APPENDIX C: Tables

ROD RISK WORKSHEET

Table G-1

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure (1)
		Minimum	Maximum					
B&M Locomotive Shop Disposal Area								
	Lead	13.2	2,370	mg/kg	4 / 5	2,370	mg/kg	Max
Contaminated Soils Area								
	Lead	69.1	10,800	mg/kg	46 / 46	1,830	mg/kg	95% UCL

Key

(1) Statistics: Maximum Detected Value (Max); 95% UCL (95% UCL);
Arithmetic Mean (Mean)

The table represents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for the COCs detected in surface soil (i.e., the concentrations that will be used to estimate the exposure and risk for each COC in surface soil). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC, and how the EPC was derived. This table indicates that lead was detected more frequently at the Contaminated Soil Area than at the B&M Locomotive Shop Disposal Area. The 95% UCL on the arithmetic mean was used as the EPC for lead at the Contaminated Soil Area. However, due to the limited amount of sample data available for lead at the B&M Locomotive Shop Disposal Area, the maximum detected concentration was used as the default EPC.

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

Table G-2

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point *Concentration* Units	Statistical Measure
		Minimum	Maximum					(1)
Old B&M Oil/Sludge Recycling Area								
	Lead	8.9	4,120	mg/kg	24 / 27	4,120	mg/kg	Max

Key

(1) Statistics: Maximum Detected Value (Max); 95% UCL (95% UCL);
Arithmetic Mean (Mean)

The table represents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in surface soil/subsurface soil (i.e., the concentrations that will be used to estimate the exposure and risk for each COC in surface soil/subsurface soil). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC, and how the EPC was derived. Due to the variability of the data available for lead at the Old B&M Oil/Sludge Recycling Area, the maximum detected concentration was used as the default EPC.

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

Table G-3

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Minimum	Detected Maximum	Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure (1)
B&M Railroad Landfill - Shallow Overburden								
	Aldrin	0.010	0.010	ug/l	1 / 10	0.010	ug/l	Max
	PCBs	0.060	0.15	ug/l	3 / 10	0.15	ug/l	Max
	Arsenic	3.1	55.6	ug/l	3 / 10	55.6	ug/l	Max
	Manganese	12.5	5,420	ug/l	7 / 10	5,420	ug/l	Max
B&M Railroad Landfill - Bedrock								
	1,2-Dichloroethane	6.0	9.0	ug/l	4 / 10	9.0	ug/l	Max
	1,1-Dichloroethane	3.0	9.0	ug/l	4 / 10	9.0	ug/l	Max
	Trichloroethene	22	50	ug/l	4 / 10	50	ug/l	Max
	Arsenic	3.8	19.6	ug/l	4 / 10	19.6	ug/l	Max
RSI Landfill - Shallow Overburden								
	Benzene	345	350	ug/l	2 / 14	350	ug/l	Max
	Arsenic	5.5	186	ug/l	12 / 14	186	ug/l	Max
	Manganese	11.7	2,440	ug/l	14 / 14	2,440	ug/l	Max
RSI Landfill - Deep Overburden								
	1,1,2,2-Tetrachloroethane	5.0	5.0	ug/l	1 / 10	5.0	ug/l	Max
	Trichloroethene	21	23	ug/l	2 / 10	23	ug/l	Max
	PCBs	0.0060	0.080	ug/l	4 / 10	0.080	ug/l	Max
	Arsenic	3.1	345	ug/l	7 / 10	345	ug/l	Max
	Manganese	1,100	6,400	ug/l	10 / 10	6,400	ug/l	Max
	Thallium	8.9	9.0	ug/l	2 / 10	9.0	ug/l	Max
RSI Landfill - Bedrock								
	1,2-Dichloroethane	2.0	6.0	ug/l	5 / 10	6.0	ug/l	Max
	1,1-Dichloroethene	2.0	2.0	ug/l	1 / 10	2.0	ug/l	Max
	Tetrachloroethene	3.0	3.0	ug/l	2 / 10	3.0	ug/l	Max
	PCBs	0.080	0.080	ug/l	1 / 10	0.080	ug/l	Max
	Arsenic	2.125	11.9	ug/l	4 / 10	11.9	ug/l	Max
	Manganese	10.35	2,690	ug/l	8 / 10	2,690	ug/l	Max

Table G-3

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					(1)
B&M Locomotive Shop Disposal Area - Shallow Overburden								
	Manganese	10.5	11,000	ug/l	7 / 8	11,000	ug/l	Max
B&M Locomotive Shop Disposal Area - Deep Overburden								
	Arsenic	11.8	16.6	ug/l	2 / 8	16.6	ug/l	Max
Old B&M Oil/Sludge Recycling Area - Shallow Overburden								
	Arsenic	9.9	27.1	ug/l	4 / 12	27.1	ug/l	Max
	Manganese	56.4	1,480	ug/l	12 / 12	1,480	ug/l	Max
Old B&M Oil/Sludge Recycling Area - Deep Overburden								
	Manganese	10.2	1,370	ug/l	12 / 12	1,370	ug/l	Max
Old B&M Oil/Sludge Recycling Area - Bedrock								
	Arsenic	3.0	9.6	ug/l	4 / 10	9.6	ug/l	Max
	Manganese	10.2	1,370	ug/l	10 / 10	1,370	ug/l	Max
Asbestos Lagoons - Shallow Overburden								
	1,1,2,2-Tetrachloroethane	3.0	3.0	ug/l	1 / 10	3.0	ug/l	Max
	Arsenic	12.1	58.1	ug/l	6 / 10	58.1	ug/l	Max
Asbestos Lagoons - Deep Overburden								
	1,2-Dichloroethane	3.0	3.0	ug/l	2 / 8	3.0	ug/l	Max
	Bis(2-ethylhexyl)phthalate	3.0	13	ug/l	2 / 8	13	ug/l	Max
	Arsenic	12	17.3	ug/l	2 / 8	17.3	ug/l	Max
	Beryllium	2.4	2.4	ug/l	1 / 8	2.4	ug/l	Max
	Manganese	853	4,160	ug/l	8 / 8	4,160	ug/l	Max
Asbestos Lagoons - Bedrock								
	1,2-Dichloroethane	3.0	39	ug/l	6 / 6	39	ug/l	Max
	Bis(2-ethylhexyl)phthalate	17	17	ug/l	1 / 6	17	ug/l	Max
	PCBs	0.10	0.10	ug/l	1 / 6	0.10	ug/l	Max
	Beryllium	2.1	2.1	ug/l	1 / 6	2.1	ug/l	Max
	Manganese	453	8,745	ug/l	6 / 6	8,745	ug/l	Max

Table G-3

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					(1)

Key

(1) Statistics: Maximum Detected Value (Max); 95% UCL (95% UCL);
Arithmetic Mean (Mean)

The table represents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in groundwater (i.e., the concentrations that will be used to estimate the exposure and risk for each COC in groundwater). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC, and how the EPC was derived. This table indicates that inorganic chemicals are the most frequently detected COCs in groundwater at the site. As presecribed by EPA guidance, the maximum detected concentration was used as the EPC for all COCs detected in groundwater within each flow zone for each Area of Concern (AOC).

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

Table G-4

Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal

Chemical of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YYYY)
Benzene	2.9E-02	N/A	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/01/96
1,2-Dichloroethane	9.1E-02	N/A	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/01/96
1,1-Dichloroethene	6.0E-01	N/A	$(mg/kg\text{-}day)^{-1}$	C	IRIS	01/01/96
1,1,2,2-Tetrachloroethane	2.0E-01	N/A	$(mg/kg\text{-}day)^{-1}$	C	IRIS	01/01/96
Tetrachloroethene	5.2E-02	N/A	$(mg/kg\text{-}day)^{-1}$	B2/C	IRIS	01/01/96
Trichloroethene*	1.1E-02	N/A	$(mg/kg\text{-}day)^{-1}$	B2/C	IRIS	01/01/96
bis(2-Ethylhexyl)phthalate	1.4E-02	N/A	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/01/96
Aldrin	1.7E+01	N/A	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/01/96
PCBs (carcinogenic)	7.7E+00	N/A	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/01/96
PCBs (noncarcinogenic)						
Aroclor 1016	N/A	N/A	$(mg/kg\text{-}day)^{-1}$	N/A	N/A	N/A
Aroclor 1254	N/A	N/A	$(mg/kg\text{-}day)^{-1}$	N/A	N/A	N/A
Arsenic	1.5E+00	N/A	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/01/96
Beryllium	4.3E+00	N/A	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/01/96
Lead	N/A	N/A	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/01/96
Manganese	N/A	N/A	$(mg/kg\text{-}day)^{-1}$	D	IRIS	01/01/96
Thallium	N/A	N/A	$(mg/kg\text{-}day)^{-1}$	D	IRIS	01/01/96

Key

N/A: Not applicable

IRIS: Integrated Risk Information System, U.S. EPA

NCEA: National Center for Environmental Assessment, U.S. EPA

HEAST: Health Effects Assessment Summary Tables, U.S. EPA

USEPA 1994: U.S. EPA Region 1 Risk Update

EPA Group

A - Human carcinogen

B1 - Probable human carcinogen - Indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

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Table G-4

Cancer Toxicity Data Summary

Pathway: Ingestion, *Dermal*

Chemical of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (MM/DD/YYYY)

***There is a new draft slope factor for TCE which will increase risk by approximately 60-fold, but the cleanup level will still be the MCL.**

This table provides the carcinogenic risk information which is relevant to the contaminants of concern in soil and groundwater. Because the dermal route was not assessed for groundwater exposures and lead was evaluated through use of a lead model, dermal slope factors are not applicable to this assessment.

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

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Table G-5

Non-Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Dermal RfD	Dermal RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates of Rfd: Target Organ (MM/DD/YYYY)
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,2-Dichloroethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,1-Dichloroethene	Chronic	9.0E-03	mg/kg-day	N/A	mg/kg-day	liver	1000	IRIS	01/01/96
1,1,2,2-Tetrachloroethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	N/A	mg/kg-day	liver	1000	IRIS	01/01/96
Trichloroethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
bis(2-Ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg-day	N/A	mg/kg-day	liver	1000	IRIS	01/01/96
Aldrin	Chronic	3.0E-05	mg/kg-day	N/A	mg/kg-day	liver	1000	HEAST	01/01/98
PCBs (carcinogenic)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCBs (noncarcinogenic)									
Aroclor 1016	Chronic	7.0E-05	mg/kg-day	N/A	mg/kg-day	low birth weight	100	IRIS	01/01/96
Aroclor 1254	Chronic	2.0E-05	mg/kg-day	N/A	mg/kg-day	immune system	300	IRIS	01/01/96
Arsenic	Chronic	3.0E-04	mg/kg-day	N/A	mg/kg-day	skin	[3]	IRIS	01/01/96
Beryllium	Chronic	5.0E-03	mg/kg-day	N/A	mg/kg-day	none observed	[100]	IRIS	01/01/96
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	Chronic	2.4E-02	mg/kg-day	N/A	mg/kg-day	CNS	[3]	IRIS	01/01/96
Thallium	Chronic	8.0E-05	mg/kg-day	N/A	mg/kg-day	liver	[3000]	IRIS	01/01/96

Key

N/A - No information available

IRIS - Integrated Risk Information System, U.S. EPA

NCEA - National Center for Environmental Assessment, U.S. EPA

HEAST - Health Effects Assessment Summary Tables, U.S. EPA

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in soil and groundwater. Nine of the COCs have toxicity data indicating their potential for adverse non-carcinogenic health effects in humans. Chronic toxicity data available for the nine COCs for oral exposures have been used to develop chronic oral reference doses (RfDs), provided in this table. The available chronic toxicity data indicate that 1,1-dichloroethene, tetrachloroethene, bis(2-ethylhexyl)phthalate, aldrin, and thallium affect the liver, Aroclor-1254 (a PCB) affects the immune system, arsenic affects the skin, manganese affects the nervous system, and Aroclor 1016 (a PCB) causes low birth weight. Reference doses were not available for the benzene, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, trichloroethene, and lead. Dermal RfDs are not applicable for this assessment because the dermal route was not evaluated for groundwater exposures and lead was evaluated through the use of a lead model.

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

ROD RISK WORKSHEET

Table G-6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Groundwater	Groundwater	B&M Railroad Landfill - Shallow Overburden						
			Aldrin	2E-06	--	--	--	2E-06
			PCBs	4E-06	--	--	--	4E-06
			Arsenic	1E-03	--	--	--	1E-03
							Exposure Point Groundwater Risk Total =	1E-03
Groundwater	Groundwater	B&M Railroad Landfill - Bedrock						
			1,2-Dichloroethane	1E-05	--	--	--	1E-05
			1,1-Dichloroethene	6E-05	--	--	--	6E-05
			Trichloroethene	6E-06	--	--	--	6E-06
			Arsenic	3E-04	--	--	--	3E-04
							Exposure Point Groundwater Risk Total =	4E-04
Groundwater	Groundwater	RSI Landfill - Shallow Overburden						
			Benzene	1E-04	--	--	--	1E-04
			Arsenic	3E-03	--	--	--	3E-03
							Exposure Point Groundwater Risk Total =	3E-03
Groundwater	Groundwater	RSI Landfill - Deep Overburden						
			1,1,2,2-Tetrachloroethane	1E-05	--	--	--	1E-05
			Trichloroethene	3E-06	--	--	--	3E-06
			PCBs	2E-06	--	--	--	2E-06
			Arsenic	6E-03	--	--	--	6E-03
							Exposure Point Groundwater Risk Total =	6E-03

ROD RISK WORKSHEET

Table G-6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Groundwater	Groundwater	RSI Landfill - Bedrock						
			1,2-Dichloroethane	6E-06	--	--	--	6E-06
			1,1-Dichloroethene	1E-05	--	--	--	1E-05
			Tetrachloroethene	2E-06	--	--	--	2E-06
			PCBs	2E-06	--	--	--	2E-06
			Arsenic	2E-04	--	--	--	2E-04
							Exposure Point Groundwater Risk Total =	2E-04
Groundwater	Groundwater	B&M Locomotive Shop Disposal Area - Deep Overburden						
			Arsenic	3E-04	--	--	--	3E-04
							Exposure Point Groundwater Risk Total =	3E-04
Groundwater	Groundwater	Old B&M Oil/Sludge Recycling Area - Shallow Overburden						
			Arsenic	5E-04	--	--	--	5E-04
							Exposure Point Groundwater Risk Total =	5E-04
Groundwater	Groundwater	Old B&M Oil/Sludge Recycling Area - Bedrock						
			Arsenic	2E-04	--	--	--	2E-04
							Exposure Point Groundwater Risk Total =	2E-04
Groundwater	Groundwater	Asbestos Lagoons - Shallow Overburden						
			1,1,2,2-Tetrachloroethane	7E-06	--	--	--	7E-06
			Arsenic	1E-03	--	--	--	1E-03
							Exposure Point Groundwater Risk Total =	1E-03

ROD RISK WORKSHEET

Table G-6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total
Groundwater	Groundwater	Asbestos Lagoons - Deep Overburden						
			1,2-Dichloroethane	3E-06	--	--	--	3E-06
			Bis(2-ethylhexyl)phthalate	2E-06	--	--	--	2E-06
			Arsenic	3E-04	--	--	--	3E-04
			Beryllium	1E-04	--	--	--	1E-04
							Exposure Point Groundwater Risk Total =	4E-04
Groundwater	Groundwater	Asbestos Lagoons - Bedrock						
			1,2-Dichloroethane	4E-05	--	--	--	4E-05
			Bis(2-ethylhexyl)phthalate	3E-06	--	--	--	3E-06
			PCBs	2E-06	--	--	--	2E-06
			Beryllium	1E-04	--	--	--	1E-04
							Exposure Point Groundwater Risk Total =	2E-04
							Total Risk =	

Table G-6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total

Key
-- Route of exposure is not applicable to this medium.

This table provides risk estimates by flow zone and Area of Concern for the drinking water ingestion route of exposure. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of an adult's exposure to groundwater, as well as the toxicity of the COCs (benzene, 1,2-dichloroethane, 1,1-dichloroethene, 1,1,2,2-tetrachloroethane, tetrachloroethene, trichloroethene, bis(2-ethylhexyl)phthalate, aldrin, PCBs, arsenic, beryllium, manganese, and thallium). The total risk from direct exposure to contaminated groundwater at this site to a future adult resident is estimated to be between 2×10^{-4} and $^{6} \times 10^{-3}$. The COC contributing the most to these risk levels is arsenic in groundwater. This risk level indicates that if no clean-up action is taken, an individual would have an increased probability of between 2 in 10,000 and 6 in 1,000 of developing cancer as a result of site-related exposure to the COCs.

