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TABLE 2-7
SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
No Action	No Action	Not Applicable	No Action	Retained. Used as baseline for comparison with other options as required by NCP. Low cost.	Common Approach
Limited Action	Institutional Controls	Deed Restrictions	Administrative action used to restrict future site activities on individual properties. Restrictions would prevent activities such as excavation or residential development.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
		Local Ordinances	Administrative action used to limit property use and activities such as well installation.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
	Access Restrictions	Fencing	Barrier erected to restrict access to contaminated properties.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
		Post Signs	Post "No Trespassing" or hazard warning signs.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
	Long-Term Monitoring	Monitoring	Periodic monitoring events to determine whether soils, sediments, wetland soils, surface water, or groundwater are a continuing source of contamination.	Retained because there will be no removal of contaminants. Can be combined with other GRAs for continued assessment of existing site conditions. Moderate cost.	Common Approach

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
Soil Removal	Excavation	Bulk Mechanical Excavation	Use of common construction equipment to remove contaminated soil. Addresses soil above the groundwater table.	Retained for protection of human health and protection of ecological receptors. This option alone may not be protective of groundwater if contamination is present below groundwater table. Effective for all site contaminants. Moderate cost.	Common Approach
Soil Disposal	Disposal	Out-of-Town Landfill	Transport and disposal of untreated soil to an approved out-of-town landfill.	Retained as potentially effective. Must be reviewed in concert with excavation technology. Moderate to high cost.	Common Approach
		In-Town Landfill	Disposal of untreated soil in a specially constructed landfill within the City of Stratford.	Retained as potentially effective. May not be feasible for entire volume of contaminated soil as area is comprised of numerous small parcels. Must be reviewed in concert with excavation technology. Low cost.	Common Approach
Soil Containment	Horizontal Barriers	Impermeable Cap	Asphalt, concrete, geosynthetics, or multi-media materials are used to form an impermeable barrier to prevent direct contact with contaminated soil and to minimize leaching of contaminants from soil to groundwater.	Retained for protection of human health and protection of ecological receptors. Moderate cost.	Common Approach
		Permeable Cover	Soil, crushed stone, geosynthetics and vegetative cover used to prevent direct contact with contaminated soil and minimize erosion and surface migration of contaminated soil.	Retained as potentially applicable for protection of human health and ecological receptors. Not protective of groundwater. Low cost.	Common Approach

[shaded box] Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
Soil Containment (cont'd)	Vertical Barriers	Sheet Pile Wall	Steel sheet piles are used to construct a vertical barrier, or wall, around contaminated areas to isolate contaminated soils and groundwater and prevent migration.	Eliminated. Typically used to control migration of groundwater. Limited usefulness with soil. Not protective of human health and ecological receptors. Low cost.	Well Established
		Slurry Wall	A vertical barrier consisting of low permeability material is constructed around contaminated areas to isolate contaminated soils and groundwater and prevent migration.	Eliminated. Typically used to control migration of groundwater. Limited usefulness with soil. Not protective of human health and ecological receptors. Low cost.	Well Established
Soil Treatment	Immobilization	Solidification/ Stabilization	Soil mixing equipment used to mix reagents with contaminated soil to physically and/or chemically decrease the mobility of contaminants. Potential reagents include cement, pozzolanic material, thermoplastics, polymers and asphalt. Treatment may be done in situ or ex situ.	Retained as potentially effective. Demonstrated to be effective with metals and other inorganic (asbestos) and organic (SVOCs, PCBs) contaminants. Moderate cost.	Well Established
		Microencapsul-ation	Contaminated material is encapsulated by containers or inert and impervious coatings that will minimize leaching. Treatment will be done ex situ.	Eliminated. Effectively isolates all site contaminants but no treatment occurs. Not feasible in cases involving large quantities of contaminated material. High cost.	Not Well Established

(shaded) Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
Soil Treatment (cont'd)	Thermal Treatment	Incineration	Destruction of organic contaminants by subjecting them to high temperatures under controlled conditions in a combustion chamber. Treatment will be done ex situ.	Eliminated. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). Not easily undertaken within the town of Stratford, on or off site. High cost.	Well Established
		Pyrolysis	Chemical decomposition of organic contaminants by heating the material in the absence of oxygen. Treatment will be done ex situ.	Eliminated. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). Not easily undertaken within the town of Stratford, on- or off site. High cost.	Not Well Established
		Thermal Desorption	Air, heat and mechanical agitation are used to volatilize organic contaminants from soil into a vapor stream. Vapor is usually further treated. Treatment will be done ex situ.	Retained for potential use at an in-town location. Eliminated for use at and out-of-town location. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). May be used as part of a treatment train. Moderate cost.	Well Established
		Supercritical Water Oxidation	Contaminated soil is exposed to water in a high temperature, high pressure environment. Under such conditions, organic substances are oxidized. Treatment will be done ex situ.	Eliminated. Effective for some organic contaminants (SVOCs) but not effective for inorganic contaminants (metals, asbestos) and PCBs. High cost.	Not Well Established

Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
Soil Treatment (cont'd)		Vitrification	Melting of contaminated material to volatilize or pyrolyze organics and entrain inorganics in a stable vitreous residual. Treatment may be done in situ or ex situ.	Retained. Potentially effective for all site contaminants. High cost.	Well Established
	Physical Treatment	Soil Flushing	Contaminants sorbed to soil are mobilized or dissolved in an aqueous flushing solution in situ. The flushing solution is then extracted form the subsurface and treated. Flushing solution may be augmented by chemicals which increase the mobilization or dissolution of organics and some heavy metals from the soil. Treatment will be done in situ.	Eliminated. Difficult to ensure capture of flushing solution due to shallow water table. Not a reliable method in cases involving multiple types of contaminants. Moderate cost.	Well Established
		Soil Washing	Process reduces the amount of contaminated material by two means. Finer particles, which contain the bulk of contaminants, are separated from more coarse material. Contaminants sorbed to soil are dissolved in an aqueous washing solution. The wash water may be augmented by chemicals which increase the leaching of organics and some heavy metals from the soil. Treatment may be done in situ or ex situ.	Retained. Potentially effective for organics (SVOCs, PCBs) and some inorganics (metals, asbestos), but multiple washing steps may be necessary. Washing solution would need to be recovered and treated. Not a reliable method in cases involving multiple types of contaminants. May be used as part of a "treatment train". Can be done on or off site within Stratford. Moderate to high cost.	Well Established

[shaded box] Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
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RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
Soil Treatment (cont'd)		Liquefied Gas Solvent Extraction	Liquefied gas solvents, such as propane, are used to extract organics from soil. Treatment will be done in situ.	Eliminated. Technology is not commercially available and effectiveness is not well established. Cost information not available.	Not Well established
		Soil Vapor Extraction	In situ technology in which vacuum blowers and extraction wells are used to strip volatile organic compounds from unsaturated soil. Treatment will be done in situ.	Eliminated. Only effective for volatile organic compounds (VOCs) in non-saturated soils. Not effective for SVOCs, metals, PCBs, asbestos. Moderate cost.	Well Established
		Electrokinetics	Electrodes are used to manipulate soil conditions to recover or destroy organics and metals. Treatment will be done in situ.	Eliminated. Potentially effective for organic (SVOCs, PCBs) and some inorganics (metals) but not effective for asbestos. Less effective in cases involving shallow water table. Cost information not available.	Not Well Established
	Chemical Treatment	Chemical Dechlorination	Chlorine atoms are stripped form chlorinated contaminants through chemical reactions to produce less toxic byproducts. These byproducts are generally more amenable to biodegradation. Treatment will be done ex situ.	Eliminated. Only addresses chlorinated compounds (PCBs). PCBs are very stable - may be resistant to dechlorination. Not effective for non-chlorinated organics (SVOCs) or inorganics (metals, asbestos). Cost information not available.	Not Well Established

Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
			ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)		
Soil Treatment (cont'd)		Chemical Oxidation	Oxidants are injected into the subsurface where they react with contaminants to form harmless end products. Can be used to remediate a wide range of organic contaminants. Treatment will be done in situ.	Eliminated. Generally used for treatment of groundwater. Does not address inorganic contaminants (metals, asbestos). PCBs may be difficult to oxidize. Moderate cost.	Well Established
		Solvent Extraction	Chemical desorption and dissolution of organic and some inorganic contaminants by washing soil with a solvent solution. Treatment will be done ex situ.	Eliminated. Not effective for wastes with multiple contaminant types. Not effective for asbestos. Solvent solution would need to be recovered and treated. Moderate cost.	Well Established
	Biological Treatment	Aerobic Biodegradation	Microorganisms degrade organic contaminants to carbon dioxide and water. Oxygen is used as an electron acceptor in the degradation process. Treatment may be done in situ or ex situ.	Eliminated. Effectiveness is limited to certain organic contaminants. Metals, PCBs, and asbestos are generally not amenable to biological treatment. Low cost.	Well Established
		Anaerobic Biodegradation	An electron acceptor other than oxygen is used in the process in which microorganisms degrade organic contaminants. Treatment may be done in situ or ex situ.	Eliminated. While this technology is commonly used in the wastewater treatment industry to effectively treat solid organic waste, applications in hazardous waste treatment are limited. Effectiveness is limited to certain organic contaminants. Metals, PCBs, & asbestos are generally not amenable to biological treatment. Low cost.	Not Well Established

(shaded) Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: SOILS (Areas B, C, and F)					
Soil Treatment (cont'd)		Phytoremediation	Plants are used to naturally remediate contaminants via three mechanisms: direct uptake and accumulation of contaminants in plant tissue, release of enzymes that stimulate microbial activity and biochemical transformation, and enhancement of mineralization in plants' roots. Effective for destruction of some VOCs and SVOCs and effective for absorbing many inorganics. Not demonstrated as effective for PCBs. Treatment will be done in situ.	Eliminated . Potentially effective for metals, SVOCs; not effective for asbestos, PCBs. Root systems of plants may not extend deep enough to remediate contaminants at depth. Plants would require harvesting, proper disposal, and replanting. Reliable cost information not available.	Not Well Established
Consolidation	Consolidation	Consolidation	Transport and consolidation of contaminated material at an in-town location.	Retained. Must be reviewed in concert with excavation technology. Low cost.	Well Established
Other					

Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
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GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
No Action	No Action	Not Applicable	No Action	Retained. Used as baseline for comparison with other options as required by NCP. Low cost.	Common Approach
Limited Action	Institutional Controls	Deed Restrictions	Administrative action used to restrict future site activities on individual properties. Restrictions would prevent activities such as excavation or residential development.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
		Local Ordinances	Administrative action used to limit property use and activities such as well installation.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
	Access Restrictions	Fencing	Barrier erected to restrict access to contaminated properties.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
		Post Signs	Post "No Trespassing" or hazard warning signs.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
	Long-Term Monitoring	Monitoring	Periodic monitoring events to determine whether soils, sediments, wetland soils, surface water, or groundwater are a continuing source of contamination.	Retained because there will be no removal of contaminants. Can be combined with other GRAs for continued assessment of existing site conditions. Moderate cost.	Common Approach

Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
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GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Removal	Excavation	Bulk Mechanical Excavation	Use of common construction equipment to remove contaminated material.	Retained as potentially effective for protection of human health and protection of ecological species. Dewatering of saturated material and water treatment will be required. Effective for all site contaminants. Moderate to high cost.	Common Approach
		Dredging	Mechanical dredging equipment may be used to remove saturated material.	Retained as potentially effective for protection of human health and protection of ecological species. Dewatering of saturated material and water treatment will be required. Effective for all site contaminants. Moderate to high cost.	Well Established
	Disposal	Out-of-Town Landfill	Transport and disposal of untreated soil to an approved out-of-town landfill.	Retained as potentially effective. Must be reviewed in concert with excavation/dredging technology. Material may require stabilization prior to transport and disposal. Moderate to high cost.	Common Approach

▒ Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
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GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Removal (cont.)		In-Town Landfill	Disposal of untreated soil in a specially constructed landfill within the City of Stratford.	Retained as potentially effective. May not be feasible for entire volume of contaminated material as area is comprised of numerous small parcels. Must be reviewed in concert with excavation/dredging technology. Material may require stabilization prior to transport and disposal. Low cost.	Common Approach
Wetland Soil Containment	Horizontal Barriers	Impermeable Cap	Asphalt, concrete, geosynthetics, or multi-media materials are used to form an impermeable barrier to prevent direct contact with contaminated soil and to minimize leaching of contaminants from soil to groundwater.	Retained for protection of human health and protection of ecological receptors. Moderate cost.	Common Approach
		Permeable Cover	Soil, crushed stone, geosynthetics and vegetative cover used to prevent direct contact with contaminated soil and minimize erosion and surface migration of contaminated soil.	Retained as potentially effective for protection of human health and ecological receptors. Low cost.	Common Approach
	Vertical Barriers	Sheet Pile Wall	Steel sheet piles are used to construct a vertical barrier, or wall, around contaminated areas to isolate contaminated soils and groundwater and prevent migration.	Eliminated. Typically used to control migration of groundwater. Limited usefulness with soil. Not protective of human health and ecological receptors. Low cost.	Well Established

Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
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GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Containment (cont'd)		Slurry Wall	A vertical barrier consisting of low permeability material is constructed around contaminated areas to isolate contaminated soils and groundwater and prevent migration.	Eliminated. Typically used to control migration of groundwater. Limited usefulness with soil. Not protective of human health and ecological receptors. Low cost.	Well Established
Wetland Soil Treatment	Immobilization	Solidification/ Stabilization	Soil mixing equipment used to mix reagents with contaminated soil to physically and/or chemically decrease the mobility of contaminants. Potential reagents include cement, pozzolanic material, thermoplastics, polymers and asphalt. Treatment may be done in situ or ex situ.	Retained as potentially effective. Demonstrated to be effective with metals and other inorganic (asbestos) and organic (SVOCs, PCBs) contaminants. Moderate cost.	Well Established
		Microencapsulation	Contaminated material is encapsulated by containers or inert and impervious coatings that will minimize leaching. Treatment will be done ex situ.	Eliminated. Effectively isolates all site contaminants but no treatment occurs. Not feasible in cases involving large quantities of contaminated material. High cost.	Not Well Established
	Thermal Treatment	Incineration	Destruction of organic contaminants by subjecting them to high temperatures under controlled conditions in a combustion chamber. Treatment will be done ex situ.	Eliminated. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). Not easily undertaken within the town of Stratford, on or off site. High cost.	Well Established

