APPENDIX G

A SITE-SPECIFIC RECAP EVALUATION FOR TYPICAL UST SITES AND OTHER SMALL PETROLEUM HYDROCARBON RELEASE SITES

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G1.0 APPENDIX G UNDERGROUND STORAGE TANK (UST) AND OTHER SMALL PETROLEUM RELEASES RECAP STANDARDS

Relative to sites at large facilities (landfills, RCRA facilities, chemical plants, etc.), UST sites are unique because: (1) most sites are about the same size, (2) the constituents of concern (COC) are relatively limited, (3) the sources of COC are generally limited (i.e. tank hold, pipe chase, and dispenser islands), and (4) the exposure pathways and receptors are similar. Due to these factors and the abundance of information that has been obtained from numerous UST sites in Louisiana and across the country, a site-specific MO-2 analysis of typical UST sites was conducted and RECAP Standards (RS) have been calculated for a range of conditions found at typical UST sites. This analysis is consistent with the requirements for MO-2 evaluations for all sites but uses information that will be gathered during site investigation activities at UST sites. These MO-2 RS may be used to assist in evaluation of the numerous UST sites in Louisiana. These MO-2 RS may also be used to assist in the evaluation of other types of small petroleum releases (i.e., source area is $\leq$ 0.5 acre) that meet the criteria given in Section G2.0. A more site-specific MO-2 analysis or a MO-3 analysis may be required by the Department based on site conditions. Additional guidance on addressing petroleum hydrocarbon releases is presented in Appendix D. Refer to Table D-2 for the COC for various types of petroleum hydrocarbon releases.

Appendix G Department-derived MO-2 RECAP Standards are constituent concentrations in soil and groundwater that are protective of human health and the environment. The comparison of the MO-2 Appendix G RS with the soil AOIC and/or groundwater CC serves to provide predictable, consistent guidance regarding when further evaluation and/or corrective action is warranted at a UST or other small petroleum release site. The Appendix G RS were developed for non-industrial and industrial exposure scenarios using protective assumptions with regard to the protection of human health and the prevention of cross-media transfer. The Appendix G RS comply with ARAR and consider the protection of resource aesthetics. Appendix G RS may be used to: (1) document that an AOI complies with target risk levels and hence, does not warrant further action at this time; (2) identify areas of a facility, media, or COC that warrant further evaluation or remediation using a site-specific MO-2 or MO-3 assessment.

G1.1 Site Categorization

UST and other small petroleum release sites evaluated using Appendix G shall be categorized into one of seven categories (Category 1 - Category 7) based on the site-specific fraction of organic carbon (f_{oc}) of soil representative of the vadose zone:

Fraction of Organic Carbon (f_{oc}) (Refer to Appendix B for f_{oc} Determination)	**Category**	**Table**
$\leq$ 0.006	1	G-1
> 0.006 – 0.01	2	G-2
> 0.01 – 0.02	3	G-3
> 0.02 – 0.03	4	G-4
> 0.03 – 0.04	5	G-5
> 0.04 - 0.05	6	G-6
> 0.05 – 0.06	7	G-7

The f_{oc} shall be obtained during site investigation activities from an area of unimpacted soil that is representative of the characteristics of the soil within the vadose zone of the AOI. The Appendix G MO-2 RECAP Standards for soil are presented in Category Tables G-1 through G-7 at the end of this appendix.

G1.2 General Data Requirements for an Appendix G MO-2 assessment:

(1) Horizontal and vertical boundaries of the soil and groundwater AOI;
(2) Groundwater classification of the impacted zone based on aquifer yield and TDS or using data from a nearby site as described in Section 2.3.2;
(3) Groundwater CC for each COC and identification of the POE;
(5) Depth to groundwater within the impacted zone and thickness of the groundwater plume (S_d);
(6) Distance to the nearest downgradient property boundary or the nearest downgradient location a well could be placed (if applicable);
(7) Designated use of, and distance to, the nearest downgradient surface water body (if applicable);
(8) Delineation of the soil source area within the vadose zone including source length of impacted soil within the vadose zone (L), source width of impacted soil within the vadose zone (S_w), and the soil AOIC;
(9) SPLP data for COC where it is expected that the soil to groundwater pathway will be a limiting pathway (recommended);
(10) Fraction of organic carbon (f_{oc}) present in soil representative of the vadose zone;
(11) Exposure pathways associated with current and future land use;
(12) Critical effects/target organs for each COC that elicits noncarcinogenic health effects (refer to Appendix D); and
(13) Environmental fate and transport pathways for constituent migration.
(14) When a fuel containing ethanol (E10) is released to the environment, the Department may require that ethanol be included as a COC for the site

investigation/RECAP assessment. In general, the assessment of ethanol shall include the collection of a groundwater sample from the most heavily impacted area. If warranted by site conditions, the department may require additional sampling to characterize the distribution of ethanol with in the AOI. When a fuel containing greater than 10% ethanol (e.g., E15, E20, E85, E95) is released to the environment, the Department may require that additional COC (e.g. methane) and media (e.g. soil) be addressed during site investigation/evaluation.

G2.0 CRITERIA FOR MANAGEMENT OF A UST OR OTHER SMALL PETROLEUM RELEASE SITE (SOIL AND GROUNDWATER) UNDER APPENDIX G

In order to develop Appendix G MO-2 RS, assumptions were made with regard to: (1) exposure potential at the AOC or the AOI (receptors, exposure pathways, exposure frequency and duration, intake rates, and cumulative exposures); and (2) site characteristics that influence constituent fate and transport (site size, soil characteristics, hydrogeological conditions, etc.). The application of risk-based and cross-media transfer standards is protective only if the AOI shares the same (or reasonably similar) characteristics as those assumed in the development of the standards. Therefore, the Appendix G RS are only applicable at UST or other small petroleum release sites that meet the criteria listed below.

An AOC or an AOI that meets the criteria presented below may be managed under Appendix G. Application of the Appendix G MO-2 RS at an AOC or an AOI that does not meet all of the criteria for management under MO-2 shall receive Department approval prior to submission of the MO-2 assessment. Appendix G management criteria include:

(1) A non-industrial or industrial exposure scenario is applicable at the AOC.

(2) All likely human and cross-media transfer exposure pathways associated with soil and groundwater at or adjacent to the AOC are addressed by the Appendix G MO-2 RS. Other impacted media, exposure or cross-media pathways shall be addressed under MO-3. The potential for vapor intrusion from shall be addressed in accordance with Section G5.0 and Appendix G.

(3) The impacted soil and/or groundwater under investigation are in declining conditions, i.e., the constituent mass is not increasing, the source of the release has been mitigated, and the area of constituent concentrations above the MO-2 RS is not expanding. [The environmental fate and transport models used to develop the cross-media transfer RS assume steady-state concentrations over the AOI.]

(4) NAPL is not present (i.e., If NAPL was present at the site but has been, or will be, removed to the extent practicable, the adsorbed concentrations in soil and/or the dissolved concentrations in groundwater may be addressed in the MO-2 evaluation.) [Note: The environmental fate and transport models used to develop the cross-media transfer RS assume that NAPL is not present.] MO-2 may be applied at a soil AOC/AOI where NAPL is present, if approved by the Department for the purpose of demonstrating that a CAP (refer to Section 1.2.3) is protective of human health and the environment (i.e., constituent concentrations at or reaching current or potential exposure points or cross-media transfer points are less than or equal to the MO-2 limiting RS).

(5) The area of impacted soil is approximately 0.5 acre or less. [The Q/C parameter for the calculation of the volatilization factor and particulate emission factor for

$Soil_i$ and $Soil_{ni}$ and the Summers default dilution factor for the $Soil_{gw}$ is based on an area of impacted soil that is 0.5 acre in size.]

Exceptions to this criterion:

The limiting MO-2 RS is based on a quantitation limit, the soil saturation concentration ($Soil_{sat}$), the ceiling concentration of 100,000 ppm, or an approved background concentration.