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

ROD RISK WORKSHEET

Table G-7

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	B&M Railroad Landfill - Shallow Overburden	Arsenic	Skin	5E+00	--	--	5E+00
			Manganese	Nervous System	6E+00	--	--	6E+00
							Groundwater Hazard Index Total =	1E+01
							Receptor Hazard Index =	1E+01
							Nervous System Hazard Index =	6E+00
							Skin Hazard Index =	5E+00
Groundwater	Groundwater	B&M Railroad Landfill - Bedrock	Arsenic	Skin	2E+00	--	--	2E+00
							Groundwater Hazard Index Total =	2E+00
							Receptor Hazard Index =	2E+00
							Skin Hazard Index =	2E+00
Groundwater	Groundwater	RSI Landfill - Shallow Overburden	Arsenic	Skin	2E+01	--	--	2E+01
			Manganese	Nervous System	3E+00	--	--	3E+00
							Groundwater Hazard Index Total =	2E+01
							Receptor Hazard Index =	2E+01
							Nervous System Hazard Index =	3E+00
							Skin Hazard Index =	2E+01

Table G-7

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	RSI Landfill - Deep Overburden						
			Arsenic	Skin	3E+01	--	--	3E+01
			Manganese	Nervous System	7E+00	--	--	7E+00
			Thallium	Liver	3E+00	--	--	3E+00
							Groundwater Hazard Index Total =	4E+01
							Receptor Hazard Index =	4E+01
							Liver Hazard Index =	3E+00
							Nervous System Hazard Index =	7E+00
							Skin Hazard Index =	3E+01
Groundwater	Groundwater	RSI Landfill - Bedrock	Manganese	Nervous System	3E+00	--	--	3E+00
							Groundwater Hazard Index Total =	3E+00
							Receptor Hazard Index =	3E+00
							Nervous System Hazard Index =	3E+00
Groundwater	Groundwater	B&M Locomotive Shop Disposal Area - Shallow Overburden						
			Manganese	Nervous System	1E+01	--	--	1E+01
							Groundwater Hazard Index Total =	1E+01
							Receptor Hazard Index =	1E+01
							Nervous System Hazard Index =	1E+01
Groundwater	Groundwater	B&M Locomotive Shop Disposal Area - Deep Overburden						
			Arsenic	Skin	2E+00	--	--	2E+00
							Groundwater Hazard Index Total =	2E+00
							Receptor Hazard Index =	2E+00
							Skin Hazard Index =	2E+00

Table G-7

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Old B&M Oil/Sludge Recycling Area - Shallow Overburden	Arsenic	Skin	2E+00	--	--	2E+00
			Manganese	Nervous System	2E+00	--	--	2E+00
							Groundwater Hazard Index Total =	4E+00
							Receptor Hazard Index =	4E+00
							Nervous System Hazard Index =	2E+00
							Skin Hazard Index =	2E+00
Groundwater	Groundwater	Old B&M Oil/Sludge Recycling Area - Deep Overburden	Manganese	Nervous System	2E+00	--	--	2E+00
							Groundwater Hazard Index Total =	2E+00
							Receptor Hazard Index =	2E+00
							Nervous System Hazard Index =	2E+00
Groundwater	Groundwater	Old B&M Oil/Sludge Recycling Area - Bedrock	Manganese	Nervous System	2E+00	--	--	2E+00
							Groundwater Hazard Index Total =	2E+00
							Receptor Hazard Index =	2E+00
							Nervous System Hazard Index =	2E+00
Groundwater	Groundwater	Asbestos Lagoons - Shallow Overburden	Arsenic	Skin	5E+00	--	--	5E+00
							Groundwater Hazard Index Total =	5E+00
							Receptor Hazard Index =	5E+00
							Skin Hazard Index =	5E+00

Table G-7

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Asbestos Lagoons - Deep Overburden	Arsenic	Skin	2E+00	--	--	2E+00
			Manganese	Nervous System	5E+00	--	--	5E+00
							Groundwater Hazard Index Total =	6E+00
							Receptor Hazard Index =	6E+00
							Nervous System Hazard Index =	5E+00
							Skin Hazard Index =	2E+00
Groundwater	Groundwater	Asbestos Lagoons - Bedrock	Manganese	Nervous System	1E+01	--	--	1E+01
							Groundwater Hazard Index Total =	1E+01
							Receptor Hazard Index =	1E+01
							Nervous System Hazard Index =	1E+01

Key

N/A - Toxicity criteria are not available to quantitatively address this route of exposure.

-- Route of exposure is not applicable to this medium.

This table provides, by flow zone for each Area of Concern, hazard quotients (HQs) for each COC in groundwater and the hazard index (sum of the hazard quotients) for the drinking water ingestion route of exposure. The Risk Assessment Guidance (RAGS) for Superfund states that, generally, a hazard index (HI) of greater than 1 indictes the potential for adverse noncancer effects. The estimated range of HIs of between 2 and 40 indicates that the potential for adverse noncancer effects could occur from exposure to contaminated groundwater containing arsenic, manganese, and thallium.

Source: A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents (U.S. EPA, 1999)

TABLE G-8
SOIL COPC SCREENING
B&M RAILROAD LANDFILL
Iron Horse Park Superfund Site, OU3
North Billerica, MA

Analyte	Frequency of Detection	Maximum Soil Conc.	Maximum Background Soil Conc.	Ecological Soil Screening Level	Source of Ecological Screening Level	COC?	Reason	Hazard Quotient (a)
VOCs (ug/kg)								
Acetone	5 / 14	42	N/A	10,000	(1)	N	BSV	0.0042
2-Butanone	1 / 14	7.0	N/A	10,000	(1)	N	FD	0.00070
Methylene Chloride	8 / 14	280	36	N/A		Y		N/A
SVOCs (ug/kg)								
Acenaphthene	5 / 14	340	N/A	N/A		Y		N/A
Acenaphthylene	11 / 14	3,200	N/A	N/A		Y		N/A
Anthracene	12 / 14	5,800	N/A	10,000	(11)	N	BSV	0.58
Benzo(a)anthracene	14 / 14	16,000	N/A	1,000	(4)	Y		16
Benzo(a)pyrene	14 / 14	18,000	N/A	5	(5)	Y		3600
Benzo(b)fluoranthene	14 / 14	33,000	N/A	19,000	(6)	Y		1.7
Benzo(g,h,i)perylene	12 / 14	10,000	N/A	1,000	(1)	Y		10
Bis(2-chloroethyl) ether	1 / 14	280	N/A	N/A		Y		N/A
Bis(2-ethylhexyl)phthalate	7 / 14	25,000	N/A	70,000	(5)	N	BSV	0.36
Butylbenzylphthalate	5 / 14	10,000	N/A	N/A		Y		N/A
Carbazole	8 / 14	3,400	N/A	N/A		Y		N/A
Chrysene	14 / 14	20,000	N/A	5,000	(4)	Y		4.0
Di-n-butylphthalate	1 / 14	390	N/A	60	(1)	Y		6.5
Dibenzo(a,h)anthracene	7 / 14	4,200	N/A	1,000	(4)	Y		4.2
Dibenzofuran	5 / 14	290	N/A	N/A		Y		N/A
Fluoranthene	14 / 14	28,000	N/A	10,000	(11)	Y		2.8
Fluorene	5 / 14	340	N/A	30,000	(12)	N	BSV	0.011
Indeno(1,2,3-cd)pyrene	13 / 14	10,000	N/A	1,000	(1)	Y		10
Isophorone	1 / 14	430	N/A	N/A		N	DF	N/A
2-Methylnaphthalene	7 / 14	260	N/A	N/A		Y		N/A
4-Methylphenol	2 / 14	96	N/A	N/A		N	DF	N/A
Naphthalene	6 / 14	280	N/A	5,000	(11)	N	BSV	0.056
Phenanthrene	14 / 14	17,000	N/A	5,000	(11)	Y		3.4
Phenol	3 / 14	200	N/A	30,000	(12)	N	BSV	0.0067
Pyrene	14 / 14	24,000	N/A	10,000	(11)	Y		2.4
PCBs/Pesticides (ug/kg)								
Aldrin	7 / 14	3.9	N/A	N/A		Y		N/A
alpha-BHC	5 / 13	2.5	N/A	100	(2, 3)	N	BSV	0.025
beta-BHC	1 / 14	1.1	N/A	100	(2, 3)	N	BSV	0.011
delta-BHC	2 / 13	1.4	N/A	100	(2, 3)	N	DF	0.014
gamma-BHC(Lindane)	8 / 14	1.8	N/A	100	(2)	N	BSV	0.018
alpha-Chlordane	6 / 13	13	0.27	500	(1)	N	BSV	0.026
gamma-Chlordane	5 / 13	7.5	N/A	500	(1)	N	BSV	0.015
4,4'-DDD	14 / 14	97	2.6	100	(2, 7)	N	BSV	0.97
4,4'-DDE	10 / 14	50	4.9	100	(2, 7)	N	BSV	0.50
4,4'-DDT	13 / 14	230	7.7	100	(2)	Y		2.3
Dieldrin	1 / 13	5.2	2.1	10	(8)	N	BSV	0.52
Endosulfan I	2 / 13	1.9	N/A	100	(9)	N	BSV	0.019
Endosulfan II	5 / 13	23	1.0	100	(9)	N	BSV	0.23
Endosulfan Sulfate	7 / 13	79	N/A	100	(9)	N	BSV	0.79
Endrin	11 / 13	140	N/A	N/A		Y		N/A
Endrin Aldehyde	7 / 13	110	N/A	N/A		Y		N/A
Endrin Ketone	9 / 13	170	N/A	N/A		Y		N/A
Heptachlor	3 / 13	0.59	N/A	50	(2)	N	BSV	0.012
Heptachlor Epoxide	14 / 14	9.7	2.0	50	(2, 10)	N	BSV	0.19
Methoxychlor	10 / 13	170	1.8	N/A		Y		N/A
Metals (mg/kg)								
Aluminum	14 / 14	7,260	9,630	N/A		N	BKGD	N/A
Antimony	1 / 14	155	N/A	4.5	(2)	Y		34
Arsenic	14 / 14	36	7.6	60	(12)	N	BSV	0.60
Barium	14 / 14	922	32	400	(13)	Y		2.3
Cadmium	8 / 14	35	N/A	20	(2)	Y		1.7
Calcium	14 / 14	14,700	949	N/A		N	EAN	N/A
Chromium	13 / 14	304	N/A	0.4	(12)	Y		760
Cobalt	13 / 14	26	N/A	50	(11)	N	BSV	0.52
Copper	14 / 14	1,030	8.9	50	(12)	Y		21
Cyanide	10 / 14	39	N/A	N/A		Y		N/A
Iron	14 / 14	76,800.	8,350	N/A		Y		N/A
Lead	14 / 14	1,130	102	500	(12)	Y		2.3

TABLE G-8
SOIL COPC SCREENING
B&M RAILROAD LANDFILL
Iron Horse Park Superfund Site, OU3
North Billerica, MA

Analyte	Frequency of Detection	Maximum Soil Conc.	Maximum Background Soil Conc.	Ecological Soil Screening Level	Source of Ecological Screening Level	COC?	Reason	Hazard Quotient (a)
Magnesium	14 / 14	4,300	1480	N/A		N	EAN	N/A
Manganese	14 / 14	1,080	206	1,500	(2)	N	BSV	0.72
Mercury	12 / 14	3.4	N/A	0.1	(12)	Y		34
Nickel	9 / 14	154	N/A	200	(12)	N	BSV	0.77
Potassium	8 / 14	792	N/A	N/A		N	EAN	N/A
Selenium	4 / 14	3.1	N/A	70	(12)	N	BSV	0.044
Silver	1 / 9	1.2	N/A	10	(4)	N	DF	0.12
Vanadium	14 / 14	35	14	150	(2)	N	BSV	0.23
Zinc	14 / 14	4,400	47	200	(12)	Y		22

a. In this screening table, the hazard quotient is calculated by dividing the maximum detection by the screening value.
N/A - Not Applicable or Not Available
COC - Contminant of Concern
BSV - Below screening value
DF - Dection frequency less than 5% site-wide
EAN- Essential animal nutrient
BKGD - Background comparison

Sources:
1. Fitchko (1989).
2. Maximum allowable soil concentration in the former Soviet Union (as cited in Beyer 1990).
3. Value for gamma-BHC(Lindane) conservatively used.
4. Indicative of moderate soil contamination as designated by the soil cleanup criteria of Quebec (as cited in Beyer 1990).
5. Acceptable concentration proposed by Ontario Ministry of Environment (as cited in Beyer 1990).
6. Kappleman (1993).
7. For Screening purposes, maximum allowable DDT concentration was used for DDE and DDT.
8. Decreased cocoon production by Eisenia fetida (Reinecke and Venter 1985 as cited in Beyer 1990).
9. Tenative allowable concentration for endosulfan in the former Soviet Union (as cited in Beyer 1990).
10. Value for heptachlor.
11. Soil criteria for evaluating the severity of contamination under the Dutch Soil Cleanup (Interim) Act (as cited in Beyer 1990).
12. Will and Suter (1994).
13. Guidelines for the New Jersey Environmental Cleanup Responsibility Act (as cited in Beyer 1990).

TABLE G-9
SOIL COPC SCREENING
RSI LANDFILL
Iron Horse Park Superfund Site, OU3
North Billerica, MA

Analyte	Frequency of Detection	Maximum Soil Conc.	Maximum Background Soil Conc.	Ecological Soil Screening Level	Source of Ecological Screening Level	COC?	Reason	Hazard Quotient (a)
VOCs (ug/kg)								
Methylene Chloride	2 / 6	64	36	N/A		Y		N/A
SVOCs (ug/kg)								
Benzo(a)anthracene	1 / 6	120	N/A	1,000	(4)	N	BSV	0.12
Benzo(b)fluoranthene	3 / 6	380	N/A	19,000	(6)	N	BSV	0.020
Chrysene	2 / 6	340	N/A	5,000	(4)	N	BSV	0.068
Fluoranthene	3 / 6	390	N/A	10,000	(11)	N	BSV	0.039
Phenol	2 / 6	220	N/A	30,000	(12)	N	BSV	0.0073
Pyrene	3 / 6	330	N/A	10,000	(11)	N	BSV	0.033
PCBs/Pesticides (ug/kg)								
gamma-Chlordane	1 / 6	0.33	N/A	500	(1)	N	BSV	0.00066
4,4'-DDD	5 / 6	1.6	2.6	100	(2, 7)	N	BSV	0.016
4,4'-DDE	5 / 6	1.4	4.9	100	(2, 7)	N	BSV	0.014
4,4'-DDT	6 / 6	5.2	7.7	100	(2)	N	BSV	0.052
Endosulfan II	1 / 6	0.51	1.0	100	(9)	N	BSV	0.0051
Endrin	4 / 6	1.4	N/A	N/A		Y		N/A
Endrin Ketone	3 / 6	0.87	N/A	N/A		Y		N/A
Heptachlor Epoxide	2 / 6	0.75	2.0	50	(2, 10)	N	BSV	0.015
Methoxychlor	3 / 6	4.0	1.8	N/A		Y		N/A
Metals (mg/kg)								
Aluminum	6 / 6	9,470	9630	N/A		N	BKGD	N/A
Arsenic	6 / 6	4.8	7.6	60	(12)	N	BSV	0.080
Barium	6 / 6	46	32	400	(13)	N	BSV	0.12
Calcium	6 / 6	1,180	949	N/A		N	EAN	N/A
Chromium	4 / 6	24	N/A	0.4	(12)	Y		59
Cobalt	6 / 6	6.5	N/A	50	(11)	N	BSV	0.13
Copper	5 / 6	20	8.9	50	(12)	N	BSV	0.39
Iron	6 / 6	13,600	8,350	N/A		Y		N/A
Lead	6 / 6	248	102	500	(12)	N	BSV	0.50
Magnesium	6 / 6	3,780	1,480	N/A		N	EAN	N/A
Manganese	6 / 6	212	206	1,500	(2)	N	BSV	0.14
Potassium	5 / 6	1,990	N/A	N/A		N	EAN	N/A
Vanadium	6 / 6	20	14	150	(2)	N	BSV	0.13
Zinc	6 / 6	59	47	200	(12)	N	BSV	0.30

a. *In this screening table, the hazard quotient is calculated by dividing the maximum detection by the screening value.*
N/A - Not Applicable or Not Available
COC - Contminant of Concern
BSV - Below screening value
DF - Dection frequency less than 5% site-wide
EAN- Essential animal nutrient
BKGD - Background comparison

Sources:
1. Fitchko (1989).
2. Maximum allowable soil concentration in the former Soviet Union (as cited in Beyer 1990).
3. Value for gamma-BHC(Lindane) conservatively used.
4. Indicative of moderate soil contamination as designated by the soil cleanup criteria of Quebec (as cited in Beyer 1990).
5. Acceptable concentration proposed by Ontario Ministry of Environment (as cited in Beyer 1990).
6. Kappleman (1993).
7. For Screening purposes, maximum allowable DDT concentration was used for DDE and DDT.
8. Decreased cocoon production by Eisenia fetida (Reinecke and Venter 1985 as cited in Beyer 1990).
9. Tenative allowable concentration for endosulfan in the former Soviet Union (as cited in Beyer 1990).
10. Value for heptachlor.
11. Soil criteria for evaluating the severity of contamination under the Dutch Soil Cleanup (Interim) Act (as cited in Beyer 1990).
12. Will and Suter (1994).
13. Guidelines for the New Jersey Environmental Cleanup Responsibility Act (as cited in Beyer 1990).