▒ Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Treatment (cont.)		Pyrolysis	Chemical decomposition of organic contaminants by heating the material in the absence of oxygen. Treatment will be done ex situ.	Eliminated. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). Not easily undertaken within the town of Stratford, on or off site. High cost.	Not Well Established
		Thermal Desorption	Air, heat and mechanical agitation are used to volatilize organic contaminants from soil into a vapor stream. Vapor is usually further treated. Treatment will be done ex situ.	Retained for potential use at an in-town location. Eliminated for use at and out-of-town location. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). May be used as part of a treatment train. Moderate cost.	Well Established
		Supercritical Water Oxidation	Contaminated soil is exposed to water in a high temperature, high pressure environment. Under such conditions, organic substances are oxidized. Treatment will be done ex situ.	Eliminated. Effective for some organic contaminants (SVOCs) but not effective for inorganic contaminants (metals, asbestos) and PCBs. High cost.	Not Well Established
		Vitrification	Melting of contaminated material to volatilize or pyrolyze organics and entrain inorganics in a stable vitreous residual. Treatment may be done in situ or ex situ.	Retained. Potentially effective for all site contaminants. High cost.	Well Established

Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Treatment (cont'd)	Physical Treatment	Soil Flushing	Contaminants sorbed to soil are mobilized or dissolved in an aqueous flushing solution in situ. The flushing solution is then extracted form the subsurface and treated. Flushing solution may be augmented by chemicals which increase the mobilization or dissolution of organics and some heavy metals from the soil. Treatment will be done in situ.	Eliminated. Difficult to ensure capture of flushing solution due to shallow water table. Not a reliable method in cases involving multiple types of contaminants. Moderate cost.	Well Established
		Soil Washing	Process reduces the amount of contaminated material by two means. Finer particles, which contain the bulk of contaminants, are separated from more coarse material. Contaminants sorbed to soil are dissolved in an aqueous washing solution. The wash water may be augmented by chemicals which increase the leaching of organics and some heavy metals from the soil. Treatment may be done in situ or ex situ.	Retained. Potentially effective for organics (SVOCs, PCBs) and some inorganics (metals, asbestos), but multiple washing steps may be necessary. Washing solution would need to be recovered and treated. Not a reliable method in cases involving multiple types of contaminants. May be used as part of a "treatment train". Can be done on or off site within Stratford. Moderate to high cost.	Well Established
		Liquefied Gas Solvent Extraction	Liquefied gas solvents, such as propane, are used to extract organics from soil. Treatment will be done in situ.	Eliminated. Technology is not commercially available and effectiveness is not well established. Cost information not available.	Not Well established

(shaded) Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
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ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Treatment (cont'd)		Soil Vapor Extraction	Chemical desorption and dissolution of organic and some inorganic contaminants by washing soil with a solvent solution. Treatment will be done ex situ.	Eliminated. Only effective for volatile organic compounds (VOCs) in non-saturated soils. Not effective for SVOCs, metals, PCBs, asbestos. Moderate cost.	Well Established
		Electrokinetics	Electrodes are used to manipulate soil conditions to recover or destroy organics and metals. Treatment will be done in situ.	Eliminated. Potentially effective for organic (SVOCs, PCBs) and some inorganics (metals) but not effective for asbestos. Less effective in cases involving shallow water table. Cost information not available.	Not Well Established
	Chemical Treatment	Chemical Dechlorination	Chlorine atoms are stripped form chlorinated contaminants through chemical reactions to produce less toxic byproducts. These byproducts are generally more amenable to biodegradation. Treatment will be done ex situ.	Eliminated. Only addresses chlorinated compounds (PCBs). PCBs are very stable - may be resistant to dechlorination. Not effective for non-chlorinated organics (SVOCs) or inorganics (metals, asbestos). Cost information not available.	Not Well Established
		Chemical Oxidation	Oxidants are injected into the subsurface where they react with contaminants to form harmless end products. Can be used to remediate a wide range of organic contaminants. Treatment will be done in situ.	Eliminated. Does not address inorganic contaminants (metals, asbestos). PCBs may be difficult to oxidize. Moderate cost.	Well Established

▒ Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
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ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Treatment (cont'd)		Solvent Extraction	Chemical desorption and dissolution of organic and some inorganic contaminants by washing soil with a solvent solution. Treatment will be done ex situ.	Eliminated. Not effective for wastes with multiple contaminant types. Not effective for asbestos. Solvent solution would need to be recovered and treated. Moderate cost.	Well Established
	Biological Treatment	Aerobic Biodegradation	Microorganisms degrade organic contaminants to carbon dioxide and water. Oxygen is used as an electron acceptor in the degradation process. Treatment may be done in situ or ex situ.	Eliminated. Effectiveness is limited to certain organic contaminants. Metals, PCBs, and asbestos are generally not amenable to biological treatment. Low cost.	Well Established
		Anaerobic Biodegradation	An electron acceptor other than oxygen is used in the process in which microorganisms degrade organic contaminants. Treatment may be done in situ or ex situ.	Eliminated. While this technology is commonly used in the wastewater treatment industry to effectively treat solid organic waste, applications in hazardous waste treatment are limited. Effectiveness is limited to certain organic contaminants. Metals, PCBs, & asbestos are generally not amenable to biological treatment. Low cost.	Not Well Established

Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: WETLAND SOILS (Areas B, C, and F)					
Wetland Soil Treatment (cont'd)		Phytoremedia-tion	Plants are used to naturally remediate contaminants via three mechanisms: direct uptake and accumulation of contaminants in plant tissue, release of enzymes that stimulate microbial activity and biochemical transformation, and enhancement of mineralization in plants' roots. Effective for destruction of some VOCs and SVOCs and effective for absorbing many inorganics. Not demonstrated as effective for PCBs. Treatment will be done in situ.	Eliminated. Potentially effective for metals, SVOCs; not effective for asbestos, PCBs. Root systems of plants may not extend deep enough to remediate contaminants at depth. Plants would require harvesting, proper disposal, and replanting. Reliable cost information not available.	Not Well Established
Consolidation	Consolidation	Consolidation	Transport and consolidation of contaminated material at an in-town location.	Retained. Must be reviewed in concert with excavation technology. . Material may require stabilization prior to transport and disposal. Low cost.	Well Established
Other					

▒ Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
No Action	No Action	Not Applicable	No Action	Retained. Used as baseline for comparison with other options as required by NCP. Low cost.	Common Approach
Limited Action	Institutional Controls	Deed Restrictions	Administrative action used to restrict future site activities on individual properties. Restrictions would prevent activities such as excavation or residential development.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
		Local Ordinances	Administrative action used to limit property use and activities such as well installation.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
	Access Restrictions	Fencing	Barrier erected to restrict access to contaminated properties.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
		Post Signs	Post "No Trespassing" or hazard warning signs.	Retained for protection of human health. Not protective of ecological receptors or groundwater. Low cost.	Common Approach
	Long-Term Monitoring	Groundwater Monitoring	Periodic monitoring events to determine whether soils, sediments, wetland soils, surface water, or groundwater are a continuing source of contamination.	Retained because there will be no removal of contaminants. Can be combined with other GRAs for continued assessment of existing site conditions. Moderate cost.	Common Approach

Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Removal	Excavation	Bulk Mechanical Excavation	Use of common construction equipment to remove contaminated material.	Retained as potentially effective for protection of human health and protection of ecological species. Excessive handling and dewatering of saturated material and water handling and treatment will be required. Effective for all site contaminants. Moderate to high cost.	Common Approach
		Dredging	Mechanical dredging equipment may be used to remove saturated material.	Retained as potentially effective for protection of human health and protection of ecological species. Dewatering of saturated material and water treatment will be required. Effective for all site contaminants. Moderate to high cost.	Well Established
Sediment Disposal	Disposal	Out-of-Town Landfill	Transport and disposal of untreated sediments to an approved out-of-town landfill.	Retained as potentially effective. Must be reviewed in concert with excavation/dredging technology. Material may require stabilization prior to transport and disposal. Moderate to high cost.	Common Approach

▒ Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT
PAGE 20 OF 27

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Disposal (cont.)		In-Town Landfill	Disposal of untreated sediments in a specially constructed landfill within the City of Stratford.	Retained as potentially effective. May not be feasible for entire volume of contaminated material as area is comprised of numerous small parcels. Must be reviewed in concert with excavation/dredging technology. Material may require stabilization prior to transport and disposal. Low cost.	Common Approach
Sediment Containment	Horizontal Barriers	Subaqueous Permeable Cap	Clean sediment and geosynthetics used to prevent direct contact with contaminated sediment.	Retained for protection of human health. May not be protective of ecological receptors. Low cost.	Common Approach
		Subaqueous Impermeable Cap	Clean sediment and geosynthetics are used to create an impermeable barrier between contaminated sediment and water in Ferry Creek.	Eliminated. Not feasible due to groundwater discharge to Ferry Creek. Also, tidal exchanges and flooding potential within Ferry Creek and the Housatonic River present difficult engineering issues to resolve. Moderate cost.	Well Established
		Rip Rap	Rip rap and geotextile are placed over contaminated sediment in Ferry Creek to prevent direct contact and erosion and migration of contaminated sediment.	Retained for protection of human health. May not be protective of groundwater or ecological receptors. Low cost.	Common Approach
		Culvert	Construct concrete culvert to contain flow of Ferry Creek and prevent direct contact with creek sediments.	Retained for protection of human health. May not be protective of groundwater or ecological receptors. Moderate cost.	Common Approach

(shaded) Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Treatment	Immobilization	Solidification/ Stabilization	Equipment used to mix reagents with contaminated sediments to physically and/or chemically decrease the mobility of contaminants. Potential reagents include cement, pozzolanic material, thermoplastics, polymers and asphalt. Treatment may be done in situ or ex situ.	Retained as potentially effective. Demonstrated to be effective with metals and other inorganic (asbestos) and organic (SVOCs, PCBs) contaminants. Moderate cost.	Well Established
		Microencapsulation	Contaminated material is encapsulated by containers or inert and impervious coatings that will minimize leaching. Treatment will be done ex situ.	Eliminated. Effectively isolates all site contaminants but no treatment occurs. Not feasible in cases involving large quantities of contaminated material. High cost.	Not Well Established
	Thermal Treatment	Incineration	Destruction of organic contaminants by subjecting them to high temperatures under controlled conditions in a combustion chamber. Treatment will be done ex situ.	Eliminated. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). Not easily undertaken within the town of Stratford, on or off site. High cost.	Well Established
		Pyrolysis	Chemical decomposition of organic contaminants by heating the material in the absence of oxygen. Treatment will be done ex situ.	Eliminated. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). Not easily undertaken within the town of Stratford, on or off site. High cost.	Not Well Established

