

Table 1
AOC Soil Sample Results
Emerson Power Transmission
Ithaca, New York

Sample ID	NYSDEC Subpart 375-6 Protection of Groundwater	NYSDEC Subpart 375-6 Industrial	AOC 1							
			SB-1a		SB-1b		SB-1c		SB-1d	
			8/21/2007		8/21/2007		8/21/2007		8/21/2007	
Sampling Date			8-10	(b)	12-13.3		8-9		11-12	
Depth (feet)										
VOCs (µg/Kg) (a)										
Acetone	50	1,000,000	30	U	25	U	11	J	710	U
2-Butanone	120	1,000,000	30	UJ	25	U	25	U	710	UJ
Carbon disulfide	NT	NT	2	J	1	J	2	J	150	
<i>cis-1,2-Dichloroethylene</i>	250	1,000,000	6	U	2	J	5	U	130	J
Methyl Acetate	NT	NT	6	U	5	U	5	U	210	
<i>Methylene chloride</i>	50	1,000,000	27		23		11		170	(c)
<i>Tetrachloroethene</i>	1,300	300,000	1	J	2	J	2	J	140	U
<i>Trichloroethene</i>	470	400,000	12		28		6		73	J
Trichlorofluoromethane	NT	NT	6	UJ	5	U	5	U	140	UJ
<i>Vinyl chloride</i>	20	27,000	12	U	10	U	10	U	290	
Metals (mg/kg)										
Aluminum	NT	NT	13,500		11,600		10,400		9,900	
Arsenic	16	16	24		10		7.9		4.8	
Barium	820	10,000	108		109		131		55.1	
Beryllium	47	2,700	0.64		0.47		0.48		0.51	
Calcium	NT	NT	1,390		1,560		3,840		1,170	
Chromium	NT	NT	90.1		26.9		17.9		14.8	
Cobalt	NT	NT	12.9		13.4		13.3		10	
Copper	1,720	10,000	30.4		21.4		20.2		15.6	
Iron	NT	NT	63,800		29,400		32,800		20,900	
Lead	450	3,900	50		28.4		18.1		11.3	
Magnesium	NT	NT	4,540		4,030		3,910		3,040	
Manganese	2,000	10,000	352		525		458		1150	
Mercury	0.73	5.7	0.206		0.021		0.153		0.029	
Nickel	130	10,000	56.3		47.2		30.1		20.7	
Potassium	NT	NT	1,040		690		769		709	
Vanadium	NT	NT	21.2		16.1		15.4		17.6	
Zinc	2,480	10,000	69		58.2		50.3		46.4	

a/ Compounds listed in *italics* are site-related VOCs

b/ U - not detected above laboratory detection limit; J - estimated value; NT - no standard available;
VOC - volatile organic compound; µg/kg - micrograms per kilogram; mg/kg - miligrams per kilogram.

c/ Shading - value exceeds Protection of Groundwater Standard.

Bold value exceeds Industrial Standard

Table 2

AOC Groundwater Sample Results
Emerson Power Transmission
Ithaca, New York

Sample ID:	TOGS 1.1.1, Table 1, Ambient Water Quality Standards and Guidance	AOC 1			
		SB-1a		SB-1d	
		8/21/2007		8/21/2007	
Sampling Date:		8-10	(a)	11-12	
Depth (feet):					
Site-Related VOCs (µg/L)					
cis-1,2-Dichloroethylene	5	1	U	1,800	D
trans-1,2-Dichloroethene	5	1	U	15	
Trichloroethene	5	1	U	31	
Vinyl chloride	2	1	U	190	D
Other VOCs (µg/L)					
Acetone	50	16		7	
Bromodichloromethane	50 *	1	U	1	U
Carbon disulfide	NT	1.3		1.2	
Chloroethane	5	7.1		1	U
Chloroform	7	1	U	1	U
Dibromochloromethane	NT	1	U	1	U
1,1-Dichloroethane	5	1.7		2.1	
1,1-Dichloroethene	5	1	U	3.3	
Methylcyclohexane	NT	1	U	1.6	

a/ U - not detected above laboratory detection limit; * - denotes guidance value;

NT - no standard available; D - result is from secondary dilution; µg/L - micrograms per liter.