TABLE G-10
SOIL COPC SCREENING
B&M LOCOMOTIVE SHOP DISPOSAL AREA
Iron Horse Park Superfund Site, OU3
North Billerica, MA

Analyte	Frequency of Detection	Maximum Soil Conc.	Maximum Background Soil Conc.	Ecological Soil Screening Level	Source of Ecological Screening Level	COC?	Reason	Hazard Quotient (a)
VOCs (ug/kg)								
Methylene Chloride	2 / 5	21	36	N/A		Y		N/A
SVOCs (ug/kg)								
Acenaphthene	1 / 5	790	N/A	N/A		Y		N/A
Acenaphthylene	1 / 5	20	N/A	N/A		Y		N/A
Anthracene	2 / 5	1,500	N/A	10,000	(11)	N	BSV	0.15
Benzo(a)anthracene	4 / 5	2,300	N/A	1,000	(4)	Y		2.3
Benzo(a)pyrene	4 / 5	1,700	N/A	5	(5)	Y		340
Benzo(b)fluoranthene	4 / 5	2,900	N/A	19,000	(6)	N	BSV	0.15
Benzo(g,h,i)perylene	3 / 5	960	N/A	1,000	(1)	N	BSV	0.96
Benzo(k)fluoranthene	1 / 5	110	N/A	19,000	(6)	N	BSV	0.0058
Bis(2-ethylhexyl)phthalate	1 / 5	120	N/A	70,000	(5)	N	BSV	0.0017
Carbazole	1 / 5	880	N/A	N/A		Y		N/A
Chrysene	4 / 5	2,400	N/A	5,000	(4)	N	BSV	0.48
Dibenzo(a,h)anthracene	1 / 5	400	N/A	1,000	(4)	N	BSV	0.40
Dibenzofuran	1 / 5	740	N/A	N/A		N	BSV	N/A
Fluoranthene	5 / 5	4,200	N/A	10,000	(11)	N	BSV	0.42
Fluorene	1 / 5	760	N/A	30,000	(12)	N	BSV	0.025
Indeno(1,2,3-cd)pyrene	3 / 5	920	N/A	1,000	(1)	N	BSV	0.92
2-Methylnaphthalene	2 / 5	370	N/A	N/A		Y		N/A
Naphthalene	2 / 5	290	N/A	5,000	(11)	N	BSV	0.058
Phenanthrene	5 / 5	5,900	N/A	5,000	(11)	Y		1.2
Pyrene	5 / 5	4,800	N/A	10,000	(11)	N	BSV	0.48
PCBs/Pesticides (ug/kg)								
Aldrin	3 / 5	2.8	N/A	N/A		Y		N/A
beta-BHC	1 / 5	0.96	N/A	100	(2, 3)	N	BSV	0.0096
alpha-Chlordane	3 / 5	1.0	0.27	500	(1)	N	BSV	0.0020
gamma-Chlordane	3 / 5	4.0	N/A	500	(1)	N	BSV	0.0080
4,4'-DDD	4 / 5	5.0	2.6	100	(2, 7)	N	BSV	0.050
4,4'-DDE	3 / 5	2.4	4.9	100	(2, 7)	N	BSV	0.024
4,4'-DDT	4 / 5	9.3	7.7	100	(2)	N	BSV	0.093
Dieldrin	1 / 5	1.7	2.1	10	(8)	N	BSV	0.17
Endosulfan II	3 / 5	2.0	1.0	100	(9)	N	BSV	0.020
Endrin	5 / 5	3.5	N/A	N/A		Y		N/A
Endrin Ketone	1 / 5	5.6	N/A	N/A		Y		N/A
Heptachlor Epoxide	3 / 5	1.8	2.0	50	(2, 10)	N	BSV	0.036
Methoxychlor	2 / 5	19	1.8	N/A		Y		N/A
Aroclor-1016	1 / 5	2.2	N/A	N/A		N	DF	N/A
Metals (mg/kg)								
Aluminum	5 / 5	7,660	9,630	N/A		N	BKGD	N/A
Antimony	2 / 5	53	N/A	4.5	(2)	Y		12
Arsenic	5 / 5	49	7.6	60	(12)	N	BSV	0.82
Barium	5 / 5	342	32	400	(13)	N	BSV	0.85
Beryllium	1 / 5	0.85	N/A	1	(13)	N	DF	0.85
Cadmium	1 / 5	1.0	N/A	20	(2)	N	BSV	0.050
Calcium	5 / 5	6,090	949	N/A		N	EAN	N/A
Chromium	4 / 5	87	N/A	0.4	(12)	Y		219
Cobalt	4 / 5	14	N/A	50	(11)	N	BSV	0.28
Copper	5 / 5	3,135	8.9	50	(12)	Y		63
Cyanide	2 / 5	0.94	N/A	50	(11)	N	BSV	0.019
Iron	5 / 5	101,350	8,350	N/A		Y		N/A
Lead	4 / 5	2,370	102	500	(12)	Y		4.7
Magnesium	5 / 5	4,225	1,480	N/A		N	EAN	N/A
Manganese	5 / 5	917	206	1500	(2)	N	BSV	0.61
Mercury	1 / 5	0.19	N/A	0.1	(12)	Y		1.9
Nickel	3 / 5	46	N/A	200	(12)	N	BSV	0.23
Potassium	3 / 5	1,660	N/A	N/A		N	EAN	N/A
Selenium	2 / 5	5.5	N/A	70	(12)	N	BSV	0.079
Sodium	1 / 5	13,000	N/A	N/A		N	EAN	N/A
Thallium	1 / 5	0.57	N/A	N/A		N	DF	N/A
Vanadium	5 / 5	18	14	150	(2)	N	BSV	0.12
Zinc	5 / 5	821	47	200	(12)	Y		4.1

TABLE G-10
SOIL COPC SCREENING
B&M LOCOMOTIVE SHOP DISPOSAL AREA
Iron Horse Park Superfund Site, OU3
North Billerica, MA

Analyte	Frequency of Detection	Maximum Soil Conc.	Maximum Background Soil Conc.	Ecological Soil Screening Level	Source of Ecological Screening Level	COC?	Reason	Hazard Quotient (a)

a. In this screening table, the hazard quotient is calculated by dividing the maximum detection by the screening value.
N/A - Not Applicable or Not Available
COC - Contminant of Concern
BSV - Below screening value
DF - Dection frequency less than 5% site-wide
EAN- Essential animal nutrient
BKGD - Background comparison

Sources:
1. Fitchko (1989).
2. Maximum allowable soil concentration in the former Soviet Union (as cited in Beyer 1990).
3. Value for gamma-BHC(Lindane) conservatively used.
4. Indicative of moderate soil contamination as designated by the soil cleanup criteria of Quebec (as cited in Beyer 1990).
5. Acceptable concentration proposed by Ontario Ministry of Environment (as cited in Beyer 1990).
6. Kappleman (1993).
7. For Screening purposes, maximum allowable DDT concentration was used for DDE and DDT.
8. Decreased cocoon production by Eisenia fetida (Reinecke and Venter 1985 as cited in Beyer 1990).
9. Tenative allowable concentration for endosulfan in the former Soviet Union (as cited in Beyer 1990).
10. Value for heptachlor.
11. Soil criteria for evaluating the severity of contamination under the Dutch Soil Cleanup (Interim) Act (as cited in Beyer 1990).
12. Will and Suter (1994).
13. Guidelines for the New Jersey Environmental Cleanup Responsibility Act (as cited in Beyer 1990).

TABLE 7-1. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR B&M RAILROAD LANDFILL

	No Action	Institutional Actions	InSitu-1	SC-1 (SELECTED ALTERNATIVE)
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective			
Protection of Human Health: Does not exceed risk limits	N/A	N/A	N/A	■
Ecological Protection:	□	□	□	■
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets			
	□	□	□	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective			
Magnitude of Residual Risk - Human Health: Does not exceed risk limits	N/A	N/A	N/A	■
Magnitude of Residual Risk - Ecological:	□	□	□	■
Reduction of Toxicity, Mobility and Volume through Treatment				
Treatment/Recycling Processes Utilized	None	None	None	None
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High			
	N/A - No treatment	N/A - No treatment	N/A - No treatment	N/A - No treatment
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High			
	N/A - No treatment	N/A - No treatment	N/A - No treatment	N/A - No treatment
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible			
	N/A - No treatment	N/A - No treatment	N/A - No treatment	N/A - No treatment
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low			
	N/A - No treatment	N/A - No treatment	N/A - No treatment	N/A - No treatment
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts			
Protection of Community and Workers During Remedial Actions	■	■	■	■
Environmental Impacts	■	■	■	◪
Time Until Remedial Action Objectives are Achieved	>30 years	>30 years	>30 years	2 years
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability			
Technical Feasibility:				
Construction, operation & maintenance	■	■	■	◪
Reliability in achieving RAOs	□	□	◪	■
Implementation of future actions	■	■	■	◪
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort			
	■	■	■	■
[illegible]	[illegible] - Moderate Effort & Availability, ■ - Low Effort/Commonly Available			
	■	■	■	■
Cost				
Capital ($million)	$0.00	$0.16	$0.16	$8.87
O&M ($million)	$0.00	$0.12	$0.19	$0.17
Total ($million)	$0.00	$0.28	$0.35	$9.04
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$0.62	$0.62	$0.62

N/A - Not Applicable

TABLE 7-3. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR RSI LANDFILL

	No Action	SC-1 (as part of groundwater source control) (SELECTED ALTERNATIVE)
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective	
Protection of Human Health: Does not exceed risk limits	N/A	■
Ecological Protection: Does not exceed risk limits	N/A	N/A
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets	
	□	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective	
Magnitude of Residual Risk - Human Health: Does not exceed risk limits	N/A	■
Magnitude of Residual Risk - Ecological: Does not exceed risk limits	N/A	N/A
Reduction of Toxicity, Mobility and Volume through Treatment		
Treatment/Recycling Processes Utilized	None	None
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High	
	N/A	N/A
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High	
	N/A	N/A
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible	
	N/A	N/A
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low	
	N/A	N/A
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts	
Protection of Community and Workers During Remedial Actions	■	■
Environmental Impacts	■	◪
Time Until Remedial Action Objectives are Achieved	N/A	N/A(1)
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability	
Technical Feasibility:		
Construction, operation & maintenance	■	◪
Reliability in achieving RAOs	N/A	N/A(1)
Implementation of future actions	■	◪
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort	
	■	■
Availability of Services and Materials	□ - High Effort/Not Commonly Available, ◪ - Moderate Effort & Availability, ■ - Low Effort/Commonly Available	
	■	■
Cost		
Capital ($million)	$0.00	$1.84
O&M ($million)	$0.00	$0.03
Total ($million)	$0.00	$1.87
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$0.62

N/A - Not Applicable

(1) There are no remedial action objectives (RAOs) for contaminated soils at this AOC. However, RAOs exist for groundwater, and installation of a cap is a groundwater source control remedy. RAOs for groundwater source control are expected to be achieved in 2 years and capping for groundwater source control is considered highly reliable.

TABLE 7-5. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR B&M LOCOMOTIVE SHOP DISPOSAL AREAS

	No Action	Institutional Actions	In-Situ-1	SC-1 (SELECTED ALTERNATIVE)	SC-2	On-Site-1	On-Site-2
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective						
Protection of Human Health:	□	□	□	■	■	■	■
Ecological Protection:	□	□	□	■	■	■	■
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets						
	□	□	□	■	■	■	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective						
Magnitude of Residual Risk - Human Health:	□	□	□	■	■	■	■
Magnitude of Residual Risk - Ecological:	□	□	□	■	■	■	■
Reduction of Toxicity, Mobility and Volume through Treatment							
Treatment/Recycling Processes Utilized	None	None	None	None	None	Solidification/ Stabilization	Soil Washing/ Chemical Extraction
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High						
	N/A	N/A	N/A	N/A	N/A	■	■
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High						
	N/A	N/A	N/A	N/A	N/A	■	■
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible						
	N/A	N/A	N/A	N/A	N/A	◪	■
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low						
	N/A	N/A	N/A	N/A	N/A	■	◪
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts						
Protection of Community and Workers During Remedial Actions	■	■	■	■	■	■	■
Environmental Impacts	■	■	■	◪	◪	◪	◪
Time Until Remedial Action Objectives are Achieved	>30 years	>30 years	>30 years	2 years	2 years	3 years	3 years
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability						
Technical Feasibility:							
Construction, operation & maintenance	■	■	■	◪	◪	◪	◪
Reliability in achieving RAOs	□	□	◪	■	■	■	■
Implementation of future actions	■	■	■	◪	◪	◪	◪
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort						
	■	■	■	■	■	■	■
Availability of Services and Materials	□ - High Effort/Not Commonly Available, ◪ - Moderate Effort & Availability, ■ - Low Effort/Commonly Available						
	■	■	■	■	■	◪	◪
Cost							
Capital ($million)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$33.63	$42.06
O&M ($million)	$0.00	$0.11	$0.17	$0.12	$0.00	$0.00	$0.00
Total ($million)	$0.00	$0.24	$0.30	$2.08	$8.15	$33.63	$42.06
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53

N/A - Not Applicable

TABLE 7-7. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR OLD B&M OIL/SLUDGE RECYCLING AREA

	No Action	Institutional Actions	InSite-1	SC-1 (SELECTED ALTERNATIVE)	SC-2	OnSite-1	OnSite-2
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective						
Protection of Human Health:	□	□	□	■	■	■	■
Ecological Protection: Does not exceed risk limits	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets						
	□	□	□	■	■	■	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective						
Magnitude of Residual Risk - Human Health:	□	□	□	■	■	■	■
Magnitude of Residual Risk - Ecological: Does not exceed risk limits	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reduction of Toxicity, Mobility and Volume through Treatment							
Treatment/Recycling Processes Utilized	None	None	None	None	None	Solidification/ Stabilization	Soil Washing/ Chemical Extraction
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High						
	N/A	N/A	N/A	N/A	N/A	■	■
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High						
	N/A	N/A	N/A	N/A	N/A	■	■
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible						
	N/A	N/A	N/A	N/A	N/A	◪	■
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low						
	N/A	N/A	N/A	N/A	N/A	■	◪
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts						
Protection of Community and Workers During Remedial Actions	■	■	■	■	■	■	■
Environmental Impacts	■	■	■	◪	◪	◪	◪
Time Until Remedial Action Objectives are Achieved	>30 years	>30 years	>30 years	2 years	2 years	2 years	2 years
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability						
Technical Feasibility:							
Construction, operation & maintenance	■	■	■	◪	◪	◪	◪
Reliability in achieving RAOs	□	□	◪	■	■	■	■
Implementation of future actions	■	■	■	◪	◪	◪	◪
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort						
	■	■	■	■	■	■	■
Availability of Services and Materials	□ - High Effort/Not Commonly Available, ◪ - Moderate Effort & Availability, ■ - Low Effort/Commonly Available						
	■	■	■	■	■	◪	◪
Cost							
Capital ($million)	$0.00	$0.12	$0.12	$1.16	$4.99	$15.60	$20.56
O&M ($million)	$0.00	$0.11	$0.16	$0.33	$0.00	$0.00	$0.00
Total ($million)	$0.00	$0.23	$0.28	$1.49	$4.99	$15.60	$20.56
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$0.62	$0.62	$0.62	$0.62	$0.62	$0.62

N/A - Not Applicable

TABLE 7-9. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR CONTAMINATED SOILS AREA

	No Action	Institutional Actions	InSitu-1	InSitu-2	InSitu-3	SC-1 (SELECTED ALTERNATIVE)	Off Site	OnSite-1	OnSite-2
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective								
Protection of Human Health:	□	□	□	■	■	■	■	■	■
Ecological Protection: Does not exceed risk limits	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets								
	□	□	□	■	■	■	■	■	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective								
Magnitude of Residual Risk - Human Health:	□	□	□	■	■	■	■	■	■
Magnitude of Residual Risk - Ecological: Does not exceed risk limits	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reduction of Toxicity, Mobility and Volume through Treatment									
Treatment/Recycling Processes Utilized	None	None	None	Solidification/Stabilization	Enhanced Biodegr./ Soil Flushing	None	Assume Off Site Solidification/Stabilization	Solidification/Stabilization	Soil Washing/ Chemical Extraction
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High								
	N/A	N/A	N/A	■	■	N/A	■	■	■
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High								
	N/A	N/A	N/A	◪	◪	N/A	■	■	■
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible								
	N/A	N/A	N/A	◪	■	N/A	■	◪	■
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low								
	N/A	N/A	N/A	■	■	N/A	■	■	◪
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts								
Protection of Community and Workers During Remedial Actions	■	■	■	■	■	■	■	■	■
Environmental Impacts	■	■	■	◪	◪	◪	◪	◪	◪
Time Until Remedial Action Objectives are Achieved	>30 years	>30 years	>30 years	2 years	2 years	2 years	2 years	2 years	2 years
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability								
Technical Feasibility:									
Construction, operation & maintenance	■	■	■	◪	◪	◪	◪	◪	◪
Reliability in achieving RAOs	□	□	□	◪	■	■	■	■	■
Implementation of future actions	■	■	■	◪	◪	◪	◪	◪	◪
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort								
	■	■	■	■	■	■	■	■	■
Availability of Services and Materials	□ - High Effort/Not Commonly Available, ◪ - Moderate Effort & Availability, ■ - Low Effort/Commonly Available								
	■	■	■	◪	■	■	◪	◪	◪
Cost									
Capital ($million)	$0.00	$0.15	$0.15	$1.06	$9.04	$0.89	$6.64	$7.01	$10.40
O&M ($million)	$0.00	$0.20	$0.24	$0.00	$0.00	$0.32	$0.00	$0.00	$0.00
Total ($million)	$0.00	$0.35	$0.39	$1.06	$9.04	$1.21	$6.64	$7.01	$10.40
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$1.19	$1.19	$1.19	$1.19	$1.19	$1.19	$1.19	$1.19

N/A - Not Applicable

TABLE 7-11. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR ASBESTOS LANDFILL