[shaded box] Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Treatment (Cont'd)		Thermal Desorption	Air, heat and mechanical agitation are used to volatilize organic contaminants from sediments into a vapor stream. Vapor is usually further treated. Treatment will be done ex situ.	Retained for potential use at an in-town location. Eliminated for use at and out-of-town location. Effective for organic contaminants (SVOCs, PCBs) but not effective for inorganic contaminants (metals, asbestos). May be used as part of a treatment train. Moderate cost.	Well Established
		Supercritical Water Oxidation	Contaminated sediments is exposed to water in a high temperature, high pressure environment. Under such conditions, organic substances are oxidized. Treatment will be done ex situ.	Eliminated. Effective for some organic contaminants (SVOCs) but not effective for inorganic contaminants (metals, asbestos) and PCBs. High cost.	Not Well Established
		Vitrification	Melting of contaminated material to volatilize or pyrolyze organics and entrain inorganics in a stable vitreous residual. Treatment will be done ex situ.	Retained. Potentially effective for all site contaminants. High cost.	Well Established

[shaded box] Eliminated process option (see screening comment)

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Treatment (cont'd)	Physical Treatment	Soil Flushing	Contaminants sorbed to sediments are mobilized or dissolved in an aqueous flushing solution in situ. The flushing solution is then extracted form the subsurface and treated. Flushing solution may be augmented by chemicals which increase the mobilization or dissolution of organics and some heavy metals from the sediments. Treatment will be done in situ.	Eliminated. Not effective for saturated sediments. Not a reliable method in cases involving multiple types of contaminants. Moderate cost.	Well Established
		Soil Washing	Process reduces the amount of contaminated material by two means. Finer particles, which contain the bulk of contaminants, are separated from more coarse material. Contaminants sorbed to sediments are dissolved in an aqueous washing solution. The wash water may be augmented by chemicals which increase the leaching of organics and some heavy metals from the sediments. Treatment will be done ex situ.	Retained. Potentially effective for organics (SVOCs, PCBs) and some inorganics (metals, asbestos), but multiple washing steps may be necessary. Washing solution would need to be recovered and treated. Not a reliable method in cases involving multiple types of contaminants. May be used as part of a "treatment train". Can be done on or off site within Stratford. Moderate to high cost.	Well Established

Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Treatment (cont'd)		Liquefied Gas Solvent Extraction	Liquefied gas solvents, such as propane, are used to extract organics from sediments. Treatment will be done in situ.	Eliminated. Technology is not commercially available and effectiveness is not well established. Not effective for saturated sediments. Cost information not available.	Not Well established
		Soil Vapor Extraction	In situ technology in which vacuum blowers and extraction wells are used to strip volatile organic compounds from unsaturated sediments. Treatment will be done in situ.	Eliminated. Only effective for volatile organic compounds (VOCs) in non-saturated soils. Not effective for SVOCs, metals, PCBs, asbestos. Moderate cost.	Well Established
		Electrokinetics	Electrodes are used to manipulate sediments conditions to recover or destroy organics and metals. Treatment will be done in situ.	Eliminated. Potentially effective for organic (SVOCs, PCBs) and some inorganics (metals) but not effective for asbestos. Not effective for saturated sediments. Cost info not available.	Not Well Established
	Chemical Treatment	Chemical Dechlorination	Chlorine atoms are stripped form chlorinated contaminants through chemical reactions to produce less toxic byproducts. These byproducts are generally more amenable to biodegradation. Treatment will be done ex situ.	Eliminated. Only addresses chlorinated compounds (PCBs). PCBs are very stable - may be resistant to dechlorination. Not effective for non-chlorinated organics (SVOCs) or inorganics (metals, asbestos). Cost information not available.	Not Well Established

Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Treatment (cont'd)		Chemical Oxidation	Oxidants are injected into the subsurface where they react with contaminants to form harmless end products. Can be used to remediate a wide range of organic contaminants. Treatment will be done in situ.	Eliminated. Does not address inorganic contaminants (metals, asbestos). PCBs may be difficult to oxidize. Not effective for saturated sediments. Moderate cost.	Well Established
		Solvent Extraction	Chemical desorption and dissolution of organic and some inorganic contaminants by washing sediments with a solvent solution. Treatment will be done ex situ.	Eliminated. Not effective for wastes with multiple contaminant types. Not effective for asbestos. Solvent solution would need to be recovered and treated. Moderate cost.	Well Established
	Biological Treatment	Aerobic Biodegradation	Microorganisms degrade organic contaminants to carbon dioxide and water. Oxygen is used as an electron acceptor in the degradation process. Treatment may be done in situ or ex situ.	Eliminated. Effectiveness is limited to certain organic contaminants. Metals, PCBs, and asbestos are generally not amenable to biological treatment. Low cost.	Well Established
		Anaerobic Biodegradation	An electron acceptor other than oxygen is used in the process in which microorganisms degrade organic contaminants. Treatment may be done in situ or ex situ.	Eliminated. While this technology is commonly used in the wastewater treatment industry to effectively treat solid organic waste, applications in hazardous waste treatment are limited. Effectiveness is limited to certain organic contaminants. Metals, PCBs, & asbestos are generally not amenable to biological treatment. Low cost.	Not Well Established