Bold values exceed the New York State Division of Water Technical and Operational Guidance

Table 3

**AOC Free Product Sample Results
Emerson Power Transmission
Ithaca, New York**

Sample ID:	AOC 4		AOC 15		AOC 24	
	SB-4b		SB-15		MW-8B-P	
Sample Type:	Product		Product		Product	
Sampling Date:	8/29/2007		8/21/2007		9/13/2007	
Depth (feet):	8-10		20-24			
Units	µg/L		µg/kg		µg/kg	
Site-Related VOCs						
cis-1,2-Dichloroethylene	5	U	NA		2,400	UR
Methylene chloride	NA		NA		1,800	J
Tetrachloroethene	NA		NA		2,400	UR
trans-1,2-Dichloroethene	5	U	NA		2,400	UR
Trichloroethene	5	U	NA		2,600	J
Vinyl chloride	5	U	NA		4,700	UR
Other VOCs						
Acetone	25	U	NA		NA	
Bromodichloromethane	5	U	NA		NA	
Carbon disulfide	5	U	NA		NA	
Chloroethane	5	U	NA		NA	
Chloroform	5	U	NA		NA	
Dibromochloromethane	5	U	NA		NA	
1,1-Dichloroethane	5	U	NA		NA	
1,1-Dichloroethene	5	U	NA		2,400	UR
Methylcyclohexane	5	U	NA		NA	
SVOCs						
Naphthalene	NA		140	U	NA	
Metals						
Lead	NA		22.5		NA	

a/ U - not detected above laboratory detection limits; * - denotes guidance value;
 J - estimated value; R - result unusable due to low surrogate recovery;
 NA - not analyzed; µg/L - micrograms per liter; µg/kg - micrograms per kilogram.
 b/ Free product was collected from SB-4b was analyzed as a liquid;
 free product collected from SB-15 and MW-8B was analyzed as a solid.

Table 4

**Sample Analysis Summary per AOC (a)
Emerson Power Transmission Site
Ithaca, New York**

<u>AOC</u>	<u>Description</u>	Parameters	
		Total VOCs	Characterization Methods
SOIL SAMPLES			
1	Former Department 507 Degreasing <u>A-Zone</u> Borings SB-1e and SB-1f	2	
WATER SAMPLES			
1	Former Department 507 Degreasing <u>B-Zone</u> Borings SB-1e and SB-1f	2	
	Former Boring SB-1d	1	
PRODUCT SAMPLES			
4	Former Open Reservoir (Stone)	3	3
15	Former 500 gallon Gasoline Aboveground Tank	5	5
24	Fire Water Reservoir	2	2

a/ AOC - area of concern VOCs - volatile organic compounds

Table 5

Identification and Qualitative Evaluation Matrix for Potential Groundwater and Soil Remediation Technologies in AOCs 1, 4, 15, and 24
Emerson Power Transmission
Ithaca, New York

Area of Concern	Media	Remediation Technology	Qualitative Evaluation of Technical Benefits, Technical Limitations, and Cost			Relative Cost Range	Recommendation & Rationale
			Technical Benefits	Technical Limitations	Cost Considerations		
AOC 1	Groundwater	No Action	<ul style="list-style-type: none"> None; the constituents of groundwater would not be addressed by any treatment technology Does not achieve RAOs for groundwater 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> The no-action alternative does not require the implementation of any treatment technology 	None	<p>Not Feasible: RAOs for groundwater would not be achieved</p>
		Monitored Natural Attenuation	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Requires very little or no maintenance compared to other mechanically based technologies Can be used as supplement remedy to other technologies 	<ul style="list-style-type: none"> The constituents of soil and groundwater would not be addressed by any treatment technology The effectiveness of natural processes would be determined through monitoring Does not hydraulically contain dissolved VOCs Does not effectively address source areas or "hot spots" 	<ul style="list-style-type: none"> Relatively low capital cost required to implement monitoring program No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness 	Low	<p>Potentially Feasible: Existing data indicate favorable conditions for MNA, and can be readily integrated with other technologies</p>
		Air Sparging with Soil Vapor Extraction	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Can achieve containment as hydraulic barrier if used as sparge curtain configuration 	<ul style="list-style-type: none"> Effectiveness is limited by existing building and structures that prevent direct application to affected groundwater that underlies the buildings and structures Low permeability (10^{-5} cm/s) and heterogeneity of soil materials will limit effectiveness by preventing uniform distribution of air sparge and transfer of stripped VOCs 	<ul style="list-style-type: none"> Can provide relatively short remediation time frame Capital and annual O&M costs can be high if large-scale vapor treatment equipment is required to control VOC emissions Can be expensive to implement if large number of injection points are needed to treat plume 	Moderate	<p>Not Feasible: Low permeability of unconsolidated overburden aquifer and bedrock aquifer, plus presence of existing buildings, will prevent effective application</p>
		In-situ Bioremediation	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Can require very little or no maintenance compared to other mechanically based technologies Can be used to treat saturated/capillary fringe soil and affected groundwater in overburden soil and fractured bedrock Can be readily introduced into fractured bedrock 	<ul style="list-style-type: none"> Does not hydraulically contain dissolved VOCs Effectiveness is limited by existing building and structures that prevent direct application to affected groundwater that underlies the buildings and structures Low permeability (10^{-5} cm/s) and heterogeneity of overburden soil materials will limit effectiveness by preventing uniform distribution of injected fluids May be necessary to use fractured bedrock injection/distribution wells to target upper portion of B-zone directly below overburden Will require permanent injection/distribution points 	<ul style="list-style-type: none"> Can be expensive to implement if large number of permanent injection/distribution points are needed to treat plume as determined by pre-design activities No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness 	Moderate to High	<p>Potentially Feasible: Existing data indicate favorable conditions for bioremediation</p>