	No Action	Institutional Actions (SELECTED ALTERNATIVE)
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective	
Protection of Human Health:	◪	■
Ecological Protection: Does not exceed risk limits	N/A	N/A
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets	
	□	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective	
Magnitude of Residual Risk - Human Health:	◪	■
Magnitude of Residual Risk - Ecological: Does not exceed risk limits	N/A	N/A
Reduction of Toxicity, Mobility and Volume through Treatment		
Treatment/Recycling Processes Utilized	None	None
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High	
	N/A	N/A
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High	
	N/A	N/A
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible	
	N/A	N/A
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low	
	N/A	N/A
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts	
Protection of Community and Workers During Remedial Actions	N/A	■
Environmental Impacts	■	■
Time Until Remedial Action Objectives are Achieved	0 years	0 years (existing cap is protective)
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability	
Technical Feasibility:		
Construction, operation & maintenance	□	■
Reliability in achieving RAOs	◪	■
Implementation of future actions	□	■
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort	
	■	■
Availability of Services and Materials	[illegible] Availability, ◪ - Moderate Effort & Availability, ■ - Low Effort/Commonly Available	
	■	■
Cost		
Capital ($million)	$0.00	$0.20
O&M ($million)	$0.00	$0.20
Total ($million)	$0.00	$0.40
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$0.91

N/A - Not Applicable

TABLE 7-13. ABBREVIATED COMPARATIVE ANALYSIS OF THE REMEDIAL TECHNOLOGIES FOR ASBESTOS LAGOONS

	No Action	Institutional Actions	SC-1 (SELECTED ALTERNATIVE)	SC-2
Overall Protection of Human Health and the Environment	□ - No Protection, ◪ - Partially Protective, ■ - Protective			
Protection of Human Health:	□	□	■	■
Ecological Protection: Does not exceed risk limits	N/A	N/A	N/A	N/A
Compliance with ARARs	□ - Does Not Meet, ◪ - May Not Meet/Partially Meets, ■ - Meets			
	□	□	■	■
Long-Term Effectiveness And Permanence	□ - No Protection, ◪ - Partially Protective, ■ - Protective			
Magnitude of Residual Risk - Human Health:	□	◪	■	■
Magnitude of Residual Risk - Ecological: Does not exceed risk limits	N/A	N/A	N/A	N/A
Reduction of Toxicity, Mobility and Volume through Treatment				
Treatment/Recycling Processes Utilized	None	None	None	None
Amount of Hazardous Materials Treated or Recycled:	□ - Low, ◪ - Moderate, ■ - High			
	N/A	N/A	N/A	N/A
Degree of Expected Reductions in Toxicity, Mobility or Volume:	□ - Low, ◪ - Moderate, ■ - High			
	N/A	N/A	N/A	N/A
Irreversibility	□ - Reversible, ◪ - Moderately Reversible, ■ - Irreversible			
	N/A	N/A	N/A	N/A
Type and Quantity of [Process] Residuals	□ - High, ◪ - Moderate, ■ - Low			
	N/A	N/A	N/A	N/A
Short-Term Effectiveness	□ - High Impacts, ◪ - Moderate Impacts, ■ - Low Impacts			
Protection of Community and Workers During Remedial Actions	■	■	■	■
Environmental Impacts	■	■	◪	◪
Time Until Remedial Action Objectives are Achieved	>30 years	>30 years	2 years	2 years
Implementability	□ - High Effort/Low Reliability, ◪ - Moderate Effort/Moderate Reliability, ■ - Low Effort/High Reliability			
Technical Feasibility:				
Construction, operation & maintenance	■	■	◪	◪
Reliability in achieving RAOs	□	□	■	■
Implementation of future actions	■	■	◪	◪
Administrative Feasibility	□ - High Effort, ◪ - Moderate to High Effort, ■ - Low to Moderate Effort			
	■	■	■	■
Availability of Services and Materials	□ - High Effort/Not Commonly Available, ◪ - Moderate Effort & Availability, ■ - Low Effort/Commonly Available			
	■	■	■	■
Cost				
Capital ($million)	$0.00	$0.08	$2.15	$1.33
O&M ($million)	$0.00	$0.13	$0.11	$0.00
Total ($million)	$0.00	$0.21	$2.26	$1.33
Additional Groundwater Monitoring - Five years - Total ($million)	$0.00	$0.64	$0.64	$0.64

N/A - Not Applicable

TABLE L-1. COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - B&M Railroad Landfill

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
SOURCE CONTROL												
Horizontal Containment												
Composite / Double Barrier Cap												
Demolition, Removal & Disposal		11.0	AC	200.00	2,200	0.00	0	$50.00	110,000	12,000	132,000	$242,000
Site Preparation	Clearing & grubbing - very light effort (mow)	11.0	AC	48.00	528	0.00	0	$50.00	26,400	1,150.00	12,650	$39,050
Erosion Control	Haybale/silt fence perimeter	2,625	LF	0.05	131	1.75	4,594	$50.00	6,563		0	$11,156
Dust Control	Large effort during excavation and grading	1	LS	640.00	640	0.00	0	$50.00	32,000	56,000	56,000	$88,000
Waste Excavation	Excavate 50' width of waste, 5 feet deep	16,315	CY	0.10	1,632	0.00	0	$50.00	81,575	1.41	23,004	$104,579
Sheet Piling	Use for excavation along wetland perimeter	17,620	SF	0.08	1,410	12.00	211,440	$50.00	70,480	2.00	35,240	$317,160
Groundwater Collection and Treatment	Use during excavation, 50 gpm	1	LS	500.00	500	50,000	50,000	$50.00	25,000	10,000	10,000	$85,000
Backfill	Place in excavation, ordinary borrow	20,400	CY	0.10	2,040	12.00	244,800	$50.00	102,000	1.41	28,764	$375,564
Landfill Grading	Grade waste and slopes of landfill	11	AC	20.00	220	0.00	0	$50.00	11,000	600.00	6,600	$17,600
Soil Subgrade	Granular fill <1.5 inches, 12", 1 lift likely	21,800	CY	0.10	2,180	12.00	261,600	$50.00	109,000	2.00	43,600	$414,200
Gas Vent Layer	Sand layer - 12" thickness	21,800	CY	0.12	2,616	8.00	174,400	$50.00	130,800	1.65	35,970	$341,170
Geotextile	Typical, 12 oz.	52,229	SY	0.01	522	1.35	70,509	$50.00	26,115	0.05	2,611	$99,236
Low Permeability Soil ($\leq 10^{-4}$ cm/sec) - 12"	$k<10^{-4}$ cm/sec, clay/silt/soil mix	21,800	CY	0.12	2,616	15.00	327,000	$50.00	130,800	1.65	35,970	$493,770
Low Density PE Geomembrane - 60 mil	60 mil LDPE	470,063	SF	0.012	5,641	0.42	197,426	$50.00	282,038	0.05	23,503	$502,967
Drainage Geocomposite	Typical	470,063	SF	0.009	4,231	0.40	188,025	$50.00	211,528	0.05	23,503	$423,057
Cover Soil	Soil/gravel mix, 24"	43,500	CY	0.12	5,220	12.00	522,000	$50.00	261,000	1.65	71,775	$854,775
Topsoil	Loam/soil mix, 6"	10,880	CY	0.12	1,306	15.00	163,200	$50.00	65,280	1.65	17,952	$246,432
Perimeter Toe Drain	Construct along perimeter of cap	2,625	LF	0.00	0	0.00	0	$50.00	0		0	$0
Toe Drain stone	3/4-inch washed stone	148	CY	0.15	22	18.00	2,664	$50.00	1,110	2.00	296	$4,070
Drainage Pipe, 6" PVC, perforated	6" PVC perforated pipe with Toe Drain	2,625	LF	0.16	420	2.66	6,983	$50.00	21,000		0	$27,983
Hydroseed	Lawn mix, no clover	11.4	AC	14.00	160	1,100	12,540	$50.00	7,980	330.00	3,762	$24,282
Drainage Swales	Bottom width= 4', total width=12'	2,625	LF	0.10	263	0.00	0	$50.00	13,125	1.60	4,200	$17,325
Rip-Rap	Line drainage swale, 1' depth	1,200	CY	0.26	310	16.00	19,200	$50.00	15,480	8.00	9,600	$44,280
Crushed stone	Line bottom of drainage swales, 6 inches, 3/4"	200	CY	0.15	30	15.00	3,000	$50.00	1,500	2.00	400	$4,900

TABLE L-1. COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MH/ UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
Detention Basins	Use 2 basins, 100' x 75' x 4' depth	2,222	CY	0.10	222	0.00	0	$50.00	11,110	1.41	3,133	$14,243
Geotextile	Use for toe drains and swales, 12 oz.	4,083	SY	0.01	41	1.35	5,513	$50.00	2,042	0.05	204	$7,758
Gas Vents	Use 11 vents - typical vents & risers (~18 ft)	11	EA	30.00	330	400.00	4,400	$50.00	16,500	100.00	1,100	$22,000
Settling Monuments		2	EA	4.00	8	100.00	200	$50.00	400		0	$600
Piezometer Installation, 1" Sch. 80 PVC	6 @ 40ft deep	240	LF	0.30	72	6.00	1,440	$50.00	3,600	8.00	1,920	$6,960
Piezometer Wellheads - Corrugated HDPE Covers	6 piezometers	6	EA	1.00	6	100.00	600	$50.00	300		0	$900
Security Fencing - 8' Chain Link	Perimeter, top rail and bottom tension wire	3,150	LF	0.16	504	16.00	50,400	$50.00	25,200	3.00	9,450	$85,050
Gates - Double Swing Door (20')		2	EA	22.00	44	1,200	2,400	$50.00	2,200	370.00	740	$5,340
Signage -- Warning: Hazardous Waste Area		1	LS	2.00	2	100.00	100	$50.00	100		0	$200
Access Roadway - grading & compaction	10 ft wide, 1575 ft long	1,750	SY	0.05	84	0.00	0	$50.00	4,200	1.62	2,835	$7,035
Access Roadway - gravel	10 ft wide w/6" crushed stone	1,750	SY	0.03	49	7.70	13,475	$50.00	2,450	1.42	2,485	$18,410
SUBTOTAL DIRECT COSTS					36,197		2,537,909		1,809,875		599,268	$4,947,052
CONTRACTOR OVERHEAD & PROFIT		21.00%										$1,038,881
SUBTOTAL												$5,985,933
CONTRACTOR'S CONTINGENCY		20.00%										$1,197,187
SUBTOTAL (rounded)												$7,183,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$955,700
EPA/MADEP OVERSIGHT												$733,950
TOTAL CAPITAL - SOURCE CONTROL												$8,872,650

TABLE L-1. COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MH/ UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, overburden	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.30	72	6.00	1,440	$50.00	3,600	8.00	1,920	$6,960
Monitoring Well Installation, 2" PVC, bedrock	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.90	216	10.00	2,400	$50.00	10,800	24.00	5,760	$18,960
Steel Casing & Locks	12 wells	12	EA	1.00	12	100.00	1,200	$50.00	600		0	$1,800
Protective Bollards	2 per well	24	EA	1.20	29	160.00	3,840	$50.00	1,440		0	$5,280
MOB-DEMOB		1	LS	16.00	16		0	$50.00	800	1,200.00	1,200	$2,000
SUBTOTAL DIRECT COSTS					345		8,880		17,240		8,880	$35,000
CONTRACTOR OVERHEAD & PROFIT		21.00%										$7,350
SUBTOTAL												$42,350
CONTRACTOR'S CONTINGENCY		20.00%										$8,470
SUBTOTAL (rounded)												$51,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$2,550
EPA/MADEP OVERSIGHT												$7,650
TOTAL CAPITAL - MONITORING												$61,200
TOTAL CAPITAL												$8,933,850

TABLE L-1. COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Operation and Maintenance Costs for Remedy - B&M Railroad Landfill

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
SOURCE CONTROL								
n (years) = 30								
i (%) = 3								
d (%) = 7								
Horizontal Containment								
Composite / Double Barrier Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,000
General Maintenance		11.0	AC	Size of area to be capped	400	Putnam LF Closure/Post Closure Plan (Feb. 1998)	4,400	$75,000
SUBTOTAL COSTS							8,650	$147,000
CONTINGENCY	15.00%							$22,000
TOTAL O&M - SOURCE CONTROL								$169,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	13 locations	2	RD	Semi-annual monitoring	18,100	6 methods/groupings	36,200	$157,000
Field Sampling Costs	13 locations	2	RD	Semi-annual monitoring	18,500	6 methods/groupings	37,000	$160,400
Data Validation and Reporting	13 locations	2	RD	Semi-annual monitoring	18,700	6 methods/groupings	37,400	$162,200
Capital Repair / Replacement		3%		Percentage of direct capital cost	33,000		990	$4,300
SUBTOTAL COSTS							111,590	$484,000
CONTINGENCY	15.00%							$73,000
TOTAL O&M - SOURCE CONTROL								$557,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$726,000
TOTAL NET PRESENT VALUE OF REMEDY								$9,659,850

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre	i - interest rate	RD - round
CY - cubic yard	LF - linear foot	SF - square foot
d - discount rate	LS - lump sum	SY - square yard
EA - each	MH - manhours	UN - units
HR - hour		

TABLE L-2 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - RSI Landfill

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
SOURCE CONTROL												
Horizontal Containment												
Single Barrier Cap												
Site Preparation	Clearing & grubbing - very light effort (mow)	2.2	AC	48.00	106	0.00	0	$50.00	5,280	1,150.00	2,530	$7,810
Erosion Control	Haybale/silt fence perimeter	2,200	LF	0.05	110	1.75	3,850	$50.00	5,500		0	$9,350
Dust Control	During initial grading	2	MO	80.00	160	0.00	0	$50.00	8,000	7,000.00	14,000	$22,000
Soil Subgrade	Granular fill <1.5 inches, 12 lifts likely	14,335	CY	0.10	1,434	12.00	172,020	$50.00	71,675	2.00	28,670	$272,365
Gas Vent Layer	Sand layer - 12" thickness	4,450	CY	0.12	534	8.00	35,600	$50.00	26,700	1.65	7,343	$69,643
Geotextile	Typical, 12 oz.	10,640	SY	0.01	106	1.35	14,364	$50.00	5,320	0.05	532	$20,216
Low Density PE Geomembrane - 60 mil	60 mil LDPE	95,760	SF	0.012	1,149	0.42	40,219	$50.00	57,456	0.05	4,788	$102,463
Drainage Geocomposite	Typical	95,760	SF	0.009	862	0.40	38,304	$50.00	43,092	0.05	4,788	$86,184
Cover Soil	Soil/gravel mix, 24"	8,875	CY	0.12	1,065	12.00	106,500	$50.00	53,250	1.65	14,644	$174,394
Topsoil	Loam/soil mix, 6"	2,220	CY	0.12	266	15.00	33,300	$50.00	13,320	1.65	3,663	$50,283
Toe Drain stone	3/4-inch washed stone	47	CY	0.15	7	18.00	846	$50.00	353	2.00	94	$1,293
Drainage Pipe, 6" PVC, perforated	6" PVC perforated pipe with Toe Drain	1,260	LF	0.16	202	2.66	3,352	$50.00	10,080		0	$13,432
Hydroseed	Lawn mix, no clover	2.3	AC	14.00	32	1,100	2,530	$50.00	1,610	330.00	759	$4,899
Drainage Swales	Bottom width= 4', total width=12'	1,440	LF	0.10	144	0.00	0	$50.00	7,200	1.60	2,304	$9,504
Rip-Rap	Line drainage swale, 1' depth	640	CY	0.26	165	16.00	10,240	$50.00	8,256	8.00	5,120	$23,616
Crushed stone	Line bottom of drainage swales, 6 inches	110	CY	0.15	17	15.00	1,650	$50.00	825	2.00	220	$2,695
Detention Basins	Use 2 basins, 75' x 75' x 4' depth	1,670	CY	0.10	167	0.00	0	$50.00	8,350	1.41	2,355	$10,705
Geotextile	Use for toe drains and swales, 12 oz.	1,840	SY	0.01	18	1.35	2,484	$50.00	920	0.05	92	$3,496
Gas Vents	Use 4 vents - typical vents & risers (~18 ft)	4	EA	30.00	120	400.00	1,600	$50.00	6,000	100.00	400	$8,000
Settling Monuments		2	EA	4.00	8	100.00	200	$50.00	400		0	$600
Piezometer Installation, 1" Sch. 80 PVC	4 @ 40ft deep	160	LF	0.30	48	6.00	960	$50.00	2,400	8.00	1,280	$4,640
Piezometer Wellheads - Corrugated HDPE Covers	4 piezometers	4	EA	1.00	4	100.00	400	$50.00	200		0	$600
Security Fencing - 8' Chain Link	Perimeter, top rail and bottom tension wire	2,200	LF	0.16	352	16.00	35,200	$50.00	17,600	3.00	6,600	$59,400
Gates - Double Swing Door (20')		2	EA	22.00	44	1,200	2,400	$50.00	2,200	370.00	740	$5,340
Signage -- Restricted Personnel Only		1	LS	2.00	2	100.00	100	$50.00	100		0	$200
Access Roadway - grading & compaction	10 ft wide, 150 ft long	200	SY	0.05	10	0.00	0	$50.00	480	1.62	324	$804