Note: If exposure and/or environmental concerns (e.g., vapor intrusion) are present at the AOI that are not addressed by the Appendix G MO-2 soil and groundwater RS then these concerns shall be addressed under an appropriate tier of assessment. If a COC is discharging via groundwater to a surface water body, then surface water, sediment, and/or biota (if applicable) shall be addressed under MO-3.

The Submitter shall demonstrate to the Department that the AOI for soil and groundwater meets the above criteria to qualify for management under Appendix G and that a site investigation has been conducted in accordance with the guidelines in Appendix B. If an AOI does not meet **all** of these criteria, then LDEQ considers the AOI to be sufficiently complex to warrant a more detailed assessment of risk and the AOI shall be addressed under a more site-specific MO-2 or MO-3 depending on site-specific conditions.

Management of an AOC/AOI under Appendix G requires that groundwater be classified in accordance with Section 2.3.2. Refer to Appendices B and F for additional guidance on classifying groundwater. Refer to Section 2.3.2.2 and Figure 6 for guidance on establishing the groundwater POC and POE. Refer to Section G3.2 for GW_1, GW_2, GW_{3DW}, and GW_{3NDW} definitions.

Different AOI within a facility may be managed under different Management Options if the areas meet the criteria for management under the Options selected by the Submitter.

An ecological checklist shall be completed (refer to Appendix C, RECAP Form 11). If the ecological checklist indicates that an ecological assessment is warranted, then an ecological risk assessment shall be required in addition to the MO-2 human health assessment.

G3.0 APPENDIX G MO-2 RECAP STANDARDS

G3.1 Soil RECAP Standards

$Soil_{ni}$ The $Soil_{ni}$ represents a constituent concentration in soil that is protective of human health for non-industrial (residential) land use. The exposure pathways addressed by the $Soil_{ni}$ include the ingestion of soil, the inhalation of volatile emissions and particulates released from soil to the ambient air, and dermal contact with soil. The $Soil_{ni}$ is applicable to surface soil and is expressed in units of mg/kg.

$Soil_{i}$ The $Soil_{i}$ represents a constituent concentration in soil that is protective of human health for industrial/commercial land use. The exposure pathways addressed by the $Soil_{i}$ include the ingestion of soil, the inhalation of volatile emissions and particulates released from soil to the ambient air, and dermal contact with soil. The $Soil_{i}$ is applicable to surface soil and is expressed in units of mg/kg.

$Soil_{GW}$ The $Soil_{GW}$ represents a constituent concentration in soil that does not result in the leaching of an unacceptable constituent concentration from soil to groundwater. The $Soil_{GW}$ shall be based on the classification of the groundwater to be protected: **$Soil_{GW1}$** shall be based on the protection of groundwater meeting the definition of Groundwater Classification 1 (the $Soil_{GW1}$ shall not result in a groundwater concentration that exceeds the GW_1); **$Soil_{GW2}$** shall be based on the protection of groundwater meeting the definition of Groundwater Classification 2 (the $Soil_{GW2}$ shall not result in a groundwater concentration that exceeds the GW_2 at the POE); **$Soil_{GW3DW}$** shall be based on the protection of groundwater meeting the definition of Groundwater Classification 3 that may potentially discharge to a surface water body designated as a drinking water source (the $Soil_{GW3DW}$ shall not result in a groundwater concentration that exceeds the GW_{3DW} at the POE); and **$Soil_{GW3NDW}$** shall be based on the protection of groundwater meeting the definition of Groundwater Classification 3 that may potentially discharge to a surface water body designated as a non-drinking water source (the $Soil_{GW3NDW}$ shall not result in a groundwater concentration that exceeds the GW_{3NDW} at the POE). The **$Soil_{GW1}$** shall not be multiplied by a dilution factor. The **$Soil_{GW2}$** shall be multiplied by a dilution factor (DF2) that accounts for the reduction in constituent concentration with groundwater migration from the POC to the nearest downgradient property boundary or the nearest downgradient location a water well can be placed (POE). The **$Soil_{GW3}$** shall be multiplied by a dilution factor (DF3) that accounts for the reduction in constituent concentration with groundwater migration from the POC to the nearest downgradient surface water body (POE). The dilution factor (DF) shall be obtained from Section G.3.3. As an alternative to the $Soil_{GW}$ RS, the soil to groundwater pathway may be evaluated using SPLP and the $Soil_{LS}$. The soil to groundwater pathway shall be evaluated for surface soil and subsurface soil. The $Soil_{GW}$ is expressed in units of mg/kg.