(shaded) Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Sediment Treatment (cont'd)		Phytoremediation	Plants are used to naturally remediate contaminants via three mechanisms: direct uptake and accumulation of contaminants in plant tissue, release of enzymes that stimulate microbial activity and biochemical transformation, and enhancement of mineralization in plants' roots. Effective for destruction of some VOCs and SVOCs and effective for absorbing many inorganics. Not demonstrated as effective for PCBs. Treatment will be done in situ.	Eliminated . Potentially effective for metals, SVOCs; not effective for asbestos, PCBs. Root systems of plants may not extend deep enough to remediate contaminants at depth. Plants would require harvesting, proper disposal, and replanting. Reliable cost information not available.	Not Well Established

▒ Eliminated process option (see screening comment)

TABLE 2-7 (cont.)
PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS
DRAFT TECHNICAL MEMORANDUM
REMEDIAL ALTERNATIVES SCREENING
RAYMARK – OU7
STRATFORD, CONNECTICUT

GENERAL RESPONSE ACTIONS (GRA)	REMEDIAL TECHNOLOGY TYPES	PROCESS OPTIONS	DESCRIPTION OF REMEDIAL TECHNOLOGY TYPES	SCREENING COMMENT[1]	STATUS[2]
ENVIRONMENTAL MEDIUM: FERRY CREEK SEDIMENTS (Areas B, C, and F)					
Consolidation	Consolidation	Consolidation	Transport and consolidation of contaminated material at an in-town location.	Retained. Must be reviewed in concert with excavation technology. . Material may require stabilization prior to transport and disposal. Low cost.	Well Established
Other					

Note:
"On-site" refers to within the study area. "Off-site" refers to outside the study area.
1. See Section 2.4 for a further discussion of technologies which were retained or were eliminated for reasons other than "not well established".
2. Status terms are defined as:
   Common Approach: Method which is commonly used and widely accepted in the environmental engineering field.
   Well Established: Method proven to be feasible on a full-scale basis, but may not be commonly used in the environmental engineering field.
   Not Well Established: Use of method to date is generally confined to field trials or bench scale studies.

▒ Eliminated process option (see screening comment)

TABLE 2-8
APPROXIMATE COST OF APPLICABLE REMEDIAL TECHNOLOGIES
DRAFT TECHNICAL MEMORANDUM
RAYMARK - OU7
STRATFORD, CONNECTICUT