TABLE L-2 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
Access Roadway - gravel	10 ft wide w/6" crushed stone	200	SY	0.03	6	7.70	1,540	$50.00	280	1.42	284	$2,104
SUBTOTAL DIRECT COSTS					7,137		507,659		356,847		101,529	$966,034
CONTRACTOR OVERHEAD & PROFIT		21.00%										$202,867
SUBTOTAL												$1,168,901
CONTRACTOR'S CONTINGENCY		20.00%										$233,780
SUBTOTAL (rounded)												$1,403,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$249,256
EPA/MADEP OVERSIGHT												$188,061
TOTAL CAPITAL - SOURCE CONTROL												$1,840,317
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, overburden	2 clusters (clstr=1SOB, 1DOB, 1BR)	120	LF	0.30	36	6.00	720	$50.00	1,800	8.00	960	$3,480
Monitoring Well Installation, 2" PVC, bedrock	2 clusters (clstr=1SOB, 1DOB, 1BR)	120	LF	0.90	108	10.00	1,200	$50.00	5,400	24.00	2,880	$9,480
Mobilize/Demobilize Drilling S/C	1time	1	EA	16.00	16	0.00	0	$50.00	800	1,200.00	1,200	$2,000
Steel Casing & Locks	6 wells	6	EA	1.00	6	100.00	600	$50.00	300		0	$900
Protective Bollards	2 per well	12	EA	1.20	14	160.00	1,920	$50.00	720		0	$2,640
SUBTOTAL DIRECT COSTS					180		4,440		9,020		5,040	$18,500
CONTRACTOR OVERHEAD & PROFIT		21.00%										$3,885
SUBTOTAL												$22,385
CONTRACTOR'S CONTINGENCY		20.00%										$4,477
SUBTOTAL (rounded)												$27,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$1,350
EPA/MADEP OVERSIGHT												$4,050
TOTAL CAPITAL - MONITORING												$32,400
TOTAL CAPITAL												$1,872,717

TABLE L-2 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Operation and Maintenance Costs for Remedy - RSI Landfill

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
SOURCE CONTROL								
n (years) = 30								
i (%) = 3								
d (%) = 7								
Horizontal Containment								
Single Barrier Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,000
General Maintenance		2.2	AC	Size of area to be capped	400	Putnam LF Closure/Post Closure Plan (Feb. 1998)	880	$15,000
SUBTOTAL COSTS							5,130	$87,000
CONTINGENCY	15.00%							$13,000
TOTAL O&M - SOURCE CONTROL								$100,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	13 locations	2	RD	Semi-annual monitoring	18,600	7 methods/groupings	37,200	$161,300
Field Sampling Costs	13 locations	2	RD	Semi-annual monitoring	18,600	7 methods/groupings	37,200	$161,300
Data Validation and Reporting	13 locations	2	RD	Semi-annual monitoring	21,700	7 methods/groupings	43,400	$188,200
Capital Repair / Replacement		3%		Percentage of direct capital cost	18,500		555	$2,400
SUBTOTAL COSTS							118,355	$513,000
CONTINGENCY	15.00%							$77,000
TOTAL O&M - SOURCE CONTROL								$590,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$690,000
TOTAL NET PRESENT VALUE OF REMEDY								$2,562,717

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre
CY - cubic yard
d - discount rate
EA - each
HR - hour
i - interest rate
LF - linear foot
LS - lump sum
MH - manhours
RD - round
SF - square foot
SY - square yard
UN - units

TABLE L-3 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - B&M Locomotive Shop Disposal Areas

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
SOURCE CONTROL												
Horizontal Containment												
Single Barrier Cap												
Site Preparation	Clearing & grubbing - very light effort (mow)	4.7	AC	48.00	226	0.00	0	$50.00	11,280	1,150.00	5,405	$16,685
Erosion Control	Haybale/silt fence perimeter	3,000	LF	0.05	150	1.75	5,250	$50.00	7,500		0	$12,750
Dust Control	During initial grading	1	MO	80.00	80	0.00	0	$50.00	4,000	7,000.00	7,000	$11,000
Soil Subgrade/Gas Vent Layer	Sand fill (12 inches)	9,478	CY	0.05	474	10.00	94,783	$50.00	23,696	2.00	18,957	$137,436
LDPE Geomembrane	60 mil	204,732	SF	0.012	2,457	0.42	85,987	$30.00	73,704	0.05	10,237	$169,928
Drainage Geocomposite	Typical	204,732	SF	0.009	1,843	0.40	81,893	$30.00	55,278	0.05	10,237	$147,407
Cover Soil	Soil/gravel mix, 24"	18,957	CY	0.05	948	10.00	189,567	$50.00	47,392	1.65	31,279	$268,237
Topsoil	Loam/soil mix, 6"	4,739	CY	0.12	569	15.00	71,088	$50.00	28,435	1.65	7,820	$107,342
Toe Drain stone	3/4-inch washed stone	47	CY	0.15	7	18.00	846	$50.00	353	2.00	94	$1,293
Hydroseed	Lawn mix, no clover	4.7	AC	14.00	66	1,100	5,170	$50.00	3,290	330.00	1,551	$10,011
Drainage Swales	Bottom width– 4', total width–12'	1,440	LF	0.10	144	0.00	0	$50.00	7,200	1.60	2,304	$9,504
Rip-Rap	Line drainage swale, 1' depth	640	CY	0.26	165	16.00	10,240	$50.00	8,256	8.00	5,120	$23,616
Crushed stone	Line bottom of drainage swales, 6 inches	110	CY	0.15	17	15.00	1,650	$50.00	825	2.00	220	$2,695
Geotextile	Use for toe drains and swales, 12 oz.	1,840	SY	0.01	18	1.35	2,484	$50.00	920	0.05	92	$3,496
Gas Vents	Use 4 vents - typical vents & risers (~18 ft)	4	EA	30.00	120	400.00	1,600	$50.00	6,000	100.00	400	$8,000
Settling Monuments		2	EA	4.00	8	100.00	200	$50.00	400		0	$600
Piezometer Installation, 1" Sch. 80 PVC	4 @ 40ft deep	160	LF	0.30	48	6.00	960	$50.00	2,400	8.00	1,280	$4,640
Piezometer Wellheads - Corrugated HDPE Covers	4 piezometers	4	EA	1.00	4	100.00	400	$50.00	200		0	$600
Security Fencing - 8' Chain Link	Perimeter, top rail and bottom tension wire	3,000	LF	0.16	480	16.00	48,000	$50.00	24,000	3.00	9,000	$81,000
Gates - Double Swing Door (20')		2	EA	22.00	44	1,200	2,400	$50.00	2,200	370.00	740	$5,340
Signage -- Restricted Personnel Only		1	LS	2.00	2	100.00	100	$50.00	100		0	$200
Access Roadway - grading & compaction	10 ft wide, 150 ft long	200	SY	0.05	10	0.00	0	$50.00	480	1.62	324	$804
Access Roadway - gravel	10 ft wide w/6" crushed stone	200	SY	0.03	6	7.70	1,540	$50.00	280	1.42	284	$2,104
Culvert Access to Large Area	18 foot wide earthern culvert with dual 24 inch CMP	1	LS									$10,000

TABLE L-3 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MH/ UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
SUBTOTAL DIRECT COSTS					7,883		604,158		308,187		112,342	$1,034,687
CONTRACTOR OVERHEAD & PROFIT		21.00%										$217,284
SUBTOTAL												$1,251,971
CONTRACTOR'S CONTINGENCY		20.00%										$250,394
SUBTOTAL (rounded)												$1,502,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$261,356
EPA/MADEP OVERSIGHT												$197,411
TOTAL CAPITAL - SOURCE CONTROL												$1,960,767
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, overburden	3 clusters (clstr=1SOB, 1DOB, 1BR)	180	LF	0.30	54	6.00	1,080	$50.00	2,700	8.00	1,440	$5,220
Monitoring Well Installation, 2" PVC, bedrock	3 clusters (clstr=1SOB, 1DOB, 1BR)	180	LF	0.90	162	10.00	1,800	$50.00	8,100	24.00	4,320	$14,220
Mobilize/Demobilize Drilling S/C	1 time	1	EA	16.00	16	0.00	0	$50.00	800	1,200.00	1,200	$2,000
Steel Casing & Locks	9 wells	9	EA	1.00	9	100.00	900	$50.00	450		0	$1,350
Protective Bollards	2 per well	18	EA	1.20	22	160.00	2,880	$50.00	1,080		0	$3,960
SUBTOTAL DIRECT COSTS					263		6,660		13,130		6,960	$26,750
CONTRACTOR OVERHEAD & PROFIT		21.00%										$5,618
SUBTOTAL												$32,368
CONTRACTOR'S CONTINGENCY		20.00%										$6,474
SUBTOTAL (rounded)												$39,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$1,950
EPA/MADEP OVERSIGHT												$5,850
TOTAL CAPITAL - MONITORING												$46,800
TOTAL CAPITAL												$2,007,567

TABLE L-3 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Operation and Maintenance Costs for Remedy - B&M Locomotive Shop Disposal Areas

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
SOURCE CONTROL								
n (years) = 30								
i (%) = 3								
d (%) = 7								
Horizontal Containment								
Single Barrier Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,000
General Maintenance		4.7	AC	Size of area to be capped	400	Putnam LF Closure/Post Closure Plan (Feb. 1998)	1,880	$32,000
SUBTOTAL COSTS							6,130	$104,000
CONTINGENCY	15.00%							$16,000
TOTAL O&M - SOURCE CONTROL								$120,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	13 locations	2	RD	Semi-annual monitoring	12,100	5 methods/groupings	24,200	$104,900
Field Sampling Costs	13 locations	2	RD	Semi-annual monitoring	20,500	5 methods/groupings	41,000	$177,800
Data Validation and Reporting	13 locations	2	RD	Semi-annual monitoring	15,600	5 methods/groupings	31,200	$135,300
Capital Repair / Replacement		3%		Percentage of direct capital cost	26,750		803	$3,500
SUBTOTAL COSTS							97,203	$422,000
CONTINGENCY	15.00%							$63,000
TOTAL O&M - SOURCE CONTROL								$485,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$605,000
TOTAL NET PRESENT VALUE OF REMEDY								$2,612,567

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre
CY - cubic yard
d - discount rate
EA - each
HR - hour
i - interest rate
LF - linear foot
LS - lump sum
MH - manhours
RD - round
SF - square foot
SY - square yard
UN - units

TABLE L-4 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - Old B&M Oil/Sludge Recycling Area

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MH/ UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
SOURCE CONTROL												
Horizontal Containment												
Single Barrier Cap												
Demolition, Removal & Disposal	Includes asphalt removal of entire area	7.0	AC	200.00	1,400	0.00	0	$50.00	70,000	12,000	84,000	$154,000
Site Preparation		7.0	AC	48.00	336	0.00	0	$50.00	16,800	1,150	8,050	$24,850
Erosion Control	Perimeter	2,100	LF	0.05	105	1.75	3,675	$50.00	5,250		0	$8,925
Dust Control		1	LS	160.00	160	0.00	0	$50.00	8,000	14,000	14,000	$22,000
Excavation and Grading	Assume excavate 5 inches and grade entire area	4,707	CY	0.10	471	0.00	0	$50.00	23,534	1.41	6,637	$30,171
Gravel Base Course, 2"	Entire area	1,883	CY	0.12	226	15.00	28,241	$50.00	11,296	1.65	3,106	$42,644
Bituminous Concrete Intermediate Course, 3"	Entire area	33,900	SY	0.018	610	3.89	131,871	$50.00	30,510	0.35	11,865	$174,246
Bituminous Concrete Surface Course, 1"	Entire area	33,900	SY	0.009	305	1.53	51,867	$50.00	15,255	0.19	6,441	$73,563
Concrete / Granite Edging, 4 1/2" x 12"	Assume half of perimeter	1,050	LF	0.187	196	5.00	5,250	$50.00	9,818	2.09	2,195	$17,262
Concrete / Granite Curb, 6" x 18"	Assume half of perimeter	1,050	LF	0.096	101	1.77	1,859	$50.00	5,040		0	$6,899
Manhole Repositioning	Assume 2 per acre	14	EA	0.34	5	0.00	0	$50.00	238	30.50	427	$665
Catchbasin / Drain Repositioning	Assume 2 per acre	14	EA	0.34	5	0.00	0	$50.00	238	30.50	427	$665
SUBTOTAL DIRECT COSTS					3,920		222,762		195,979		137,148	$555,889
CONTRACTOR OVERHEAD & PROFIT		21.00%										$116,737
SUBTOTAL												$672,625
CONTRACTOR'S CONTINGENCY		20.00%										$134,525
SUBTOTAL (rounded)												$807,000
BIDDING/DESIGN/CONSTRUCTION												$200,000
SUPERVISION												$150,000
EPA/MADEP OVERSIGHT												
TOTAL CAPITAL - SOURCE CONTROL												$1,157,000

TABLE L-4 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MH/ UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, *overburden*	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.30	72	6.00	1,440	$50.00	3,600	8.00	1,920	$6,960
Monitoring Well Installation, 2" PVC, bedrock	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.90	216	10.00	2,400	$50.00	10,800	24.00	5,760	$18,960
Mobilize/Demobilize Drilling S/C	1 time	1	EA	16.00	16	0.00	0	$50.00	800	1,200.00	1,200	$2,000
Steel Casing & Locks	12 wells	12	EA	1.00	12	100.00	1,200	$50.00	600		0	$1,800
Protective Bollards	2 per well	24	EA	1.20	29	160.00	3,840	$50.00	1,440		0	$5,280
SUBTOTAL DIRECT COSTS					345		8,880		17,240		8,880	$35,000
CONTRACTOR OVERHEAD & PROFIT		21.00%										$7,350
SUBTOTAL												$42,350
CONTRACTOR'S CONTINGENCY		20.00%										$8,470
SUBTOTAL (rounded)												$51,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$2,550
EPA/MADEP OVERSIGHT												$7,650
TOTAL CAPITAL - MONITORING												$61,200
TOTAL CAPITAL												$1,218,200

TABLE 1.-4 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Operation and Maintenance Costs for Remedy - Old B&M Oil/Sludge Recycling Area

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
SOURCE CONTROL								
n (years) = 30								
i (%) = 3								
d (%) = 7								
Horizontal Containment								
Single Barrier Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,400
General Maintenance		1,695	SY	Replace 50% of both asphalt layers every 10 years	7.31	Price for both asphalt layers	12,390	$211,000
SUBTOTAL COSTS							16,640	$283,400
CONTINGENCY	15.00%							$43,000
TOTAL O&M - SOURCE CONTROL								$326,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	13 locations	2	RD	Semi-annual monitoring	18,100	6 methods/groupings	36,200	$157,000
Field Sampling Costs	13 locations	2	RD	Semi-annual monitoring	18,500	6 methods/groupings	37,000	$160,400
Data Validation and Reporting	13 locations	2	RD	Semi-annual monitoring	18,700	6 methods/groupings	37,400	$162,200
Capital Repair / Replacement		3%		Percentage of direct capital cost	35,000		1,050	$4,600
SUBTOTAL COSTS							111,650	$484,000
CONTINGENCY	15.00%							$73,000
TOTAL O&M - SOURCE CONTROL								$557,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$883,000
TOTAL NET PRESENT VALUE OF REMEDY								$2,101,200

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre
CY - cubic yard
d - discount rate
EA - each
HR - hour
i - interest rate
LF - linear foot
LS - lump sum
MH - manhours
RD - round
SF - square foot
SY - square yard
UN - units

TABLE L-5 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - Contaminated Soils Area

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
SOURCE CONTROL												
Horizontal Containment												
Single Barrier Cap												
Demolition, Removal & Disposal	Includes asphalt removal for half the area	6.7	AC	200.00	1,343	0.00	0	$50.00	67,149	12,000	80,579	$147,727
Site Preparation		6.7	AC	48.00	322	0.00	0	$50.00	16,080	1,150	7,705	$23,785
Erosion Control	Assume perimeter of PRG exceedance area plus	3,000	LF	0.05	150	1.75	5,250	$50.00	7,500		0	$12,750
Dust Control		1	LS	160.00	160	0.00	0	$50.00	8,000	14,000	14,000	$22,000
Excavation and Grading		2,400	CY	0.10	240	0.00	0	$50.00	12,000	1.41	3,384	$15,384
Gravel Base Course, 2"	Only on areas not currently paved - Assume half the area	903	CY	0.12	108	15.00	13,542	$50.00	5,417	1.65	1,490	$20,448
Bituminous Concrete Intermediate Course, 3"	Entire area	32,500	SY	0.018	585	3.89	126,425	$50.00	29,250	0.35	11,375	$167,050
Bituminous Concrete Surface Course, 1"	Entire area	32,500	SY	0.009	293	1.53	49,725	$50.00	14,625	0.19	6,175	$70,525
Concrete / Granite Edging, 4 1/2" x 12"	Assume half of perimeter	1,400	LF	0.187	262	5.00	7,000	$50.00	13,090	2.09	2,926	$23,016
Concrete / Granite Curb, 6" x 18"	Assume half of perimeter	1,400	LF	0.096	134	1.77	2,478	$50.00	6,720		0	$9,198
Manhole Repositioning	Assume 2 per acre	14	EA	0.34	5	0.00	0	$50.00	238	30.50	427	$665
Catchbasin / Drain Repositioning	Assume 2 per acre	14	EA	0.34	5	0.00	0	$50.00	238	30.50	427	$665
SUBTOTAL DIRECT COSTS					3,606		204,420		180,306		128,487	$513,213
CONTRACTOR OVERHEAD & PROFIT		21.00%										$107,775
SUBTOTAL												$620,988
CONTRACTOR'S CONTINGENCY		20.00%										$124,198
SUBTOTAL (rounded)												$745,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$37,250
EPA/MADEP OVERSIGHT												$111,750
TOTAL CAPITAL - SOURCE CONTROL												$894,000