$Soil_{LS}$ The $Soil_{LS}$ is the soil RECAP standard that is compared to the soil leachate test result for the evaluation of the soil to groundwater pathway. The $Soil_{LS}$ is the constituent concentration (mg/l) in leachate (as determined by SPLP analysis) that is not expected to result in an unacceptable constituent concentration in groundwater. **$Soil_{LS1}$** shall not result in a groundwater concentration that exceeds the GW_1; **$Soil_{LS2}$** shall not result in a groundwater concentration that exceeds the GW_2 at the POE; **$Soil_{LS3DW}$** shall not result in a groundwater concentration that exceeds the GW_{3DW} at the POE; and **$Soil_{LS3NDW}$** shall not result in a groundwater concentration that exceeds the GW_{3NDW} at the POE. The soil leachate concentration shall be representative of the most heavily impacted soils within the AOI. A site-specific soil leachate test and the $Soil_{LS}$ may be used in place of the $Soil_{GW}$ for the evaluation of the soil to groundwater pathway. The $Soil_{LS}$ is expressed in units of mg/l.

$Soil_{sat}$ The $Soil_{sat}$ concentration represents a chemical-physical limit where saturation of the soil occurs. A constituent concentration in soil at or above the $Soil_{sat}$ indicates the potential for NAPL to be present in the soil. If the $Soil_{sat}$ is exceeded, the potential for NAPL to be present may be evaluated using an alternate approach. This approach shall address the most heavily impacted soils within the AOI and is subject to Department approval. The $Soil_{sat}$ parameter is only applicable to constituents present in a liquid phase at ambient temperatures (constituents with melting points greater than 20°C). The $Soil_{sat}$ is applicable to surface soil and subsurface soil and is expressed in units of mg/kg.

The soil RECAP Standards shall be obtained from the appropriate Category Table based on the site-specific f_{oc} (Tables G-1 through G-7).

If there are multiple constituents that elicit noncarcinogenic effects on the same target organ or have the same critical effect, then the $Soil_{ni}$ or $Soil_i$ shall be adjusted to account for additive health effects. Refer to Section 2.5.2 for further guidance and Appendix D, Table D-5 for the targets for the MO-2 RS based on noncarcinogenic health effects.

The petroleum hydrocarbon concentration in soil shall not exceed: 1) a total of 5,800 mg/kg for aliphatics C_5-C_{10} and aromatics $C_{>8}$-C_{10}; 2) a total of 13,000 mg/kg for aliphatics $C_{>10}$-C_{16} and aromatics $C_{>10}$-C_{16}; and 3) a total of 30,000 mg/kg for aliphatics $C_{>16}$-C_{35} (and $C_{>35}$) and aromatics $C_{>21}$-C_{35} without Department approval (Alaska, 2006; Brost and Devaull 2000; Fussel, et. al. 1981; Ohio EPA, 2010; Sanders 2009). Refer to Appendix D for further guidance on addressing petroleum hydrocarbon concentration limits.

The **MO-2 Soil Limiting RECAP** Standard (LRS) shall be the lowest of: 1) $Soil_{ni}$ or $Soil_i$ (adjusted for additive health effects if applicable); 2) $Soil_{GW}$ x DF (if applicable); and 3) $Soil_{sat.}$ Refer to Section G3.3 for the DF.