Table 5

Identification and Qualitative Evaluation Matrix for Potential Groundwater and Soil Remediation Technologies in AOCs 1, 4, 15, and 24
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Area of Concern	Media	Remediation Technology	Qualitative Evaluation of Technical Benefits, Technical Limitations, and Cost			Relative Cost Range	Recommendation & Rationale
			Technical Benefits	Technical Limitations	Cost Considerations		
		In-situ Oxidation	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Requires very little or no maintenance compared to other mechanically based technologies Can be used to treat saturated/capillary fringe soil and affected groundwater in overburden soil and fractured bedrock Can be readily introduced into fractured bedrock Remedial technology typically significantly reduces remediation time frame 	<ul style="list-style-type: none"> Does not hydraulically contain dissolved VOCs Effectiveness is limited by existing building and structures that prevent direct application to affected groundwater that underlies the buildings and structures Low permeability(10⁻⁵ cm/s) and heterogeneity of soil materials will limit effectiveness by preventing uniform distribution of oxidant solution Will be necessary to use fractured bedrock injections to target upper portion of B-zone directly below overburden Will require permanent injection points Exothermic reaction of certain oxidants with organic materials can create heat and/or steam pressure that may damage subsurface utilities and structures 	<ul style="list-style-type: none"> Can be expensive to implement if large number of permanent injection/distribution points are needed to treat plume as determined by pre-design activities No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness 	Moderate to High	<p>Potentially Feasible: Pre-design activities necessary to determine subsurface properties and effectiveness</p>
		Permeable Reactive Barrier	<ul style="list-style-type: none"> Can provide hydraulic containment of dissolved VOCs and prevent potential impact to offsite properties Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Requires very little or no maintenance compared to other mechanically based technologies 	<ul style="list-style-type: none"> Existing structures and utilities prevent installation of continuous barrier that transects the VOC plume Does not effectively address source areas or "hot spots" Useful only as a containment technology at this site; would need to be integrated with other technologies if sources area is to be addressed 	<ul style="list-style-type: none"> No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness Can be expensive to implement if deep trench installation is required to intercept full vertical profile of dissolved VOC plume into fractured bedrock 	Moderate	<p>Not Feasible: Not implementable at site due to presence of existing structures and underground utilities, bedrock, and is only considered a containment technology</p>
		Pumping and Treatment	<ul style="list-style-type: none"> Can provide hydraulic containment of dissolved VOCs and prevent potential impact to offsite properties Can be integrated with other technologies to establish hydraulic containment and control dissolved VOC migration 	<ul style="list-style-type: none"> Overall remediation time can be relatively long due to dissolution-limited rate of dissolved VOC extraction Can require large number of extraction wells to ensure adequate capture in low-permeability formations; groundwater yield of aquifer is expected to be extremely low 	<ul style="list-style-type: none"> Relatively long remediation time can increase operating costs significantly over life of system Large number of extraction wells and/or treatment of large volumes of water will require relatively expensive treatment equipment due to size and power consumption 	Moderate to High	<p>Not Feasible: Not effectively implementable at site due to low-permeability soils, bedrock, and low groundwater yield</p>
	Soil	No Action	<ul style="list-style-type: none"> None; the constituents of soil would not be addressed by any treatment technology Does not achieve RAOs for soil 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> The no-action alternative does not require the implementation of any treatment technology 	None	<p>Not Feasible: RAOs for soil would not be achieved</p>
		Containment / Institutional Control	<ul style="list-style-type: none"> Engineering controls such as a cap can successfully protect the safety of persons that could come in contact with soil A deed restriction or use restriction in the form of an environmental easement can be enacted as an institutional control to prevent interaction with affected soils A Site Management Plan would be developed and implemented to include institutional and engineering controls 	<ul style="list-style-type: none"> There would be no active treatment of soil Contamination above unrestricted levels would remain in the soil if technology was applied alone 	<ul style="list-style-type: none"> Low cost alternative that may include maintaining a cap over the area 	Low	<p>Potentially Feasible: May be used in conjunction with other technologies or remedial alternatives being implemented for other media (groundwater) at the site</p>