TABLE L-5 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MH/ UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, overburden	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.30	72	6.00	1,440	$50.00	3,600	8.00	1,920	$6,960
Monitoring Well Installation, 2" PVC, bedrock	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.90	216	10.00	2,400	$50.00	10,800	24.00	5,760	$18,960
Steel Casing & Locks	12 wells	12	EA	1.00	12	100.00	1,200	$50.00	600		0	$1,800
Protective Bollards	2 per well	24	EA	1.20	29	160.00	3,840	$50.00	1,440		0	$5,280
MOB-DEMOB		1	LS	16.00	16	0.00	0	$50.00	800	1,200.00	1,200	$2,000
SUBTOTAL DIRECT COSTS					345		8,880		17,240		8,880	$35,000
CONTRACTOR OVERHEAD & PROFIT		21.00%										$7,350
SUBTOTAL												$42,350
CONTRACTOR'S CONTINGENCY		20.00%										$8,470
SUBTOTAL (rounded)												$51,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$2,550
EPA/MADEP OVERSIGHT												$7,650
TOTAL CAPITAL - MONITORING												$61,200
TOTAL CAPITAL												$955,200

TABLE 1-5 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Operation and Maintenance Costs for Remedy - Contaminated Soils Area

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
SOURCE CONTROL								
n (years) = 30								
i (%) = 3								
d (%) = 7								
Horizontal Containment								
Single Barrier Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,000
General Maintenance		1,625	SY	Replace 50% of both asphalt layers every 10 years	7.31	Price for both asphalt layers	11,879	$202,000
SUBTOTAL COSTS							16,129	$274,000
CONTINGENCY	15.00%							$41,000
TOTAL O&M - SOURCE CONTROL								$315,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	25 locations	2	RD	Semi-annual monitoring	35,200	6 methods/groupings	70,400	$305,300
Field Sampling Costs	25 locations	2	RD	Semi-annual monitoring	40,900	6 methods/groupings	81,800	$354,700
Data Validation and Reporting	25 locations	2	RD	Semi-annual monitoring	36,700	6 methods/groupings	73,400	$318,300
Capital Repair / Replacement		3%		Percentage of direct capital cost	33,000		990	$4,300
SUBTOTAL COSTS							226,590	$983,000
CONTINGENCY	15.00%							$147,000
TOTAL O&M - SOURCE CONTROL								$1,130,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$1,445,000
TOTAL NET PRESENT VALUE OF REMEDY								$2,400,200

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre
CY - cubic yard
d - discount rate
EA - each
HR - hour
i - interest rate
LF - linear foot
LS - lump sum
MH - manhours
RD - round
SF - square foot
SY - square yard
UN - units

TABLE L-6 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - Asbestos Landfill

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
INSTITUTIONAL ACTIONS												
Access Restrictions												
Deed Restrictions												
Legal Fees and Investigation	MBTA, B&M Corp.	2	Lot	12.00	24	0.00	0	$150	3,600		0	$3,600
Fencing & Security Measures												
Security Fencing - 8' Chain Link	Perimeter on figure is 3952 ft	4,000	LF	0.16	640	16	64,000	$50.00	32,000	3.00	12,000	$108,000
Gates - Double Swing Door (20')		2	EA	22.00	44	1,200	2,400	$50.00	2,200	370.00	740	$5,340
Signage -- Warning: Hazardous Waste Area		1	LS	2.00	2	100.00	100	$50.00	100		0	$200
SUBTOTAL DIRECT COSTS					710		66,500		37,900		12,740	$117,140
CONTRACTOR OVERHEAD & PROFIT		21.00%										$24,599
SUBTOTAL												$141,739
CONTRACTOR'S CONTINGENCY		20.00%										$28,348
SUBTOTAL (rounded)												$170,000
BIDDING/DESIGN/CONSTRUCTION												$8,500
SUPERVISION												$25,500
EPA/MADEP OVERSIGHT												
TOTAL CAPITAL - SOURCE CONTROL												$204,000

TABLE L-6 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, overburden	5 clusters (clstr=1SOB, 1DOB, 1BR)	300	LF	0.30	90	6.00	1,800	$50.00	4,500	8.00	2,400	$8,700
Monitoring Well Installation, 2" PVC, bedrock	5 clusters (clstr=1SOB, 1DOB, 1BR)	300	LF	0.90	270	10.00	3,000	$50.00	13,500	24.00	7,200	$23,700
Mobilize/Demobilize drilling s/c	1 time	1	EA	16.00	16	0.00	0	$50.00	800	1,200.00	1,200	$2,000
Steel Casing & Locks	15 wells	15	EA	1.00	15	100.00	1,500	$50.00	750		0	$2,250
Protective Bollards	2 per well	30	EA	1.20	36	160.00	4,800	$50.00	1,800		0	$6,600
SUBTOTAL DIRECT COSTS					427		11,100		21,350		10,800	$43,250
CONTRACTOR OVERHEAD & PROFIT		21.00%										$9,083
SUBTOTAL												$52,333
CONTRACTOR'S CONTINGENCY		20.00%										$10,467
SUBTOTAL (rounded)												$63,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$3,150
EPA/MADEP OVERSIGHT												$9,450
TOTAL CAPITAL - MONITORING												$75,600
TOTAL CAPITAL												$279,600

Operation and Maintenance Costs for Remedy - Asbestos Landfill

DESCRIPTION	ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
INSTITUTIONAL ACTIONS							
n (years) = 30							
i (%) = 3							
d (%) = 7							
Access Restrictions							
Deed Restrictions (no O&M costs)							
Fencing & Security Measures							
Capital Repair / Replacement	1%		Percentage of direct capital cost	113,540		1,135	$19,000

TABLE L-6 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
Horizontal Containment								
Existing Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,000
General Maintenance		12.0	AC	Size of capped area	400	Putnam LF Closure/Post Closure Plan (Feb. 1998)	4,800	$82,000
SUBTOTAL COSTS							10,185	$173,000
CONTINGENCY	15.00%							$26,000
TOTAL O&M - SOURCE CONTROL								$199,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	16 locations	2	RD	Semi-annual monitoring	26,100	6 methods/groupings	52,200	$226,400
Field Sampling Costs	16 locations	2	RD	Semi-annual monitoring	25,100	6 methods/groupings	50,200	$217,700
Data Validation and Reporting	16 locations	2	RD	Semi-annual monitoring	31,300	6 methods/groupings	62,600	$271,500
Capital Repair / Replacement		3%		Percentage of direct capital cost	43,250		1,298	$5,600
SUBTOTAL COSTS							166,298	$721,000
CONTINGENCY	15.00%							$108,000
TOTAL O&M - SOURCE CONTROL								$829,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$1,028,000
TOTAL NET PRESENT VALUE OF REMEDY								$1,307,600

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre
CY - cubic yard
d - discount rate
EA - each
HR - hour
i - interest rate
LF - linear foot
LS - lump sum
MH - manhours
RD - round
SF - square foot
SY - square yard
UN - units

TABLE L-7 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Capital Costs for Remedy - Asbestos Lagoons

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
SOURCE CONTROL												
Horizontal Containment												
Single Barrier Cap												
Site Preparation	Clearing and grubbing - very light effort	2.8	AC	48.00	132	0.00	0	$50.00	6,600	1,150.00	3,163	$9,763
Erosion Control	Haybale/silt fence perimeter	2,025	LF	0.05	101	1.75	3,544	$50.00	5,063		0	$8,606
Dust Control	During initial grading - maybe level C	1	LS	160.00	160	0.00	0	$50.00	8,000	14,000	14,000	$22,000
Excavation and Grading	Grade berms for sloping - maybe level C	2,700	CY	0.10	270	0.00	0	$50.00	13,500	1.41	3,807	$17,307
Soil Subgrade	Granular fill <1.5 inches, 5 lifts likely for slope	21,385	CY	0.10	2,139	12.00	256,620	$50.00	106,925	2.00	42,770	$406,315
Geotextile	Typical, 12 oz.	13,333	SY	0.01	133	1.35	18,000	$50.00	6,667	0.05	667	$25,333
Low Density PE Geomembrane - 60 mil	60 mil LDPE	120,000	SF	0.012	1,440	0.42	50,400	$50.00	72,000	0.05	6,000	$128,400
Drainage Geocomposite	Typical	120,000	SF	0.009	1,080	0.40	48,000	$50.00	54,000	0.05	6,000	$108,000
Cover Soil	Soil/gravel mix, 24"	11,150	CY	0.12	1,338	12.00	133,800	$50.00	66,900	1.65	18,398	$219,098
Topsoil	Loam/soil mix, 6"	2,800	CY	0.12	336	15.00	42,000	$50.00	16,800	1.65	4,620	$63,420
Toe Drain stone	3/4-inch washed stone	52	CY	0.15	8	18.00	936	$50.00	390	2.00	104	$1,430
Drainage Pipe, 6" PVC, perforated	6" PVC perforated pipe with Toe Drain	1,400	LF	0.16	224	2.66	3,724	$50.00	11,200		0	$14,924
Geotextile	Use for toe drains and swales, 12 oz.	1,920	SY	0.01	19	1.35	2,592	$50.00	960	0.05	96	$3,648
Hydroseed	Lawn mix, no clover	2.9	AC	14.00	41	1,100	3,190	$50.00	2,030	330.00	957	$6,177
Drainage Swales	Riprap swales, 12' wide, 1' thick riprap	1,400	LF	0.10	140	0.00	0	$50.00	7,000	1.60	2,240	$9,240
Rip-Rap	For drainage swales	625	CY	0.26	163	16.00	10,000	$50.00	8,125	8.00	5,000	$23,125
Crushed stone	6" layer, 4' width along swales	105	CY	0.15	16	15.00	1,575	$50.00	788	2.00	210	$2,573
Detention Basins	Use 2 basins, 75' x 75' x 4' depth	1,670	CY	0.10	167	0.00	0	$50.00	8,350	1.41	2,355	$10,705
Piezometer Installation, 1" Sch. 80 PVC	4 @ 40ft deep	160	LF	0.30	48	6.00	960	$50.00	2,400	8.00	1,280	$4,640
Piezometer Wellheads - Corrugated HDPE Covers	4 piezometers	4	EA	1.00	4	100.00	400	$50.00	200		0	$600
Security Fencing - 8' Chain Link	Perimeter, top rail and bottom tension wire	1,800	LF	0.16	288	16.00	28,800	$50.00	14,400	3.00	5,400	$48,600
Gates - Double Swing Door (20')		2	EA	22.00	44	1,200	2,400	$50.00	2,200	370.00	740	$5,340
Signage -- Warning: Hazardous Waste Area		1	LS	2.00	2	100.00	100	$50.00	100		0	$200

TABLE L-7 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

DESCRIPTION	BASIS	QUAN-TITY	UN	MANHOURS MH/ UNIT	MANHOURS TOTAL MH	MATERIAL UNIT COST	MATERIAL TOTAL MATL	LABOR WAGE RATE	LABOR TOTAL LABOR	EQUIPMENT UNIT RATE	EQUIPMENT TOTAL EQUIP	TOTAL DIRECT COST
SUBTOTAL DIRECT COSTS					8,292		607,041		414,597		117,805	$1,139,443
CONTRACTOR OVERHEAD & PROFIT		21.00%										$239,283
SUBTOTAL												$1,378,726
CONTRACTOR'S CONTINGENCY		20.00%										$275,745
SUBTOTAL (rounded)												$1,654,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$279,933
EPA/MADEP OVERSIGHT												$211,767
TOTAL CAPITAL - SOURCE CONTROL												$2,145,700
Monitoring												
Groundwater Monitoring												
Monitoring Well Installation, 2" PVC, overburden	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.30	72	6.00	1,440	$50.00	3,600	8.00	1,920	$6,960
Monitoring Well Installation, 2" PVC, bedrock	4 clusters (clstr=1SOB, 1DOB, 1BR)	240	LF	0.90	216	10.00	2,400	$50.00	10,800	24.00	5,760	$18,960
Mobilize/Demobilize Drilling S/C	1 time	1	EA	16.00	16	0.00	0	$50.00	800	1,200.00	1,200	$2,000
Steel Casing & Locks	12 wells	12	EA	1.00	12	100.00	1,200	$50.00	600		0	$1,800
Protective Bollards	2 per well	24	EA	1.20	29	160.00	3,840	$50.00	1,440		0	$5,280
SUBTOTAL DIRECT COSTS					345		8,880		17,240		8,880	$35,000
CONTRACTOR OVERHEAD & PROFIT		21.00%										$7,350
SUBTOTAL												$42,350
CONTRACTOR'S CONTINGENCY		20.00%										$8,470
SUBTOTAL (rounded)												$51,000
BIDDING/DESIGN/CONSTRUCTION SUPERVISION												$2,550
EPA/MADEP OVERSIGHT												$7,650
TOTAL CAPITAL - MONITORING												$61,200
TOTAL CAPITAL												$2,206,900

TABLE L-7 COST ESTIMATE SUMMARY FOR THE SELECTED REMEDY

Operation and Maintenance Costs for Remedy - Asbestos Lagoons

DESCRIPTION		ANNUAL QUAN-TITY	UN	QUANTITY BASIS	UNIT COST	COST BASIS	ANNUAL COST ($/YEAR)	NPV
SOURCE CONTROL								
n (years) = 30								
i (%) = 3								
d (%) = 7								
Horizontal Containment								
Single Barrier Cap								
Labor								
	Specialist (eng., specialty reps)	50	HR	5 specialist-days per year @ 10 hrs/day	85.00		4,250	$72,000
General Maintenance		2.8	AC	Size of area to be capped	400	Putnam LF Closure/Post Closure Plan (Feb. 1998)	1,100	$19,000
SUBTOTAL COSTS							5,350	$91,000
CONTINGENCY	15.00%							$14,000
TOTAL O&M - SOURCE CONTROL								$105,000
Monitoring								
n (years) = 5								
i (%) = 3								
d (%) = 7								
Groundwater Monitoring								
Laboratory Analytical Costs	13 locations	2	RD	Semi-annual monitoring	18,100	6 methods/groupings	36,200	$157,000
Field Sampling Costs	13 locations	2	RD	Semi-annual monitoring	21,000	6 methods/groupings	42,000	$182,100
Data Validation and Reporting	13 locations	2	RD	Semi-annual monitoring	18,700	6 methods/groupings	37,400	$162,200
Capital Repair / Replacement		3%		Percentage of direct capital cost	35,000		1,050	$4,600
SUBTOTAL COSTS							116,650	$506,000
CONTINGENCY	15.00%							$76,000
TOTAL O&M - SOURCE CONTROL								$582,000
TOTAL OPERATIONS & MAINTENANCE NET PRESENT VALUE								$687,000
TOTAL NET PRESENT VALUE OF REMEDY								$2,893,900

Notes

Cost estimates may be refined when remedy is designed and are within +50 to -30% accuracy expectation.

AC - acre
CY - cubic yard
d - discount rate
EA - each
HR - hour
i - interest rate
LF - linear foot
LS - lump sum
MH - manhours
RD - round
SF - square foot
SY - square yard
UN - units

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
No Action					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by exposure to contaminants not addressed.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants not addressed.
	Location Specific	NO			
	Action Specific	NO			

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Limited Action: Institutional Controls					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. § 1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near wetland and floodplain areas. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.
	Federal Regulatory Requirements	Executive Order 11988; "Floodplain Management" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a 100-year floodplain. Action to avoid, whenever possible, the long- and short-term impacts associated with the occupancy and modifications of floodplains development, wherever there is a practical alternative. Promotes the preservation and restoration of floodplains so that their natural and beneficial value can be realized.	If new monitoring wells are needed, and no practical alternative to locating them in floodplain, then measures will be taken to minimize impacts.
	Federal Regulatory Requirements	National Historic Preservation Act of 1966 (16 U.S.C. §470 et seq.); Protection of Historic Properties (36 CFR part 800)	Applicable	This alternative includes work near the historic Middlesex Canal. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Advisory Council on Historic Preservation.
	Federal Regulatory Requirements	Historic Sites Act of 1935 (16 U.S.C. §469 *et seq.*); National historic landmarks (36 CFR Part 65)	Applicable	This alternative includes work near the historic Middlesex Canal. The purpose of the National Historic Landmarks program is to identify and designate National Historic Landmarks, and encourage the long range preservation of nationally significant properties that illustrate or commemorate the history and prehistory of the United States.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Department of the Interior.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.
	Massachusetts Regulatory Requirements	Antiquities Act and Regulations (Mass. Gen. Laws. ch. 9, §§26-27; Massachusetts Historical Commission (Mass. Regs. Code tit. 950, §70.00); Antiquities Act and Regulations (Mass.Gen.Laws. ch. 9, §§26-27; Protection of Properties Included in the State Register of Historic Places (950 CMR §71.00).	Relevant and Appropriate	This alternative includes work near the historic Middlesex Canal. Projects which are state-funded or state-licensed or which are on state property must eliminate, minimize, or mitigate adverse effects to properties listed in the register of historic places. Establishes requirements for review of impacts for state-funded or state-licensed projects and projects on state-owned property. Establishes state register of historic places. Establishes coordination with the National Historic Preservation Act.	Should this alternative impact the historical, architectural, archaeological, or cultural qualities of a property, whether listed or not, activities will be coordinated with the Massachusetts Historical Commission.
	Action Specific	YES			

