|  |  |
| --- | --- |
| Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road North, St. Paul, MN 55155-4194 | Light non-aqueous phase liquid (LNAPL) recovery report  Petroleum Remediation Program  Guidance document 2-03  *Doc Type: Free Product Recovery Worksheet* |

**Instructions:** The completion and submittal of this report fulfills federal requirements (U.S. Environmental Protection Agency) to report to the Minnesota Pollution Control Agency (MPCA) light non-aqueous phase liquid (LNAPL) recovery actions within 45 days of discovery. For further information see the [Light non-aqueous phase liquid management strategy](https://www.pca.state.mn.us/sites/default/files/c-prp2-02.pdf) found on the MPCA’s website at <https://www.pca.state.mn.us/waste/cleanup-guidance>. Contact the MPCA prior to conducting an LNAPL recovery test. Do not revise or delete any text or questions from this report form.

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

Responsible party information

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | |  | |
|  | | *(This document has been electronically signed.)* | | |  |  | | *(This document has been electronically signed.)* | |
| 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**:

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

## Section 1: LNAPL discovery

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Initial LNAPL discovery date (mm/dd/yyyy): | | | | |  | | | | Time: | | |  | am  pm | |
| 2. | **You are required to report LNAPL immediately.** Pleasecall the Minnesota duty officer at 651-649-5451 or 800-422-4798. | | | | | | | | | | | | | | |
|  | Call date (mm/dd/yyyy): | |  | | | | Call time: | |  | | | am  pm | | | |
|  | Name: |  | | | | | Affiliation of caller: | | | |  | | | | |
|  | Duty officer report number: | | | |  | | | | | | | | | | |
|  | Name and ID of duty officer: | | | |  | | | | | | | | | | |
| 3. | Provide the time period covered by information in this report. | | | | | | | | | | | | | | |
|  | Begin date (mm/dd/yyyy): | | |  | | | | End date (mm/dd/yyyy): | | | | |  | |  |
| 4. | Describe the circumstances of LNAPL discovery (e.g., where was it detected or observed, which well). Provide a site map showing where LNAPL was discovered. | | | | | | | | | | | | | | |
| 5. | Soil type | | | | | | | | | | | | | | |
| 6. | Product type (if unknown or not clear, describe the characteristics and suggest the product type) | | | | | | | | | | | | | | |
| 7. | Describe the suspected source of the LNAPL and identify on the site map | | | | | | | | | | | | | | |
| 8. | LNAPL thickness or volume detected | | | | | | | | | | | | | | |
| 9. | Describe LNAPL measurement methods and procedures | | | | | | | | | | | | | | |
| 10. | List obvious nearby receptors, including basements, utilities, water wells, etc. | | | | | | | | | | | | | | |
| 11. | Describe mobile LNAPL delineation activities completed to date and provide a site map showing the known extent of LNAPL. | | | | | | | | | | | | | | |

## Section 2: LNAPL recovery

|  |  |
| --- | --- |
| 1. | Describe in general all LNAPL recovery events in this reporting period (e.g., what was done, where was it done, duration). |
| 2. | Describe in detail LNAPL recovery methods and procedures including whether groundwater was also recovered and how recovered LNAPL was differentiated from recovered groundwater. |
| 3. | Complete Table 1. Discuss event-based and cumulative LNAPL and groundwater volumes recovered. |
| 4. | Provide observations concerning LNAPL recharge rate(s) for each impacted well. |
| 5. | If an LNAPL recovery test was performed, complete Tables 2a and 2b and include applicable figures. Describe the methods, procedures, calculations, results, and conclusions. |
| 6. | Describe how recovered LNAPL and groundwater were handled, including the disposal method and location. |
| 7. | Provide recommendations for future recovery and/or mobile LNAPL delineation activities and discuss the rationale for those activities. |

## Section 3: Figures

Attach the following figures in order of discussion in the text. All figures must include a north arrow, scale, and legend. Approximate scales are not acceptable.

|  |  |
| --- | --- |
|  | Site location map using a U.S. Geological Survey 7.5 minute quadrangle map. |
|  | 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. Extent of soil excavation 7. Horizontal extent of LNAPL   Distinguish sequential elements of investigations by dates, symbols, etc. in the legend. |
|  | LNAPL recovery test graphs showing product thickness and volume versus time during the recharge phase (Table 2b data). |

Section 4: Tables (Add additional rows as needed.)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 1  LNAPL1 Recovery | | | | | | | | | | | |
| **Recovery location**  **ID** | **Recovery date** | **Pre-recovery measurements** | | | | **Recovery method** | **Event recovery3** | | **Cumulative recovery4** | | **Comments** |
| **Depth to LNAPL (ft)** | **Depth to GW2**  **(ft)** | **LNAPL thickness**  **(ft)** | **LNAPL volume**  **(gal)** | **LNAPL**  **(gal)** | **GW**  **(gal)** | **LNAPL**  **(gal)** | **GW**  **(gal)** |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

1 LNAPL = Light non-aqueous phase liquid

2 GW = Groundwater

3 Volume recovered during individual recovery event for that location.

4 Cumulative volume recovered at each recovery location (i.e., total volume removed for all recovery events to date).

**Notes:**

Enter any notes here.

## Section 4: Tables - ***Continued*** (Add additional rows as needed.)

Table 2a

LNAPL1 recovery test – Removal phase

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Recovery location**  **ID** | **Date** | **Time**  **(HH:mm)** | **Elapsed time**  **(min)** | **Depth to LNAPL**  **(ft)** | **Depth to GW2**  **(ft)** | **LNAPL thickness**  **(ft)** | **LNAPL volume in well**  **(gal)** | **Total LNAPL removed**  **(gal)** | **Total GW**  **removed**  **(gal)** | **LNAPL**  **removal**  **rate**  **(gal/day)** | **Removal method** | **Comments** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

1 LNAPL = Light non-aqueous phase liquid

2 GW = Groundwater

Add additional rows as needed.

**Notes:**

Enter any notes here.

## Section 4: Tables - ***Continued*** (Add additional rows as needed.)

Table 2b

LNAPL1 recovery test – Recharge phase

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Recovery location**  **ID** | **Date** | **Time**  **(HH:mm)** | **Elapsed time**  **(min)** | **Depth to LNAPL (ft)** | **Depth to GW2**  **(ft)** | **LNAPL thickness**  **(ft)** | **LNAPL volume in well**  **(gal)** | **Incremental**  **LNAPL**  **recharge rate3**  **(gal/day)** | **Cumulative**  **LNAPL**  **recharge rate4**  **(gal/day)** | **Comments** |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |

1 LNAPL = Light non-aqueous phase liquid

2 GW = Groundwater

3 Incremental recharge rate is calculated using the volume recharged between two consecutive measurements and the elapsed time between those two measurements.

4 Cumulative recharge rate is calculated using the total recharged volume and the total elapsed time at that measurement. If LNAPL is present in the well at the start time (i.e., time zero), remember to subtract this initial volume from the subsequent volumes to determine the total **recharged** volume. This is only applicable to the Cumulative FP Recharge Rate calculation.

**Notes:**

Enter any notes here.

## Section 5: Appendices

Attach any appendices as needed.