimate below. Describe any major assumptions that were made in order to estimate costs.

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|  | **Design phase (incurred costs)** | | | |
|  | Focused investigation stage | | $ |  |
|  | Pilot test stage | | $ |  |
|  | EDCAD stage | | $ |  |
|  | Design phase subtotal | | $ |  |
|  |  | |  |  |
|  | **Implementation phase (estimated costs)** | | | |
|  | Pre-excavation stage | | $ |  |
|  | Excavation stage | | $ |  |
|  | Site restoration stage | | $ |  |
|  | Post-excavation monitoring stage | | $ |  |
|  | Implementation phase subtotal | | $ |  |
|  | | **Life-cycle cost estimate total** | **$** |  |

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| 2. | Compare the updated life-cycle cost estimate to the life-cycle cost estimates provided in [Conceptual corrective action design (CCAD) report](https://www.pca.state.mn.us/sites/default/files/c-prp7-02.docx), and if applicable, in [Pilot test report](https://www.pca.state.mn.us/sites/default/files/c-prp7-06.docx) and discuss the results of this comparison. |
| 3. | List the corrective action alternatives evaluated in the CCAD with their corresponding, and if applicable, updated life-cycle cost estimate totals. Compare the life-cycle costs of the alternatives with the updated life-cycle cost estimate of the proposed excavation. |
| 4. | Provide justification for whether the proposed excavation remains the most cost-effective alternative for achieving the corrective action goal. |

## Section 10: Figures

Attach new figures specific to this report in order of discussion in the text. All figures must include a north arrow, scale, and legend as applicable. Approximate scales are not acceptable. Figures required in Appendix A should not be included in this section. New figures must include those listed below. Attach additional figures as needed and list below. **Double click checkboxes to select *Checked* and select *OK*.**

|  |  |
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|  | One or more site maps showing (as applicable):   1. Structures 2. Boring and well locations (including any drinking water wells on site) 3. Suspected source(s) of LNAPL 4. Locations and depths of on-site buried utilities 5. All past and present petroleum storage tanks, piping, dispensers, and transfer areas 6. Horizontal extent of LNAPL 7. Horizontal extent of the target zone 8. Areal extent and depth contours of the final excavation   Distinguish sequential elements of investigations by dates, symbols, etc. in the legend. |
|  | Cross sections showing the soil profile, groundwater elevations, contaminant distribution, target zone, and proposed excavation extent. |

## Section 11: Tables

Attach new tables specific to this report in order of discussion in the text. Tables required in Appendix A should not be included in this section. List all new tables below in numerical order.

## Section 12: Appendices

Attach all required or applicable appendices in the following order. Indicate those appendices that are included in this report by marking the check box. All reproduced data must be legible. Attach additional appendices as needed and list below.

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|  | *Appendix A* | Cumulative and updated tables and figures from [Investigation report](https://www.pca.state.mn.us/sites/default/files/c-prp4-06.docx). |
|  | *Appendix B* | Additional site investigation, site monitoring, and interim corrective action methods and procedures and associated documentation (boring logs, sampling information forms, laboratory analytical reports, etc.). |
|  | *Appendix C* | Focused investigation and/or pilot test tables, figures, and other information, if applicable. |
|  | *Appendix D* | Waste handling and disposal documentation and required permit/approval applications and/or acquired permit/approvals. |
|  | *Appendix E* | Updated life-cycle cost estimate for the proposed corrective action, and if applicable, updated life-cycle costs estimates for non-selected alternatives. |