

Attachment A
Checklist for Evaluation of Overall Remediation Strategy for Petroleum Contaminated Sites with Potentially High Cleanup Costs
(Estimated to exceed \$500,000)

For any Preapproval Program Remedial Action Plan (RAP) which indicates the total estimated cleanup cost for a site will exceed \$500,000, the FDEP, or contracted local program PE responsible for review and approval of the RAP, shall complete this form and attach it to the RAP Approval Order. Consideration of the concepts described in this document should be given at the beginning of the remedial design phase and the need to evaluate the strategies below should be communicated to the consultant that is preparing the RAP at the beginning of the preparation of the RAP.

1) Alternative Closure Options

Chapter 62-770, FAC, allows a number of options for achieving site rehabilitation completion without achieving all the CTLs for soil and groundwater. These options include conducting SPLP for soil that only exceeds leachability CTLs and “speciation” (fractionation) of TRPHs for soil that only exceeds TRPH CTLs. These options should be considered for any site but are of greater importance to be considered on large and costly remediation projects. The site assessment and the RAP should be reviewed to verify that the preparer of the SAR and RAP gave consideration to these options in the development of the site cleanup strategy.

a) Does the RAP (or SAR) include a discussion of these considerations and demonstrate that the preparer of the RAP had a good understanding of the options and that the options were considered in the proposed strategy? ___ yes ___ no. *If no, a review comment on this subject should be issued with the RAP review.*

2) Phased Remediation

Are receptors currently being affected or threatened by soil or groundwater contamination? ___ yes ___ no

If no, indicate below that the following options are evaluated in the RAP:

- a) Does significant free product exist on site? ___ yes ___ no. If yes, has consideration been given to an initial phase of performing free product source removal followed by monitoring to evaluate the effect of the source removal activities on the degree and extent of dissolved phase contamination before proceeding with other remedial design? ___ yes ___ no, Page(s) of RAP ____
- b) Implement an initial phase consisting of soil source removal followed by monitoring to evaluate the effect on the degree and extent of dissolved phase contamination before proceeding with other remedial design? ___ yes ___ no, Page(s) of RAP ____

- c) Does the site have a significant downgradient dissolved phase plume? yes no. If yes, has consideration been given to an initial phase of installation of an in situ system in the source area and implement monitoring of the downgradient portion of the groundwater plume? yes no, Page(s) of RAP _____

3) Source Removal Considerations

For extensive and expensive soil excavation proposals it is appropriate to collect sufficient soil analytical data and to present the results in a manner that will allow for proper decision-making as to the extent of soil removal that is necessary. The analysis of data should include the examination of the potential to remove the more highly contaminated soil and use soil risk management options (see previous section of this checklist) for the portion of the contaminated soil area remaining. The following should be included in the RAP evaluation of soil remediation recommendations:

A greater frequency of data points of laboratory analysis results than is performed for general assessment purposes is generally appropriate to justify the scope of a large soil removal. Enough data points should be provided to delineate the horizontal and vertical extent of soil contamination in the vadose and smear zones based on lab analysis results of soil samples. Figures depicting SCTL exceedences for direct exposure and leachability should be separately provided to facilitate the consideration of risk management options. The following should be verified:

- a) Were an adequate number of representative soil samples collected for laboratory analyses to define the boundaries of soil cleanup target level exceedences? yes no. If not, supplemental soil assessment may be considered.
- b) Have separate figures of inferred boundaries for soil exceeding direct exposure and leachability soil CTLs been provided? yes no. If no, the figures should be developed.
- c) Have figures been provided that indicate exceedences of soil CTLs at different depths, which may facilitate identification of uncontaminated soil that may be stockpiled and used for backfill? yes no. If no, the figures should be developed.
- d) For areas that only exceed leachability CTLs, have the risk assessment options of performing SPLP or calculation of site-specific leachability CTLs based on soil properties been considered? yes no
- e) Do some areas of soil contamination only exceed TRPH CTLs? yes no. If yes, has “speciation” (fractionation) of TRPH soil samples been performed? yes no
- f) Has the smear zone been properly delineated based on both OVA screening and laboratory analyses, as well as consideration of historical groundwater fluctuation? yes no *[Note: Collection of samples for laboratory analyses from the saturated zone is useful in remediation decision-making as such samples may assist in identification of the boundaries of the smear zone which may contain significant contaminant mass, and the removal of which may make a significant contribution towards achieving groundwater*

CTLs. However, soil CTLs are only applicable to the unsaturated zone for the purposes of a determination of site rehabilitation completion. Exceedence of soil CTLs in the saturated zone would not prevent a site from qualifying for NFA as long as groundwater CTLs are achieved or, alternately, appropriate institutional controls for exceedence of groundwater CTLs are applied.]

g) Have all lines of evidence been considered in delineating the area of soil excavation which will optimize removal of source mass, including OVA data, laboratory analysis results compared with direct exposure and leachability CTLs, alternative closure options, the original discharge source location, how the area proposed for excavation correlates with the distribution of groundwater contamination, and use of natural attenuation to accomplish soil and groundwater cleanup after the excavation? yes no

[Consideration should be given to performing a partial excavation of the contaminated soil, focusing on the most highly contaminated area with the greatest petroleum mass, such that remaining areas of soil contamination may be reduced by natural attenuation]

h) Has deferral of remedial action with interim monitoring been evaluated to allow the performance of a source removal excavation (in conjunction with storage facility upgrade or other major facility construction or renovation) at a later time as an alternative to immediate installation of an in situ remediation system? yes no

i) If the RAP indicates that conducting a source removal prior to implementing in situ remediation could result in remediation cost savings, but in situ remediation has been proposed anyway due to reluctance of the responsible party to upgrade the system early, has owner contact letter (attachment B) been issued? yes no N/A-(if RAP indicates in situ remediation is cost-effective without performing source removal first)

4) Long Term Natural Attenuation Monitoring

a) Did the Remedial Action Plan provide consideration of long term monitoring of natural attenuation as a component of the cleanup strategy? yes no

b) If no, does the RAP indicate a multi-phased approach to site remediation in which a Level 2 natural attenuation evaluation will be included in phase two? yes no

c) Does the evaluation conform to procedures described in BPSS-11 for Level 2 evaluation of long term natural attenuation monitoring, including source mass evaluation, consideration of natural attenuation indicator parameters, and cost-effectiveness? yes no N/A-(if indicated above that the natural attenuation evaluation will be in a future phase)

Signature of reviewer (if other than PE) _____

Signature of PE (required) _____ Date _____