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Area of Concern	Media	Remediation Technology	Qualitative Evaluation of Technical Benefits, Technical Limitations, and Cost			Relative Cost Range	Recommendation & Rationale
			Technical Benefits	Technical Limitations	Cost Considerations		
		Soil Vapor Extraction	<ul style="list-style-type: none"> Can be used in conjunction with air sparging groundwater remedy Effectively removes VOCs in soil to protect groundwater quality 	<ul style="list-style-type: none"> Effectiveness is limited by existing building and structures that prevent direct application to affected soil that underlies the buildings and structures Low permeability (10⁻⁵ cm/s) and heterogeneity of soil materials will limit effectiveness by preventing uniform extraction of VOC laden vapor 	<ul style="list-style-type: none"> Can provide relatively short remediation time frame Capital and annual O&M costs can be high if large-scale vapor treatment equipment is required to control VOC emissions Can be expensive to implement if large number of extraction points are needed to affected soil 	Moderate	<p>Not Feasible: Low permeability of soil, bedrock, plus presence of existing buildings, will prevent effective application</p>
		Excavation	<ul style="list-style-type: none"> Affected soil is mechanically removed and disposed of at an off-site RCRA approve facility Proven process that can affectively achieve RAOs for soil 	<ul style="list-style-type: none"> Not easily implemented to remove soil located inside an active manufacturing building at a depth greater than 10 feet below ground surface Integrity of structure could be affected by excavation activities 	<ul style="list-style-type: none"> Excavation of soil greater than 10 feet below ground surface would increase cost due to evaluation and implementation of structural safety measures Expensive due to limited access inside the building to perform excavation activities 	High	<p>Not Feasible: Not readily implementable due to depth of affected soil and location inside building</p>
AOC 4, 15, & 24	Groundwater (Free Product)	No Action	<ul style="list-style-type: none"> None; the constituents of groundwater would not be addressed by any treatment technology Does not achieve RAOs for groundwater 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> The no-action alternative does not require the implementation of any treatment technology 	None	<p>Not Feasible: RAOs for groundwater would not be achieved</p>
		Monitored Natural Attenuation	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Requires very little or no maintenance compared to other mechanically based technologies Can be used as supplement remedy to other technologies 	<ul style="list-style-type: none"> The free product in groundwater would not be addressed by any treatment technology; does not achieve RAOs The effectiveness of natural processes would be determined through monitoring Does not hydraulically contain free product 	<ul style="list-style-type: none"> Relatively low capital cost required to implement monitoring program No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness 	Low	<p>Not Feasible: Will not meet the RAO of removing free product from groundwater</p>
		In-situ Oxidation	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Requires very little or no maintenance compared to other mechanically based technologies Typically shortens overall remediation time frame 	<ul style="list-style-type: none"> Does not hydraulically contain free product Effectiveness is limited by existing building at AOC 4 and structures that prevent direct application to affected groundwater that underlies the buildings and structures Not effective at treating large thicknesses of free product Oxidant may displace and spread free product during injection Low permeability (10⁻⁵ cm/s) and heterogeneity of soil materials will limit effectiveness by preventing uniform distribution of oxidant solution; would be limited to injecting in a network of wells that have measurable free product Exothermic reaction of certain oxidants with organic materials can create heat and/or steam pressure that may damage subsurface utilities and structures 	<ul style="list-style-type: none"> No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness Can be expensive to implement if large number of injection points needed to treat free product 	Moderate to High	<p>Potentially Feasible: If only introducing oxidant in designated wells with free product determined by pre-design investigation activities</p>