G3.2 Groundwater RECAP Standards

GW_1 The GW_1 represents a constituent concentration in groundwater that is protective of human health. The SDWA MCL serves as the GW_1. If a MCL is not available, then a risk-based standard serves as the GW_1. The GW_1 shall not be multiplied by a dilution factor. The exposure pathways addressed by the risk-based GW_1 include the ingestion of groundwater, dermal contact with groundwater, and the inhalation of volatile emissions associated with indoor groundwater use. The GW_1 RS is applicable to groundwater meeting the definition of Groundwater Classification 1 and is expressed in units of mg/l.

GW_2 The GW_2 represents a constituent concentration in groundwater that is protective of human health. The SDWA MCL serves as the GW_2. If a MCL is not available, then a risk-based standard serves as the GW_2. The exposure pathways addressed by the risk-based GW_2 include the ingestion of groundwater, dermal contact with groundwater, and the inhalation of volatile emissions associated with indoor groundwater use. The GW_2 shall be multiplied by a dilution factor (DF2) that accounts for the reduction in constituent concentration with groundwater migration from the source to the nearest downgradient property boundary or the nearest downgradient location a water well can be placed (POE). The dilution factor (DF2) shall be obtained from Section G3.3. The GW_2 RS is applicable to groundwater meeting the definition of Groundwater Classification 2 and is expressed in units of mg/l.

GW_3 The GW_3 represents a constituent concentration in groundwater that will not result in the cross-media transfer of a constituent from groundwater to a downgradient surface water body. The **GW_{3DW}** shall be based on the protection of a downgradient surface water that is classified as a drinking water source. The **GW_{3NDW}** shall be based on the protection of a downgradient surface water that is classified as a non-drinking water source. The GW_{3DW} or the GW_{3NDW} shall be multiplied by a dilution factor (DF3) that accounts for the reduction in constituent concentration with groundwater migration from the POC to the nearest downgradient surface water body (POE). The default dilution factor (DF3) shall be obtained from Section G3.3. A GW_3 standard shall not result in a constituent concentration in groundwater that poses unacceptable health risk for other pathways of exposure such as the inhalation of vapors in an enclosed structure do to vapor intrusion from a subsurface source. The GW_3 RS is applicable to groundwater meeting the definition of Groundwater Classification 3 and is expressed in units of mg/l.

$Water_{sol}$ The $Water_{sol}$ represents a chemical-physical limit where saturation of the water occurs. Constituent concentrations in water at or above the water solubility limit indicate a potential for NAPL to be present. The $Water_{sol}$ is expressed in units of mg/l.

The groundwater RECAP standards shall be obtained from Table G-8.

If there are multiple constituents that elicit noncarcinogenic effects on the same target organ or have the same critical effect, then the GW_1 and GW_2 shall be adjusted to account for additive health effects. A GW_1 or GW_2 based on a Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL), Treatment Technique (TT), or Taste/Odor (T/O) Advisory Level is not required to be adjusted for additive health effects. GW3 is a transport/cross-media RS and therefore does not require adjustment for additive health effects. Refer to Section 2.5.2 for additional guidance and Appendix D, Table D-5 for the noncarcinogenic health targets.

The **MO-2 Groundwater Limiting RECAP Standard (LRS)** shall be the lower of: 1) GW_1, GW_2 x DF2, or GW_3 x DF3; and 2) $Water_{sol}$. Refer to Section G3.3 for the DF.

G3.3 Appendix G MO-2 Dilution Factors

For $Soil_{GW2}$, $Soil_{GW3}$, GW_2, and GW_3, identify the Appendix G MO-2 dilution factor from the table below based on: (1) the shortest distance (X) between the source/point of compliance (POC) and the nearest downgradient point of exposure (POE); the POE for a GW 2 zone shall be the nearest downgradient property boundary or the nearest downgradient location a water well can be placed; and the POE for a GW 3 zone shall be the nearest downgradient surface water body; and (2) the source width (S_w) and the source length (L). If the distance from the source to the POE is greater than 2000 feet, then: (1) the DF for 2000 feet may be used; or (2) a site-specific dilution factor may be calculated. **Note:** If there is the potential for constituent migration to be influenced by pumping activities within the zone, then the DF values presented below are not valid and shall not be used.

