

ATTACHMENT 2

TECHNICAL AGREEMENTS

Dated: December 7, 2000

In connection with the Multi-Site Agreement to which this is attached, representatives of BP and the Pennsylvania Department of Environmental Protection (the Department) have reached agreement on a variety of technical issues associated with site characterization, remedial action and other aspects of Act 2 at sites in Pennsylvania. The following represent the best efforts of BP and DEP to address specific technical questions arising under Act 2, the Storage tank Act, the applicable regulations, and the Technical Guidance Manual (TGM). These Technical Agreements are to be read in the context of the laws, regulations, and the TGM. It is understood that case-specific details may warrant deviating from these agreements. These agreements are described below.

1. Site Characterization

- a) Fate and Transport Modeling: When site conditions warrant, fate and transport analysis may be used to complete site characterization when sufficient data exist (i) to calibrate the analysis, and (ii) to provide a Professional Geologist (registered with the Pennsylvania Department of State, Bureau of Professional and Occupational Affairs) with a reasonable degree of confidence in the accuracy of the characterization.
- b) Groundwater:
 - i) Site characterization for groundwater should be completed to practical quantitation limits for applicable Chemicals of Concern (“COC’s”) when potential receptors rely on groundwater as a potable source.
 - ii) Site characterization for groundwater should be completed to residential state-wide, used-aquifer health standards for applicable COCs when potential receptors do not rely on groundwater as a potable source.
 - iii) For sites where MTBE is a potential COC, the initial sampling event will utilize USEPA method 8260. Supplemental sampling events can utilize USEPA method 8021, as long as there is a confirmation round of groundwater sampling using USEPA method 8260 prior to the completion of groundwater site characterization.
 - iv) For proper site characterization, there must be a minimum of two rounds of groundwater sampling from monitoring wells.
- c) Soil:

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- i) Site characterization for soil should be completed to the applicable state-wide health standards for the applicable COCs, unless the Department and BP agree otherwise.
 - ii) Laboratory test methods specified in the DEP Technical Document, Closure Requirements for Underground Storage Tank Systems (April 1, 1998, and any amendments), must be used for site characterization for soil.
 - iii) When the presence of tanks / lines / buildings prohibit the collection of additional soil data, or when the use of previously collected data do not meet the new COC list and current laboratory analytical methods (both as defined in the DEP Technical Document, Closure Requirements for Underground Storage Tank Systems (April 1, 1998, and any amendments), the Department will approve site characterization for Pathway Elimination (in accordance with Item 2, below) when the lateral extent of COCs in soil has been determined.
2. Pathway Elimination Determination (Site Specific Standard)
- a) Pathway Eliminated
 - i) If a pathway is eliminated, no numerical remedial standards need to be developed and no demonstration of attainment sampling is necessary for that pathway. See Pennsylvania Code, Title 25, §250.404 and §250.702(b)(3)(i) and (ii).
 - b) “Direct Contact with COCs in Soil” Pathway
 - i) When tanks / lines / buildings prohibit the ability to collect soil samples necessary to completely characterize the soils, the “Direct Contact with COCs in Soil” Pathway can be eliminated if the following conditions are met:
 - a) Lateral extent of COCs within soil must be determined
 - b) A surface cap is required covering the lateral extent of COCs within the soil
 - c) A post-remediation care plan to maintain surface cap is required to obtain a release of liability.
 - d) and a deed notice or deed restriction may be necessary in order to protect future receptors, as appropriate.
 - c) “Leaching of COCs from Soil to Groundwater” Pathway
 - i) With COCs present or historically present in Groundwater

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- a) When tanks / lines / buildings prohibit the ability to collect soil samples necessary to completely characterize the soils and groundwater currently contains or historically contained COCs, the “Leaching of COCs from Soil to Groundwater” Pathway can be eliminated through a trend analysis. The analysis must be conducted from monitoring wells near the source and show decreasing concentrations of COCs with time in order to prove that COCs in soil are not contributing to the COCs in groundwater.
- ii) With no indication of COCs present or historically present in Groundwater
 - a) When tanks / lines / buildings prohibit the ability to collect soil samples necessary to completely characterize the soils and groundwater neither currently nor historically contained COCs, it must be demonstrated through groundwater monitoring near the source area that concentrations of COCs will not exceed state-wide health standards. Monitoring shall occur for a period of time as determined through fate and transport modeling of the soil to groundwater pathway (this will be site specific – a new release situation will likely require more sampling data than an older release).
 - b) Release of Liability comes at end of groundwater monitoring period and requires a post-remediation care plan for the surface cap.
 - c) A deed notice or deed restriction may be necessary in order to protect future receptors, as appropriate.

3. Demonstration of Attainment

- a) Fate and transport modeling alone cannot be used to demonstrate attainment with a chosen Act 2 numerical remedial standard. Fate and transport modeling may be used as part of a demonstration of attainment for pathway elimination (see Pennsylvania Code, Title 25, §250.702(b)(3)(i)).