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements, Closure and Post-Closure (40 CFR Parts 260-262 and 264)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. However this Alternative will not be meet the closure/post closure standards because institutional controls alone will not address requirements to prevent ecological risks nor prevent migration of contaminants to surface and groundwater.
	Federal Regulatory Requirements	EPA Alternative Cap Guidance	To be Considered	Provides standards for alternative cap design to address risks from wastes left in place from human exposure, ecological risk, and migration to surface and groundwater.	These standards will not be met because institutional controls alone will not address requirements to prevent ecological risks nor prevent migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); - Waste Analysis (310 CMR 30.513), Closure (310 CMR 30.580), Post-Closure (310 CMR 30.590), Landfill Closure (310 CMR 30.633)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	Because of the past disposal of wastes at AOC #1 that would be considered hazardous wastes by today's standards, all remedial actions must be in conformance with these rules. Waste analysis, closure and post-closure performance standards are spelled out. A final cover will be designed and constructed to provide long-term minimization of migration of liquids. After final closure, maintenance and monitoring will be conducted throughout the post-closure care period.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. However this Alternative will not be meet the closure/post closure standards because institutional controls alone will not address requirements to prevent ecological risks nor prevent migration of contaminants to surface and groundwater.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes remediation activities in wetlands and buffer zones. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Any discharges from well installation or monitoring will be managed in compliance with these standards.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Monitored Natural Attenuation (in-situ)					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. §1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be completed in a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near wetland and floodplain areas. 'Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.
	Federal Regulatory Requirements	Executive Order 11988; "Floodplain Management" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a 100-year floodplain. Action to avoid, whenever possible, the long- and short-term impacts associated with the occupancy and modifications of floodplains development, wherever there is a practical alternative. Promotes the preservation and restoration of floodplains so that their natural and beneficial value can be realized.	A determination has been made that there is no practical alternative to these construction activities in the floodplain. Remedial actions that involve construction in the floodplain will include all practicable means to minimize harm to and preserve beneficial values of floodplains.
	Federal Regulatory Requirements	National Historic Preservation Act of 1966 (16 U.S.C. §470 et seq.); Protection of Historic Properties (36 CFR part 800)	Applicable	This alternative includes work near the historic Middlesex Canal. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Advisory Council on Historic Preservation.
	Federal Regulatory Requirements	Historic Sites Act of 1935 (16 U.S.C. §469 *et seq.*); National historic landmarks (36 CFR Part 65)	Applicable	This alternative includes work near the historic Middlesex Canal. The purpose of the National Historic Landmarks program is to identify and designate National Historic Landmarks, and encourage the long range preservation of nationally significant properties that illustrate or commemorate the history and prehistory of the United States.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Department of the Interior.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); *Wetlands Protection* Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zones, then measures will be taken to minimize impacts.
	Massachusetts Regulatory Requirements	Antiquities Act and Regulations (Mass. Gen. Laws. ch. 9, §§26-27; Massachusetts Historical Commission (Mass. Regs. Code tit. 950, §70.00); Antiquities Act and Regulations (Mass.Gen.Laws. ch. 9, §§26-27; Protection of Properties Included in the State Register of Historic Places (950 CMR §71.00)	Relevant and Appropriate	This alternative includes work near the historic Middlesex Canal. Projects which are state-funded or state-licensed or which are on state property must eliminate, minimize, or mitigate adverse effects to properties listed in the register of historic places. Establishes requirements for review of impacts for state-funded or state-licensed projects and projects on state-owned property. Establishes state register of historic places. Establishes coordination with the national Historic Preservation Act.	Should this alternative impact the historical, architectural, archaeological, or cultural qualities of a property, whether listed or not, activities will be coordinated with the Massachusetts Historical Commission.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements, Closure and Post-Closure (40 CFR Parts 260-262 and 264)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. However this Alternative will not be meet the standards for landfill closure.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	EPA Alternative Cap Guidance	To be Considered	Provides standards for alternative cap design to address risks from wastes left in place from human exposure, ecological risk, and migration to surface and groundwater.	This Alternative will not be meet the standards for landfill closure.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); - Waste Analysis (310 CMR 30.513), Closure (310 CMR 30.580), Post-Closure (310 CMR 30.590), Landfill Closure (310 CMR 30.633)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	Because of the past disposal of wastes at AOC #1 that would be considered hazardous wastes by today's standards, all remedial actions must be in conformance with these rules. Waste analysis, closure and post-closure performance standards are spelled out. A final cover will be designed and constructed to provide long-term minimization of migration of liquids. After final closure, maintenance and monitoring will be conducted throughout the post-closure care period.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. However this Alternative will not be meet the standards because natural attenuation alone will not meet the standards for landfill closure.
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes work to be performed in or near a wetland. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or buffer zones, then measure will be taken to minimize impacts.
Cap Waste	**Chemical Specific**	YES			
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by capping potential carcinogenic hazards and maintaining and monitoring the cap.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by capping potential non-carcinogenic hazards and maintaining and monitoring the cap.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. § 1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Given the location of contamination in wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. This alternative includes work to be completed in a defined wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Given the location of contamination in wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Resource Conservation and Recovery Act (42 U.S.C. §6901 *et seq*.); Location Standards (40 CFR §264.18)	Relevant and Appropriate	This alternative includes work to be performed in or near a 100-year floodplain. This regulation places limitations on where RCRA TSDFs may be located. It also outlines the criteria for constructing a RCRA facility on a 100-year floodplain.	A determination has been made that there is no practical alternative to these construction activities in the flood plain. Remedial actions that involve construction in the floodplain areas will include all practicable means to minimize harm to and preserve beneficial values of floodplains.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near defined wetland and floodplain areas. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Services and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Services should Remedial Activities involve the modification of a body of water.
	Federal Regulatory Requirements	Executive Order 11988; "Floodplain Management" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a 100-year floodplain. Action to avoid, whenever possible, the long and short-term impacts associated with the occupancy and modifications of floodplains development, wherever there is a practical alternative. Promotes the preservation and restoration of floodplains so that their natural and beneficial value can be realized.	A determination has been made that there is no practical alternative to these construction activities in the floodplain. Remedial actions that involve construction in the floodplain areas will include all practicable means to minimize harm to and preserve beneficial values of floodplains.
	Federal Regulatory Requirements	National Historic Preservation Act of 1966 (16 U.S.C. §470 et seq.); Protection of Historic Properties (36 CFR part 800)	Applicable	This alternative includes work near the historic Middlesex Canal. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Advisory Council on Historic Preservation.
	Federal Regulatory Requirements	Historic Sites Act of 1935 (16 U.S.C. §469 *et seq.*); National historic landmarks (36 CFR Part 65)	Applicable	This alternative includes work near the historic Middlesex Canal. The purpose of the National Historic Landmarks program is to identify and designate National Historic Landmarks, and encourage the long range preservation of nationally significant properties that illustrate or commemorate the history and prehistory of the United States.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Department of the Interior.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Substantive standards for protecting State wetland resources will be complied with. Mitigation of impacts on wetlands and regulated buffer zones will be addressed.
	Massachusetts Regulatory Requirements	Antiquities Act and Regulations (Mass. Gen. Laws. ch. 9, §§26-27; Massachusetts Historical Commission (Mass. Regs. Code tit. 950, §70.00); Antiquities Act and Regulations (Mass.Gen.Laws. ch. 9, §§26-27; Protection of Properties Included in the State Register of Historic Places (950 CMR §71.00)	Relevant and Appropriate	This alternative includes work near the historic Middlesex Canal. Projects which are state-funded or state-licensed or which are on state property must eliminate, minimize, or mitigate adverse effects to properties listed in the register of historic places. Establishes requirements for review of impacts for state-funded or state-licensed projects and projects on state-owned property. Establishes state register of historic places. Establishes coordination with the national Historic Preservation Act.	Should this alternative impact the historical, architectural, archaeological, or cultural qualities of a property, whether listed or not, activities will be coordinated with the Massachusetts Historical Commission.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements, Closure and Post-Closure (40 CFR Parts 260-262 and 264)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. This Alternative will meet the closure/post closure standards through capping, monitoring and institutional controls.

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	EPA Alternative Cap Guidance	To be Considered	Provides standards for alternative cap design to address risks from wastes left in place from human exposure, ecological risk, and migration to surface and groundwater.	These standards will be met because because the alternative cap design will prevent risks to human health and the environment and prevent migration of contaminants to surface and groundwater.
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimized.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); - Waste Analysis (310 CMR 30.513), Closure (310 CMR 30.580), Post-Closure (310 CMR 30.590), Landfill Closure (310 CMR 30.633)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	Because of the past disposal of wastes at AOC #1 that would be considered hazardous wastes by today's standards, all remedial actions must be in conformance with these rules. Waste analysis, closure and post-closure performance standards are spelled out. A final cover will be designed and constructed to provide long-term minimization of migration of liquids. After final closure, maintenance and monitoring will be conducted throughout the post-closure care period.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. This Alternative will meet all closure/post closure standards.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Contingency Plan, Emergency Procedures, Preparedness, and Prevention (310 CMR 30.520)	Relevant and Appropriate	This area is being closed in accordance with hazardous waste requriements. Includes requriements for contingency plan, emergency procedures, preaparedness and prevention.	This requirement will be met for this alternative

TABLE L-8. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M RAILROAD LANDFILL

Alternative	Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes remediation activities in wetlands and buffer zones. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Activities will be conducted in accordance with these requriements to protect State wetland resources.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.

TABLE L-9. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE RSI LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
No Action					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by exposure to contaminants not addressed.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants not addressed.
	Location Specific	NO			
	Action Specific	NO			

TABLE L-9. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE RSI LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Cap Waste					
	Chemical Specific	YES			
	Federal Regulatory Requirements	*Cancer Slope Factors (CSF).*	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by capping potential carcinogenic hazards and maintaining and monitoring the cap.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by capping potential non-carcinogenic hazards and maintaining and monitoring the cap.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. §1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Given the location of contamination in wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Given the location of contamination in wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.

TABLE L-9. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE RSI LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Substantive standards for protecting State wetland resources will be complied with. Mitigation of impacts on wetlands and regulated buffer zones will be addressed.
	Federal Regulatory Requirements	National Historic Preservation Act of 1966 (16 U.S.C. §470 et seq.); Protection of Historic Properties (36 CFR part 800)	Applicable	This work includes work to be performed near the historic Middlesex Canal. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Advisory Council on Historic Preservation.
	Federal Regulatory Requirements	Historic Sites Act of 1935 (16 U.S.C. §469 *et seq.*); National historic landmarks (36 CFR Part 65)	Applicable	This alternative includes work to be performed near the historic Middlesex Canal. The purpose of the National Historic Landmarks program is to identify and designate National Historic Landmarks, and encourage the long range preservation of nationally significant properties that illustrate or commemorate the history and prehistory of the United States.	Should this alternative impact historical properties (such as the Middlesex Canal), activities will be coordinated with the Department of the Interior.

TABLE L-9. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE RSI LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Antiquities Act and Regulations (Mass. Gen. Laws. ch. 9, §§26-27; Massachusetts Historical Commission (Mass. Regs. Code tit. 950, §70.00); Antiquities Act and Regulations (Mass.Gen.Laws. ch. 9, §§26-27; Protection of Properties Included in the State Register of Historic Places (950 CMR §71.00)	Relevant and Appropriate	This alternative includes work to be performed near the historic Middlesex Canal. Projects which are state-funded or state-licensed or which are on state property must eliminate, minimize, or mitigate adverse effects to properties listed in the register of historic places. Establishes requirements for review of impacts for state-funded or state-licensed projects and projects on state-owned property. Establishes state register of historic places. Establishes coordination with the national Historic Preservation Act.	Should this alternative impact the historical, architectural, archaeological, or cultural qualities of a property, whether listed or not, activities will be coordinated with the Massachusetts Historical Commission.
	Action Specific	YES			
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimized.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will be meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	This Alternative will be meet the landfill design standards to prevent human contact and migration of contaminants to surface and groundwater.

TABLE L-9. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE RSI LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes work to be performed in or near a wetland. Establishes *criteria and standards for dredging, handling* and disposal of fill material and dredged material.	Activities will be conducted in accordance with these requriements to protect State wetland resources.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in *310 CMR 7.09.*	These standards will be complied with during any excavation of materials at the Site.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
No Action					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard not met since alternative does not address lead soil risks.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by exposure to contaminants not addressed.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants not addressed.
	Location Specific	No			
	Action Specific	No			

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Limited Action: Institutional Controls					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by preventing human access to lead contaminated soil.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. §1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zone, then measures will be taken to minimize impacts.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimized.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not be meet the closure/post closure standards because institutional controls alone will not address requirements to protect ecological receptors and prevent migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	Waste analysis performance standards are spelled out.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address landfill design standards.
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	Establishes criteria and standards for discharging into wetlands and surface waters	If new monitoring wells are needed, any discharges from well installation or maintenance will meet these standards

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Monitored Natural Attenuation (in-situ)					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by preventing human access to lead contaminated soil through institutional controls as part of the remedy.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time. Potential carcinogenic hazards caused by exposure to contaminants would be addressed through institutional controls.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time. Potential carcinogenic hazards caused by exposure to contaminants would be addressed through institutional controls.
	Location Specific	YES			

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. §1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	If new monitoring wells are needed, and no practical alternative to locating in wetlands, then measures will be taken to minimize impacts.
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed in or near a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zones, then measures will be taken to minimize impacts.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimzed.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not be meet the closure/post closure standards because it will not address requirements to protect ecological receptors and prevent migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	Waste analysis performance standards are spelled out.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address standards for landfill design.
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	Establishes criteria and standards for discharging into wetlands and surface waters	If new monitoring wells are needed, any discharges from well installation or maintenance will meet these standards

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Excavate and Place Under Another On-Site AOC Cap					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by removing lead contaminated soil and placing it under a cap.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by removing potential carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by removing potential non-carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. §1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Adverse impacts will be minimized to the maximum extent practical.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Adverse impacts will be minimized to the maximum extent practical.
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near a wetland. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed in or near a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to wetlands and regulated buffer zones will be minimized to the maximum extent practical.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimzed.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of excavation activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will be meet the closure/post closure standards to prevent human contact, ecological risk, and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes work to be performed in or near a wetland. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Activities will be conducted in accordance with these requriements to protect State wetland resources.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Excavate & Treat On-Site: solidification & stabilization					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. § 1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Adverse impacts will be minimized to the maximum extent practical.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be perfomed in or near a wetland. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	Adverse impacts will be minimized to the maximum extent practical.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Adverse impacts will be minimized to the maximum extent practical.
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to wetlands and regulated buffer zones will be minimized to the maximum extent practical.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimzed.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact, ecological risk, and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	This alternative includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes remediation activities in wetlands and buffer zones. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Adverse impacts will be minimized to the maximum extent practical to protect State wetland resources.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Excavate & Treat On-Site: soil washing & chemical extraction					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. § 1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Adverse impacts will be minimized to the maximum extent practical.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near a wetland. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Adverse impacts will be minimized to the maximum extent practical.
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to wetlands and regulated buffer zones will be minimized to the maximum extent practical.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimzed.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact, ecological risk, and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Hazardous Waste Management - Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	This alternative includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes remediation activities in wetlands and buffer zones. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Adverse impacts will be minimized to the maximum extent practical to protect State wetland resources.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be met during any excavation of materials.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Cap Waste					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by capping soil and maintaining institutional controls to eliminate lead risk.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by capping potential carcinogenic hazards and maintaining and monitoring the cap.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by capping potential non-carcinogenic hazards and maintaining and monitoring the cap.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. § 1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	Applicable	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Given the location of contamination on the edge of wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be completed in a defined wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Given the location of contamination on the edge of wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources will be minimized to the maximum extent practical and mitigation conducted if required.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near a wetland. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Substantive standards for protecting State wetland resources will be complied with. Mitigation of impacts on wetlands and regulated buffer zones will be addressed.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Federal Regulatory Requirements	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	This provision sets standards for protecting surface water quality.	Activities will be conducted to ensure that the impact of site-related contaminants to surface water will be minimized.

TABLE L-10. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE B&M LOCOMOTIVE SHOP DISPOSAL AREAS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will be meet the closure/post closure standards to prevent human contact, ecological risk, and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	This Alternative will be meet the landfill design standards to prevent human contact, ecological risk, and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes work to be performed in or near a wetland. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Activities will be conducted in accordance with these requriements to protect State wetland resources.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
No Action					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard not met since alternative does not address lead soil risks.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by exposure to contaminants not addressed.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants not addressed.
	Location Specific	NO			
	Action Specific	NO			

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Limited Action: Institutional Controls					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met through preventing human access to lead contaminated soil.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zone, then measures will be taken to minimize impacts.
	Action Specific	YES			

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	Waste analysis performance standards are spelled out.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not meet the closure/post closure standards because institutional controls alone will not address requirements to prevent migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address landfill design standards.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Monitored Natural Attenuation (in-situ)					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by preventing human access to lead contaminated soil through institutional controls as part of the remedy.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time. Potential carcinogenic hazards caused by exposure to contaminants would be addressed through institutional controls.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time. Potential carcinogenic hazards caused by exposure to contaminants would be addressed through institutional controls.
	Location Specific	YES			

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zone, then measures will be taken to minimize impacts.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not be meet the closure/post closure standards.
	Massachusetts Regulatory Requirements	Hazardous Waste Management Regulations (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	Waste analysis performance standards are spelled out.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address standards for landfill design.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Excavate and Place Under Another On-Site AOC Cap					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by removing lead contaminated soil and placing it under a cap at another AOC.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by removing potential carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by removing potential non-carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed in or near a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
	Action Specific	YES			

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of excavation activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will be meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials.
Excavate & Treat On-Site: solidification & stabilization					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Hazardous Waste Management - Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	This alternative includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials.
Excavate & Treat On-Site: soil washing & chemical extraction					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Hazardous Waste Management - Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	This alternative includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials.
Cap Waste					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by capping soil and maintaining institutional controls to eliminate lead risk.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by capping potential carcinogenic hazards and maintaining and monitoring the cap.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by capping potential non-carcinogenic hazards and maintaining and monitoring the cap.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
	Action Specific	YES			
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.