Table 5

Identification and Qualitative Evaluation Matrix for Potential Groundwater and Soil Remediation Technologies in AOCs 1, 4, 15, and 24
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Area of Concern	Media	Remediation Technology	Qualitative Evaluation of Technical Benefits, Technical Limitations, and Cost			Relative Cost Range	Recommendation & Rationale
			Technical Benefits	Technical Limitations	Cost Considerations		
		In-situ Bioremediation	<ul style="list-style-type: none"> Eliminates the need for ex-situ treatment of groundwater, which reduces technical complexity and associated costs Can require very little or no maintenance compared to other mechanically based technologies 	<ul style="list-style-type: none"> Does not hydraulically contain free product in groundwater Effectiveness is limited by existing building at AOC 4 and structures that prevent direct application to affected groundwater that underlies the buildings and structures Not effective at treating large thicknesses of free product Low permeability (10^{-5} cm/s) and heterogeneity of soil materials will limit effectiveness by preventing uniform distribution of injected fluids Long treatment time frame Need to characterize product to determine if it is recalcitrant to biodegradation 	<ul style="list-style-type: none"> Can be expensive to implement if large number of injection points are needed to treat free product No associated annual O&M costs; only periodic groundwater monitoring required to demonstrate effectiveness 	Moderate to High	<p>Not Feasible: Low permeability of unconsolidated aquifer, plus presence of existing buildings in AOC 4, will prevent effective application; long remedial time frame and free product may be recalcitrant to biodegradation</p>
		Free Product Removal and Offsite Treatment / Disposal	<ul style="list-style-type: none"> Removes product for subsequent containerization and offsite treatment/disposal If sufficient free product is available for pumping, product-only pumps are readily available and easy to install Absorbent product socks, manual bailing, or vacuum extraction with a vacuum truck may be implemented to remove free product from wells/sumps Effectively removes product to meet RAO 	<ul style="list-style-type: none"> Experience has shown product-only pumps are not always effective in removing thin layers of free product Would require vertical and horizontal delineation of free product to determine placement of collection wells/sumps for product removal Vacuum extraction or manual removal would require frequent O&M activities to facilitate product removal 	<ul style="list-style-type: none"> Relative low cost alternative based on the number of extraction wells containing free product Low O&M cost associated with removal of free product to demonstrate effectiveness Continued groundwater monitoring after free product is removed to demonstrate that new free product does not enter the wells/sumps 	Low to Moderate	<p>Potentially Feasible: Extent of free product to be determined during pre-design investigation activities</p>

Table 6

Evaluation Matrix for Potentially Feasible Groundwater and Soil Remediation Technologies in AOCs 1, 4, 15, and 24
Emerson Power Transmission
Ithaca, New York