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- b) Groundwater Demonstration of Attainment:
 - i) An Act 2 demonstration of attainment requires groundwater sampling from monitoring wells at the applicable point of compliance (usually the property boundary).
 - ii) The Act 2 demonstration of attainment for groundwater requires consecutive quarterly samples; this is a minimum of 8 quarterly samples, unless otherwise agreed to between the Department and BP (see Pennsylvania Code, Title 25, §250.704(d)).
 - iii) EPA laboratory method 8021 may be used to analyze for MTBE (i) for monitoring the progress of groundwater remedial activities, and (ii) for analyzing groundwater samples from groundwater wells that are not compliance wells.
 - c) An Act 2 demonstration of attainment for soil and/or groundwater must be performed using the laboratory test methods referenced in the DEP Technical Document, Closure Requirements for Underground Storage Tank Systems.
 - d) The point of compliance for soil should be determined based upon Pennsylvania Code, Title 25, §250.407.
 - e) When a site-specific numerical standard is chosen as the remedial goal, the Act 2 demonstration of attainment is made at the applicable point of compliance (usually the property boundary). However, even if attainment is demonstrated, it is necessary to evaluate other on-site pathways that exist.
 - f) When a state-wide health standard is chosen, the Act 2 demonstration of attainment is made at the applicable point of compliance (usually the property boundary).
 - g) Act 2 attainment sampling normally starts after site characterization has been complete, a remedial standard has been chosen, and the remedial action, if any, has been completed. However, site characterization sampling data may be used as part of an Act 2 demonstration of attainment, as agreed to by the Department.
4. No Further Action (NFA) Determinations
- a) The Department will issue NFA determinations in the following two circumstances:
 - i) For sites at which corrective action was completed prior to August 1, 1996, NFA determinations will be issued if analytical data from that time indicates that the sites met the appropriate corrective

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action standard in existence at the time corrective action was complete.

- ii) For sites at which corrective action was completed prior to August 16, 1997, based on the August 1, 1996 list of COCs, NFA determinations will be issued if analytical data from that time indicates that the sites met the interim state wide health standard in effect at the time the corrective action was complete.

5. Groundwater Monitoring Requirements

- a) If free product is present in a groundwater monitoring well, the Department will not require groundwater sampling from that monitoring well unless:
 - i) that monitoring well is a groundwater point-of-compliance well, AND
 - ii) the groundwater sampling results are being used at that time as part of an Act 2 demonstration of attainment.
- b) Interim removal of free product will be initiated and the quantity of free product in the well monitored.

6. Non-Use Aquifer Designation.

- a) If there is an ordinance in effect which prohibits the use of groundwater as a source of potable water, and if that ordinance does not contain a “grandfather clause”, a door to door survey is not required.
- b) If there is an no ordinance in effect which prohibits the use of groundwater as a source of potable water, or if the ordinance contains a “grandfather clause”, a door to door survey must be completed for 100% of the properties (unless homes are constructed after the ordinance), in accordance with the distances and directions set forth in Pennsylvania Code, Title 25, § 250.303 and 250.705(2).
- c) In pursuing a non-use aquifer designation, it is not necessary to decommission an existing supply well if the owner of the well verifies that the supply well is not used for drinking water and there is an ordinance prohibiting the use of groundwater as a source of potable water.

7. Background Standard

- a) In order to establish a background standard from a known up-gradient release, it will be necessary to obtain a minimum of 8 consecutive quarterly samples from background reference wells and on-site wells, unless otherwise agreed to between the Department and BP (see Pennsylvania Code, Title 25, §250.707(a)(2)(iii).

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- b) If a background standard is chosen as the remedial goal, the upper tolerance limits established by the highest concentrations observed coming onto a site during the most recent 8 quarterly sampling events will apply to the entire affected area of the site. See Pennsylvania Code, Title 25, §250.203(b) and (c).
8. Deed Notices
- a) Deed notices will be necessary, preferably at the time of obtaining the Release of Liability, if a statewide health standard is attained and COCs are present on the property above the residential statewide health standards.
 - b) The Department highly recommends deed notices in cases where an onsite exposure pathway is currently designated as incomplete but is likely to become complete at some point in the future.
9. Deed Restrictions
- a) If a site specific standard is chosen as the remedial goal, a deed restriction or other institutional control may be necessary to implement the remedy
10. Release of Liability Options for Soil and Groundwater
- a) The Department can issue an NFA determination for soils, based on corrective actions completed prior to August 16, 1997 (see Item 4, NFA Determinations), even if corrective actions for groundwater are not complete.
 - b) If requested, the Department will issue a release of liability for soil that meets the applicable Act 2 standards even if corrective actions for groundwater have not been completed.
 - c) Except as described in Item 2 (b), the Department will not issue a release of liability for groundwater if there are known impacts to soil that exceed the chosen Act 2 remedial standard and corrective actions for soil have not been completed.
11. Use of Pre-Existing Data
- a) The DEP will not require BP to re-characterize a site using the updated list of COCs, but any attainment demonstration for a site using the current list of COCs must be completed using appropriate EPA laboratory methodology.