TABLE L-11. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE OLD B&M OIL/SLUDGE RECYCLING AREA

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	This Alternative will be meet the landfill design standards to prevent human contact and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Applicable	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Chemical Specific	YES			
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard not met since alternative does not address lead soil risks.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by exposure to contaminants not addressed.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants not addressed.
Location Specific	NO			
Action Specific	NO			
Chemical Specific	YES			
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met through preventing human access to lead contaminated soil.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
Location Specific	YES			
Action Specific	YES			
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not meet the closure/post closure standards because institutional controls alone will not address requirements to prevent migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address landfill design standards.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Chemical Specific	YES			
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by preventing human access to lead contaminated soil through institutional controls as part of the remedy.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time. Potential carcinogenic hazards caused by exposure to contaminants would be addressed through institutional controls.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative might meet this standard if potential carcinogenic hazards caused by migration of contaminants into groundwater are naturally attenuated over time. Potential carcinogenic hazards caused by exposure to contaminants would be addressed through institutional controls.
Location Specific	YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zone, then measures will be taken to minimize impacts.
Action Specific	YES			
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not be meet the closure/post closure standards.
Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address standards for landfill design.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Chemical Specific	YES			
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
Location Specific	YES			
Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
Action Specific	YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510); Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste. This alternative also includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Chemical Specific	YES			
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
Location Specific	YES			
Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
Action Specific	YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510); Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste. This alternative also includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Chemical Specific	YES			
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by capping soil and maintaining institutional controls to eliminate lead risk.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by capping potential carcinogenic hazards and maintaining and monitoring the cap.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by capping potential non-carcinogenic hazards and maintaining and monitoring the cap.
Location Specific	YES			
Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
Action Specific	YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will be meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	This Alternative will be meet the landfill design standards to prevent human contact and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.
Chemical Specific	~~NO~~ YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
Location Specific	YES			
Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
Action Specific	YES			
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 *CMR 510); Storage and* Treatment in Tanks (310 CMR 30.690)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste. This alternative also includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post *closure standards to prevent human contact* and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.
Chemical Specific	~~NO~~ YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by treating soil to eliminate lead risk.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	Standard will be met by treating soil to eliminate risks from carcinogenic contaminants.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	Standard will be met by treating soil to eliminate risks from non-carcinogenic contaminants.
Location Specific	YES			
Massachusetts Regulatory Requirements	Massachusetts Endangered Species Act (Mass. Gen. Laws ch. 131, §40); Massachusetts Endangered Species Act Regulations, Part III: Alteration of Significant Habitat (321 CMR §§10.30-10.43)	Applicable	The MESA establishes state's list of threatened and endangered species and species of special concern. Habitat of such species is protected by the regulations promulgated under the MA Wetlands Protection Act.	Should this alternative alter this habitat, it will comply with the substantive requirements of these regulations.
Action Specific	YES			
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Federal Regulatory Requirements	RCRA Subtitle D (40 U.S.C. § 6901)	Applicable	These standards govern the disposal of non-hazardous waste.	This Alternative meets the closure/post closure standards by treating the waste so that it no longer poses a risk

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510); Storage and Treatment in Tanks (310 CMR 30.690)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste. This alternative also includes treatment of wastes in tanks. Specifies requirements for tank systems used to store or treat hazardous wastes in tanks. Provides specifications for design and installation of tank systems. Requires secondary containment, leak detection systems, and inspections. Identifies general operating requirements, and closure and post-closure care.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards. Design and installation requirements will be followed for any on-site treatment of hazardous wastes in tanks. Since the classification of wastes has not been established as characteristic hazardous waste, the need for compliance with these regulations will be determined after sampling and analysis of each media to be treated or handled. Specifications will include secondary containment, if necessary.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.
Chemical Specific	YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposured to Lead in Soil	To be Considered	EPA guidance for evaluating the risks posed by lead in soil.	Standard will be met by removing contaminated soil and disposing off-site.
Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by removing potential carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by removing potential non-carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
Location Specific	YES			
Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	Adverse impacts to regulated wetland buffer zones will be minimized to the maximum extent practical.
Action Specific	YES			

LE L-12. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE CONTAMINATED SOILS AREA

ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of treatment activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste. Identifies general operating requirements, and closure and post-closure care.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address disposal of non-hazardous waste and closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of treatment activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.09)	Relevant and Appropriate	This alternative includes excavation and/or earthwork. Prohibits burning or emissions of dust which causes or contributes to a condition of air pollution. Standards for dust are contained in 310 CMR 7.09.	These standards will be complied with during any excavation of materials at the Site.

TABLE L-13. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
No Action					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups	To be Considered	EPA guidance on developing cleanup goals for asbestos.	The long-term risks from asbestos will not be addressed since the landfill cap will not be maintained.
	Location Specific	NO			
	Action Specific	NO			

TABLE L-13. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Limited Action: Institutional Controls					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups	To be Considered	EPA guidance on developing cleanup goals for asbestos.	This alternative will meet this standard since risks from asbestos will be addressed by maintaining the existing cap and preventing access to the Site.
	Location Specific	YES			
	Federal Regulatory Requirements	Clean Water Act (33 U.S.C. §1251 *et seq*.); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230, 231 and 33 CFR Parts 320-323)	40 CFR 230, 231 are Applicable; 33 CFR 320-323 are Relevant and Appropriate	This alternative includes work to be performed in or near a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Given the location of contamination on the edge of wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources from cap maintenance, fencing and well installation activitiy will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Executive Order 11990; "Protection of Wetlands" (40 CFR Part 6, Appendix A)	Applicable	This alternative includes work to be completed in a wetland. Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. If activity takes place, impacts must be minimized to the maximum extent.	Given the location of contamination on the edge of wetlands, this Alternative has been determined to be the best practical alternative. Adverse impacts to wetland resources from cap maintenance, fencing and well installation activitiy will be minimized to the maximum extent practical and mitigation conducted if required.
	Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. §661 et seq.); Fish and wildlife protection (40 CFR §6.302(g))	Applicable	This alternative includes work to be performed in or near wetland and floodplain areas. Any modification of a body of water requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate or compensate for losses of fish and wildlife.	EPA will consult with U.S. Fish and Wildlife Service should Remedial Activities involve the modification of a body of water.

TABLE L-13. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed in or near a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zones and/or fencing needs to be constructed in wetland and/or regulated buffer zone, then measures will be taken to minimize impacts.

TABLE L-13. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Action Specific	YES			
	Federal Regulatory Requirements	Clean Air Act - National Emission Standard for Asbestos, Subpart M (40 CFR Part 61.150, 61.151)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for packaging, transport and disposal of materials that contain asbestos. Disposal requirements for asbestos disposal sites are established. Advance EPA notification of the intended disposal site is required.	These standards will be complied with for any asbestos-containing materials handled/disposed of at the Site. Furthermore, maintenance and monitoring of the cap will meet these standards.
	Federal Regulatory Requirements	Toxic Substances Control Act - Transport and Disposal of Asbestos Waste (40 CFR 763, Subpart E, Appendix D)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for transport and disposal of materials that contain asbestos. Requires proper wetting and containerization. Disposal involves the isolation of asbestos material to prevent fiber release. Landfilling is recommended. Final cover of an area containing asbestos waste is at least 30 inches of nonasbestos material to provide a 36-inch final cover. Signs warning "Breathing Asbestos Dust May Cause Lung Disease and Cancer" should be displayed.	These standards will be complied with for any asbestos-containing materials handled/disposed of at the Site. Furthermore, maintenance and monitoring of the cap will meet these standards.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.15)	Relevant and Appropriate	This alternative includes excavation and/or earthwork of asbestos-contaminated areas. Provides standards for demolition and renovation of facilities or facility components that contain asbestos. Requires notice to the DEP of work to be done. Specifies procedures to prevent and control asbestos emissions. Identifies waste disposal requirements.	These standards will be complied with as relevant and appropriate to any disturbance of asbestos-containing materials handled/disposed of at the Site.

TABLE L-13. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LANDFILL

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Clean Waters Act (Mass. Gen. Laws ch. 21, §§26-53); Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Materials in Waters of the United States within the Commonwealth (314 CMR §9.00)	Applicable	This alternative includes work to be performed in or near a wetland. Establishes criteria and standards for dredging, handling and disposal of fill material and dredged material.	Any discharges from well or fence installation or monitoring will be managed in compliance with these standards.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
No Action					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups	To be Considered	EPA guidance on developing cleanup goals for asbestos.	This alternative will not meet this standard since risks from asbestos not addressed.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by exposure to contaminants not addressed.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential non-carcinogenic hazards caused by exposure to contaminants not addressed.
	Location Specific	NO			
	Action Specific	NO			

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Limited Action: Institutional Controls					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups	To be Considered	EPA guidance on developing cleanup goals for asbestos.	This alternative will partially meet this standard since risks from asbestos will be reduced by preventing access to the Site. However, migration of asbestos from the Site will not be prevented.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will not meet this standard since potential carcinogenic hazards caused by migration of contaminants into groundwater will not be addressed through institutional controls.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed in or near a wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If new monitoring wells are needed, and no practical alternative to locating in wetlands or regulated buffer zones, then measures will be taken to minimize impacts.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Action Specific	YES			
	Federal Regulatory Requirements	Clean Air Act - National Emission Standard for Asbestos, Subpart M (40 CFR Part 61.150, 61.151)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for packaging, transport and disposal of materials that contain asbestos. Disposal requirements for asbestos disposal sites are established. Advance EPA notification of the intended disposal site is required.	These standards will not be met because institutional controls alone won't meet disposal requirements for leaving asbestos in the lagoons in place.
	Federal Regulatory Requirements	Toxic Substances Control Act - Transport and Disposal of Asbestos Waste (40 CFR 763, Subpart E, Appendix D)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for transport and disposal of materials that contain asbestos. Requires proper wetting and containerization. Disposal involves the isolation of asbestos material to prevent fiber release. Landfilling is recommended. Final cover of an area containing asbestos waste is at least 30 inches of nonasbestos material to provide a 36-inch final cover. Signs warning "Breathing Asbestos Dust May Cause Lung Disease and Cancer" should be displayed.	These standards will not be met because institutional controls alone won't meet disposal requirements for leaving asbestos in the lagoons in place.
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. However this Alternative will not meet the closure/post closure standards because institutional controls alone will not address requirements to prevent migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	These standards will not be met because institutional controls alone will not address landfill design requirements.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.15)	Relevant and Appropriate	This alternative includes excavation and/or earthwork of asbestos-contaminated areas. Provides standards for demolition and renovation of facilities or facility components that contain asbestos. Requires notice to the DEP of work to be done. Specifies procedures to prevent and control asbestos emissions. Identifies waste disposal requirements.	These standards will not be met because institutional controls alone won't meet disposal requirements for leaving asbestos in the lagoons in place.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Excavate and Place Under Another On-Site AOC Cap					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups	To be Considered	EPA guidance on developing cleanup goals for asbestos.	This alternative will meet this standard by removing asbestos and putting it under a cap at another AOC where it will be properly managed and monitored.
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by removing potential carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by removing potential non-carcinogenic hazards and putting it under a cap at another AOC where it will be properly managed and monitored.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a defined wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If excavation activities occur within regulated buffer zones, then measures will be taken to minimize impacts.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Action Specific	YES			
	Federal Regulatory Requirements	Clean Air Act - National Emission Standard for Asbestos, Subpart M (40 CFR Part 61.150, 61.151)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for packaging, transport and disposal of materials that contain asbestos. Disposal requirements for asbestos disposal sites are established. Advance EPA notification of the intended disposal site is required.	Excavation of asbestos contaminated material will be conducted in compliance with these standards.
	Federal Regulatory Requirements	Toxic Substances Control Act - Transport and Disposal of Asbestos Waste (40 CFR 763, Subpart E, Appendix D)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for transport and disposal of materials that contain asbestos. Requires proper wetting and containerization. Disposal involves the isolation of asbestos material to prevent fiber release. Landfilling is recommended. Final cover of an area containing asbestos waste is at least 30 inches of nonasbestos material to provide a 36-inch final cover. Signs warning "Breathing Asbestos Dust May Cause Lung Disease and Cancer" should be displayed.	Excavation of asbestos contaminated material will be conducted in compliance with these standards.
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500); Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of excavation activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.15)	Relevant and Appropriate	This alternative includes excavation and/or earthwork of asbestos-contaminated areas. Provides standards for demolition and renovation of facilities or facility components that contain asbestos. Requires notice to the DEP of work to be done. Specifies procedures to prevent and control asbestos emissions. Identifies waste disposal requirements.	These standards will be complied with as relevant and appropriate to any disturbance of asbestos-containing materials handled at the Site.
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of excavation activities that is determined to be non-hazardous would be managed and disposed of in accordance with these standards. This Alternative will meet the closure/post closure standards by removing all non-hazardous waste from the Site.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
Cap Waste					
	Chemical Specific	YES			
	Federal Regulatory Requirements	Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups	To be Considered	EPA guidance on developing cleanup goals for asbestos.	This alternative will meet this standard by capping the asbestos and maintaining and monitoring the cap
	Federal Regulatory Requirements	Cancer Slope Factors (CSF).	To Be Considered	Guidance used to compute the individual incremental cancer risk resulting from exposure to carcinogenic contaminants in site media.	This alternative will meet this standard by capping potential carcinogenic hazards and maintaining and monitoring the cap.
	Federal Regulatory Requirements	Reference Dose (RfD)	To Be Considered	Guidance used to characterize human health risks due to non-carcinogens in site media.	This alternative will meet this standard by capping potential non-carcinogenic hazards and maintaining and monitoring the cap.
	Location Specific	YES			
	Massachusetts Regulatory Requirements	Wetlands Protection Act (Mass. Gen. Laws ch. 131, §40); Wetlands Protection Regulations (310 CMR §10.00)	Applicable	This alternative includes work to be performed within 100 feet of a defined wetland. Sets performance standards for dredging, filling, altering of inland wetlands and within 100 feet of a wetland. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. Resource areas at the site covered by the regulations include banks, bordering vegetated wetlands, land under bodies of water, land subject to flooding, riverfront, and estimated habitats of rare wildlife.	If excavation and capping activities occur within regulated buffer zones, then measures will be taken to minimize impacts.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Action Specific	YES			
	Federal Regulatory Requirements	Clean Air Act - National Emission Standard for Asbestos, Subpart M (40 CFR Part 61.150, 61.151)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for packaging, transport and disposal of materials that contain asbestos. Disposal requirements for asbestos disposal sites are established. Advance EPA notification of the intended disposal site is required.	These standards for managing asbestos and capping the area will be met.
	Federal Regulatory Requirements	Toxic Substances Control Act - Transport and Disposal of Asbestos Waste (40 CFR 763, Subpart E, Appendix D)	Applicable	This alternative includes remedial actions of areas containing asbestos. Provides standards for transport and disposal of materials that contain asbestos. Requires proper wetting and containerization. Disposal involves the isolation of asbestos material to prevent fiber release. Landfilling is recommended. Final cover of an area containing asbestos waste is at least 30 inches of nonasbestos material to provide a 36-inch final cover. Signs warning "Breathing Asbestos Dust May Cause Lung Disease and Cancer" should be displayed.	These standards for managing asbestos and capping the area will be met.
	Federal Regulatory Requirements	RCRA Subtitle C- Hazardous Waste Identification and Listing Regulations; Generator and Handler Requirements (40 CFR Parts 260-262 and 264)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.
	Massachusetts Regulatory Requirements	Management Standards for all Hazardous Waste Facilities (310 CMR 30.500), Waste Analysis (310 CMR 30.513); Management Standards (310 CMR 510)	Applicable	These rules are used to identify, manage, and dispose of hazardous waste.	Any media generated as part of monitoring activities will be tested for hazardous waste characteristics. If determined to be hazardous waste, then they will be stored, transported, and disposed off site in accordance with these standards.

TABLE L-14. ARARS, CRITERIA, ADVISORIES, AND GUIDANCE FOR THE ASBESTOS LAGOONS

Alternative	ARAR, Media and Authority	Requirements	Status	Triggering Action & Requirement Synopsis	Action to be taken to attain ARAR
	Massachusetts Regulatory Requirements	Mass Solid Waste Management Regulations (310 CMR 19.00)	Applicable for disposal standards; Relevant and Appropriate for Closure/Post Closure Standards	These regulations address management and disposal of non-hazardous waste, closure, post-closure, and maintenance of solid waste landfills.	Any media generated as part of monitoring activities that is determined to be non-hazardous would be managed and disposed off site in accordance with these standards. This Alternative will be meet the closure/post closure standards to prevent human contact and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Massachusetts DEP Landfill Technical Guidance Manual	To be Considered	Provides a standard reference for and guidance on landfill design, construction and QA/QC procedures in accordance with 310 CMR 19.00	This Alternative will be meet the landfill design standards to prevent human contact and migration of contaminants to surface and groundwater.
	Massachusetts Regulatory Requirements	Massachusetts Air Pollution Control Regulations (310 CMR 7.15)	Relevant and Appropriate	This alternative includes excavation and/or earthwork of asbestos-contaminated areas. Provides standards for demolition and renovation of facilities or facility components that contain asbestos. Requires notice to the DEP of work to be done. Specifies procedures to prevent and control asbestos emissions. Identifies waste disposal requirements.	These standards will be complied with as relevant and appropriate to any disturbance of asbestos-containing materials handled at the Site.