Identification of the Source Width (S_w) and Length (L)

The soil source area is defined as the area of impacted soil that is serving or may serve as a source for the transfer of constituents of concern (COC) from one medium to another (e.g., soil that may release volatile emissions to air and/or leach constituents to groundwater) (refer to Section 2.3.1.4). Residual constituent concentrations in an environmental medium may serve as a source of constituent transport and/or transfer to another environmental medium. However, it should be noted that RECAP is applicable to sites that are in a declining condition (i.e., the primary source/original source of the contaminant release has been removed or mitigated and the constituent mass is not increasing). RECAP was not designed, or intended to be used to address sludges or other non-media sources. The objective of RECAP is to identify residual constituent levels in impacted media that do not pose unacceptable risk to human health or the environment.

For the identification of the Appendix G dilution factors, the soil source area is defined as the contiguous area of impacted soil within the vadose zone having COC concentrations that exceed the limiting standard applicable for the Option being implemented. The

source length (L) is defined as the longest length of the soil source area parallel to groundwater flow and source width (S_w) is defined as the longest length of the soil source area perpendicular to groundwater flow (refer to Figure G-1). For LNAPL impacted sites, the soil source area should not include the impacted soil within the zone of groundwater fluctuation or smear zone present at the soil-groundwater interface (refer to Figure G-2).

X = Distance from source (POC) to POE (feet)	**Appendix G MO-2 Longitudinal Dilution Factors (DF) (dimensionless)**			
	S_w & L =			
	30 ft x 30 ft	65 ft x 65 ft	100 ft x 100 ft	148 ft x 148 ft
0 - 50	2.8	1.2	1.0	1.0
51 - 100	9.1	2.5	1.5	1.1
101 - 150	20.0	4.7	2.4	1.5
151 - 250	53.0	12.0	5.5	2.9
251 - 500	212.0	46.0	20.0	9.4
501 – 750	476.0	102.0	44.0	20.0
751 – 1000	846.0	182.0	78.0	36.0
1001 – 1250	1321.0	283.0	121.0	56.0
1251 - 1500	1902.0	408.0	174.0	80.0
1501 - 1750	2588.0	555.0	237.0	108.0
1751 - 2000	3380.0	724.0	310.0	141.0

POC = point of compliance
POE = point of exposure
S_w = source width
L = source length

G3.4 Other Considerations in the Selection of the Limiting RECAP Standard

Refer to Section 2.5.3 of the main document for other factors that require consideration in the identification of the limiting RECAP MO-2 Standards.

G4.0 APPENDIX G MO-2 SOIL AND GROUNDWATER ASSESSMENT

G4.1 Soil

To determine if soil warrants further evaluation under Appendix G, the soil LRS shall be compared to the soil AOIC. If the AOIC exceeds the LRS, then the Submitter may: (1) remediate to the Appendix G MO-2 RS and comply with closure and/or post-closure requirements; or (2) conduct a site-specific MO-2 or MO-3 evaluation. If the AOIC is less than or equal to the LRS, then the COC does not require further evaluation. Refer to Section 2.3.1.3 for guidelines on determining the AOIC.

If SPLP testing is used in lieu of the $Soil_{GW}$ to evaluate the soil to groundwater pathway, then the SPLP testing shall be conducted on the soil sample(s) exhibiting the highest constituent concentration(s). The SPLP results shall be compared to the appropriate leachate standards as follows:

Groundwater Classification 1 Leachate Standard ($Soil_{LS1}$) = GW_1 x 20*

Groundwater Classification 2 Leachate Standard ($Soil_{LS2}$) = GW_2 x 20* x DF2**

Groundwater Classification 3 Leachate Standard ($Soil_{LS3}$) = GW_3 x 20* x DF3***

Note:

* The MO-2 default Summers Dilution Factor ($DF_{Summers}$) is 20.
** Domenico longitudinal dilution factor (DF2) for a GW 2 zone; refer to Section G3.3.
***Domenico longitudinal dilution factor (DF3) for a GW 3 zone; refer to Section G3.3.