Area of Concern	Media	Potentially Feasible Technology	Site-Specific Technical Feasibility				Recommendation for Selection
			Long-term Effectiveness	Short-Term Effectiveness	Implementability	Estimated Time Frame	
AOC 1	Groundwater	Monitored Natural Attenuation	<ul style="list-style-type: none"> Effective in the long-term if VOCs are effectively degraded to non-toxic chemical compounds Long-term effectiveness dependant on maintaining anaerobic aquifer conditions that are conducive to reductive de-chlorination 	<ul style="list-style-type: none"> Not effective in the short-term due to low biodegradation rates Will not achieve hydraulic containment in short-term or long-term 	<ul style="list-style-type: none"> Presence of TCE degradation compounds indicates aquifer conditions are conducive to natural attenuation, and therefore should be feasible at this site Requires plume stability to be effective; may need to be implemented in conjunction with the downgradient groundwater source removal/control remedy 	7 to 10 years if used in conjunction with control technology	Not Recommended: Will not achieve RAOs for groundwater as a stand alone alternative technology
		In-Situ Bioremediation	<ul style="list-style-type: none"> Long-term effectiveness dependant on maintaining anaerobic aquifer conditions that are conducive to reductive de-chlorination Biostimulation compounds can be effective for many months in the subsurface and can promote anaerobic conditions for a significant period of time 	<ul style="list-style-type: none"> Even with biostimulation, degradation rates are slow 	<ul style="list-style-type: none"> Presence of TCE degradation compounds indicates aquifer conditions are conducive to natural attenuation, and therefore should be feasible at this site Biostimulation compounds promote anaerobic conditions favorable for product degradation Injection/dispersion of biostimulation compounds is more complicated and costly because of bedrock Would require installation of permanent injection / distribution points because of need to inject into bedrock and thin overburden layer above bedrock Long-term monitoring program is easily established 	5 to 10 years	Potentially Recommended: Pending pre-design investigation results
		In-Situ Oxidation	<ul style="list-style-type: none"> Effective in long-term with successful injection With proper oxidant, can effectively oxidize VOCs into less toxic compounds VOC concentrations may rebound, which would require future injections Long-term monitoring would be necessary to ensure continued acceptable levels of VOCs 	<ul style="list-style-type: none"> Various levels of contaminant removal are limited by reaction time and can often be determined in laboratory bench scale/treatability testing 	<ul style="list-style-type: none"> Requires treatability study and optimization testing to determine critical physical and chemical parameters to complete technology selection Requires demand test to determine matrix of aquifer and compatibility with selected technology Injection/dispersion of oxidant is more complicated and costly because of bedrock Would require installation of more-costly permanent injection/ distribution points because of need to inject into bedrock and thin overburden layer above bedrock Long-term monitoring program is easily established Use of certain oxidants can inhibit natural bioremediation 	Up to 2 years	Potentially Recommended: Pending pre-design investigation results

Table 6

Evaluation Matrix for Potentially Feasible Groundwater and Soil Remediation Technologies in AOCs 1, 4, 15, and 24
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	Soil	Containment / Institutional Control	<ul style="list-style-type: none"> Implementing this alternative would mitigate the potential for exposure to these materials by providing a physical barrier Future subsurface excavation activities (i.e., utility installation, new building foundation) would require personal protective equipment in accordance with site-specific health and safety plan Effective when implemented in conjunction with groundwater treatment remedy Maintaining deed restrictions, environmental easements, and implementing site management plan Cap integrity and effectiveness would be required on a regular basis 	<ul style="list-style-type: none"> Short-term effectiveness would be immediate upon installation of the necessary cap and controls 	<ul style="list-style-type: none"> Construction of a cap outside the building is technically feasible and easily implemented; most of the area is already under asphalt but may require replacement with appropriate cap Modification of building floor is easily constructed to maintain a cap inside the building 	30 years	<p>Recommended: Effective at mitigating exposure to affected soil while meeting the site-specific RAO of minimizing exposure to subsurface soil by current and future on-site workers</p>
AOC 4, 15, and 24	Groundwater	In-situ Oxidation	<ul style="list-style-type: none"> Free product could re-enter wells because technology does not hydraulically contain free product Product levels may rebound, which would require future treatment Long-term monitoring would be necessary to ensure continued acceptable levels of VOCs 	<ul style="list-style-type: none"> With proper oxidant, this technology can effectively destroy free product limited only by the reaction speed Will not achieve hydraulic containment in the short-term or long-term Treatment is only limited to measurable free product found in a network of designated injection wells 	<ul style="list-style-type: none"> Requires treatability study and optimization testing to determine critical physical and chemical parameters to complete technology selection Requires demand test to determine matrix of aquifer and compatibility with selected technology Requires characterization of free product Installation of injection points is technically feasible and reasonably easy to implement Injection of oxidant into wells can be easily implemented Would require delineation of free product to ensure only a thin layer was present 	Up to 2 years	<p>Not Recommended (stand alone): Low permeability of unconsolidated aquifer, plus presence of existing buildings in AOC 4, will prevent effective application</p> <p>Potentially Recommended: As a polishing technology with product removal</p>
		Free Product Removal and Offsite Treatment / Disposal	<ul style="list-style-type: none"> This alternative would be effective in the long-term with continued monitoring of free product If free product returned after removal, it would need to be removed again It is unknown if free product will continue to enter wells 	<ul style="list-style-type: none"> Effective immediately upon removal of free product 	<ul style="list-style-type: none"> Removal of and disposal of free product would be easily implemented Equipment for removal is readily available and can be mobilized to the site upon completion of proper subcontracts Long-term monitoring program is easily established 	Up to 2 years	<p>Recommended: Product removal is the most effective way to remove free product without costly, intrusive technologies</p>