If the SPLP results are less than or equal to leachate standard, then no further evaluation of the soil to groundwater pathway is warranted. If the leachate test results are greater than leachate standard, then further evaluation of the soil to groundwater pathway is required.

G4.2 Groundwater

To determine if groundwater warrants further evaluation, the groundwater LRS shall be compared to the groundwater CC. If the groundwater CC exceeds Appendix G MO-2 LRS, then the Submitter may: (1) remediate to the Appendix G MO-2 limiting RS and comply with closure and/or post-closure requirements; or (2) proceed with a site-specific MO-2 or MO-3 evaluation. If the CC is less than or equal to the LRS, then the COC does not require further evaluation. Refer to Section 2.3.2.4 for guidelines on determining the CC.

G5.0 APPENDIX G SUBMITTAL REQUIREMENTS

An Appendix G Management Option 2 Submittal Report shall be submitted to the Department for approval. This report shall, at a minimum, meet the submittal requirements listed below. Any variance from these requirements is subject to Department approval prior to submission of the Appendix G MO-2 Submittal Report. Refer to Appendix C for the RECAP Forms.

Submittal Requirements
RECAP Form 1 Submittal Summary
RECAP Form 2 Soil Analytical Data Summary
RECAP Form 3 Groundwater Analytical Data Summary
RECAP Form 4 Groundwater Monitoring Well Characteristics
RECAP Form 5 Groundwater Monitoring Well Sampling Event Summary
RECAP Form 6 Screening Option Summary for Soil (if applicable)
RECAP Form 7 Management Option Summary for Soil 0-15 ft bgs
RECAP Form 8 Management Option Summary for Soil > 15 ft bgs
RECAP Form 9 Screening Option Summary for Groundwater (if applicable)
RECAP Form 10 Management Option Summary for Groundwater
RECAP Form 11 Ecological Checklist
RECAP Form 12 NFA-ATT Documentation (if applicable)
RECAP Form 13 Conveyance Notice (if applicable)
RECAP Forms for the lower tiers of assessment completed for each AOI
A topographic map with AOI labeled and name of quadrangle*
A vicinity map with adjoining properties, cross streets, and land use*
A site map with all significant features*
Identification of the horizontal and vertical boundaries of the AOI for each impacted medium and a detailed AOI map with all sampling locations identified*
A description of the site including history, setting, size, geology, hydrology, and hydrogeology
Geotechnical data and soil boring logs
A description of land characteristics (such as surface water bodies) and current and future land use at and in the vicinity of the AOI including identification of receptors
The groundwater classification(s) of the zone(s) under evaluation and information used to arrive at this determination; identification of the POC, POE, and CC
A description of groundwater use at and in the vicinity (one-mile radius) of the AOI including, at a minimum, a LDNR well survey obtained within the last 12 months
Identification of all known underground utilities (≤ 15 feet bgs) within or adjacent to the AOI
Identification of the AOIC and/or CC for each COC (including all calculations and identification of the sampling locations/results used) for each AOI
Inputs, methods, and supporting calculations for submitter-derived SS and/or RS
An environmental fate and transport analysis including identification and justification of models used, a discussion on the appropriateness of the model(s) for site conditions, model outputs, boundary conditions, calibration data and sensitivity analyses, and model limitations and uncertainties
Identification of the areas/media/COC requiring further evaluation or corrective action; if recommending NFA-ATT, the basis of the recommendation
Identification of areas/media where remedial action has been conducted
Identification of landowners, lessees, and/or servitude holders

*Note: All maps must have a bar scale, legend, north arrow, contour intervals (if contoured), date data was obtained, and map date. All maps, figures, diagrams, and cross sections submitted must be legible and unless otherwise approved by the Department, not larger than 11 inches by 17 inches and must be folded to a standard report format (8.5 inches by 11 inches).