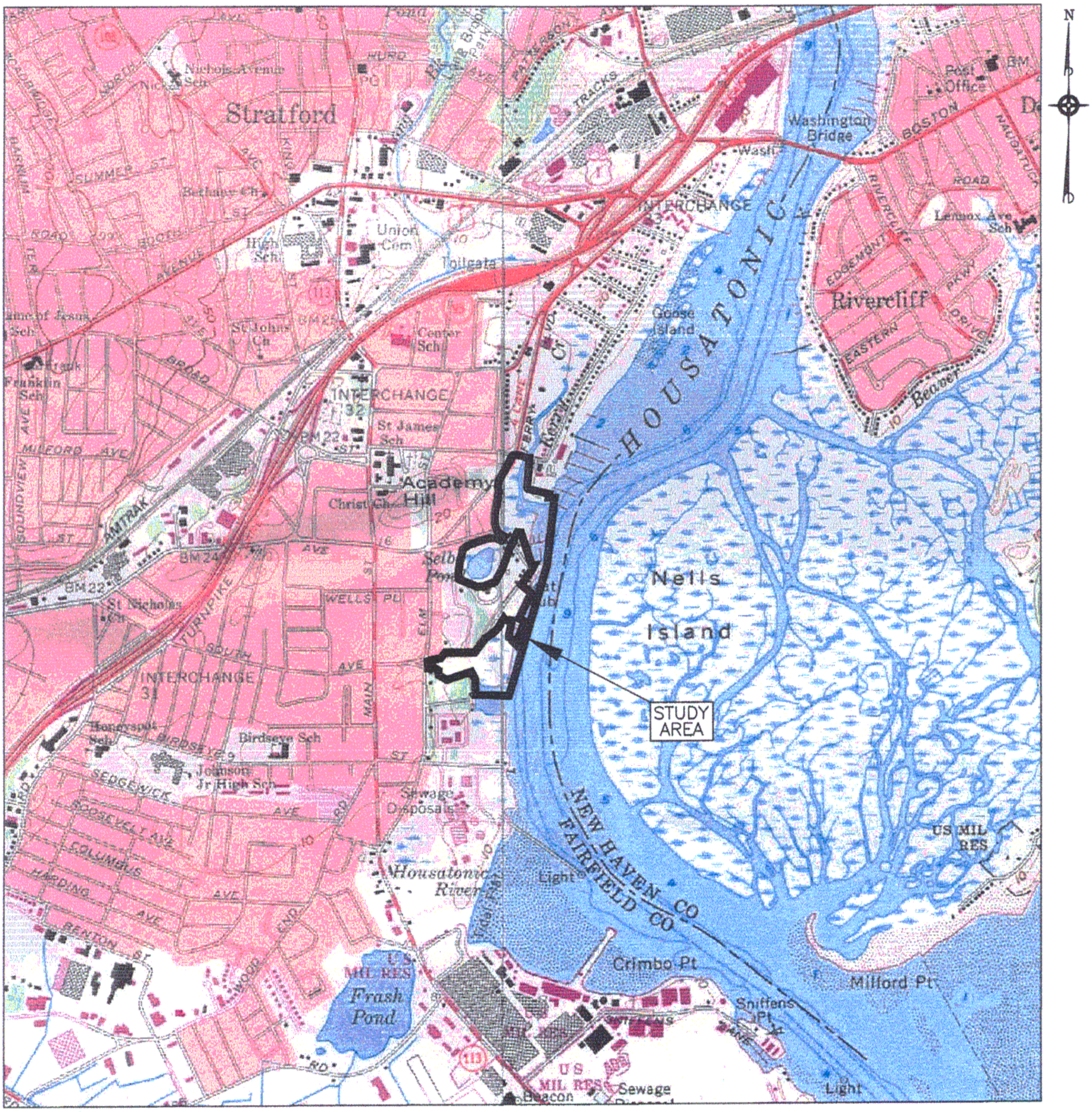
GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTION	APPROXIMATE COST ($ per CY)			Approximate Additional Costs per CY[8] ($)
			Soils	Wetland Soils	Sediments	
No Action	No Action	Not Applicable	0	0	0	0 to 0
Limited Action	Institutional Controls	Deed Restrictions	0	0	0	0 to 0
		Local Ordinances	0	0	0	0 to 0
	Access Restrictions	Fencing	0	0	0	0 to 0
		Post Signs	0	0	0	0 to 0
	Long Term Monitoring	Monitoring	0	0	0	0 to 0
Removal	Excavation	Mechanical Excavation*[1]	9.5	11.5	14	3 to 7
	Dredging (includes dewatering)	Mechanical dredging[1]	NA	75	75	19 to 38
		Hydraulic dredging[1]	NA	220	220	55 to 110
		Pneumatic dredging[2]	NA	220	220	55 to 110
Disposal	Disposal	Out-of-Town[3]	170	170	170	43 to 85
		In-Town Landfill ($7.81/SF)[1,3]	18	18	18	5 to 9
Removal and/or Treatment	Immobilization	Solidification/Stabilization[5]	50-80	50-80	50-80	13 to 40
	Thermal Treatment	Vitrification[5]	300-500	300-500	300-500	75 to 250
		Thermal Desorption[5]	60-100	60-100	60-100	15 to 50
	Physical Treatment	Soil Washing[3]	130	130	130	33 to 65
Containment	Horizontal Barriers	Impermeable Cap ($3.05/SF)[1]	15-26	21	NA	4 to 13
		Permeable Cover ($0.63/SF)[1]	3-5.5	4.5	4.5	1 to 3
		Rip Rap ($2.83/SF)[1]	NA	19	19	5 to 10
		Culvert ($3,500/LF)[6]	NA	NA	900-950	225 to 475
Consolidation	Consolidation	Consolidation[4]	3.5	3.5	3.5	1 to 2
Other						
Other						
Other						

* includes backfilling

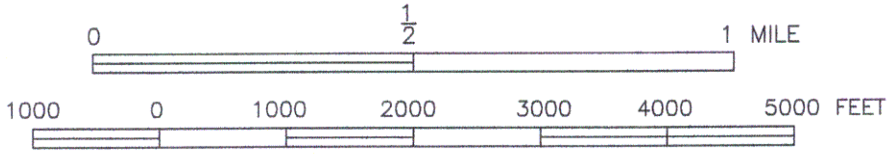
Source of Estimate:

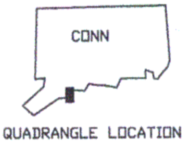
1. From ECHOS Heavy Construction Cost Data Book, published by RS Means Co. 1998.
2. Assumed to be the same as Hydraulic Dredging
3. From ECHOS Environmental Remediation Unit Cost Book, published by RS Means Co. 1998.
4. Assumption based on previous site experience. 3.5 miles @ $20/mile, 20 CY load. Only includes transportation to in-town location.
5. Quote submitted by vendor.
6. Preliminary estimate submitted by Army Corps of Engineers.
7. US EPA. 1994. "ARCS Remediation Guidance Document." EPA-905-B94-003. Great Lakes National Program Office, Chicago, IL.
8. Additional Costs includes expenses for mobilization/demobilization, sampling & analysis, site preparation and restoration, decontamination facilities, well replacement/installation, and other site work needed to support the selected process option(s). Based on detailed cost estimates present in the OU-1 Feasability Study (1995), Additional Costs were assumed to be 25 to 50% of process option unit costs.

FIGURES



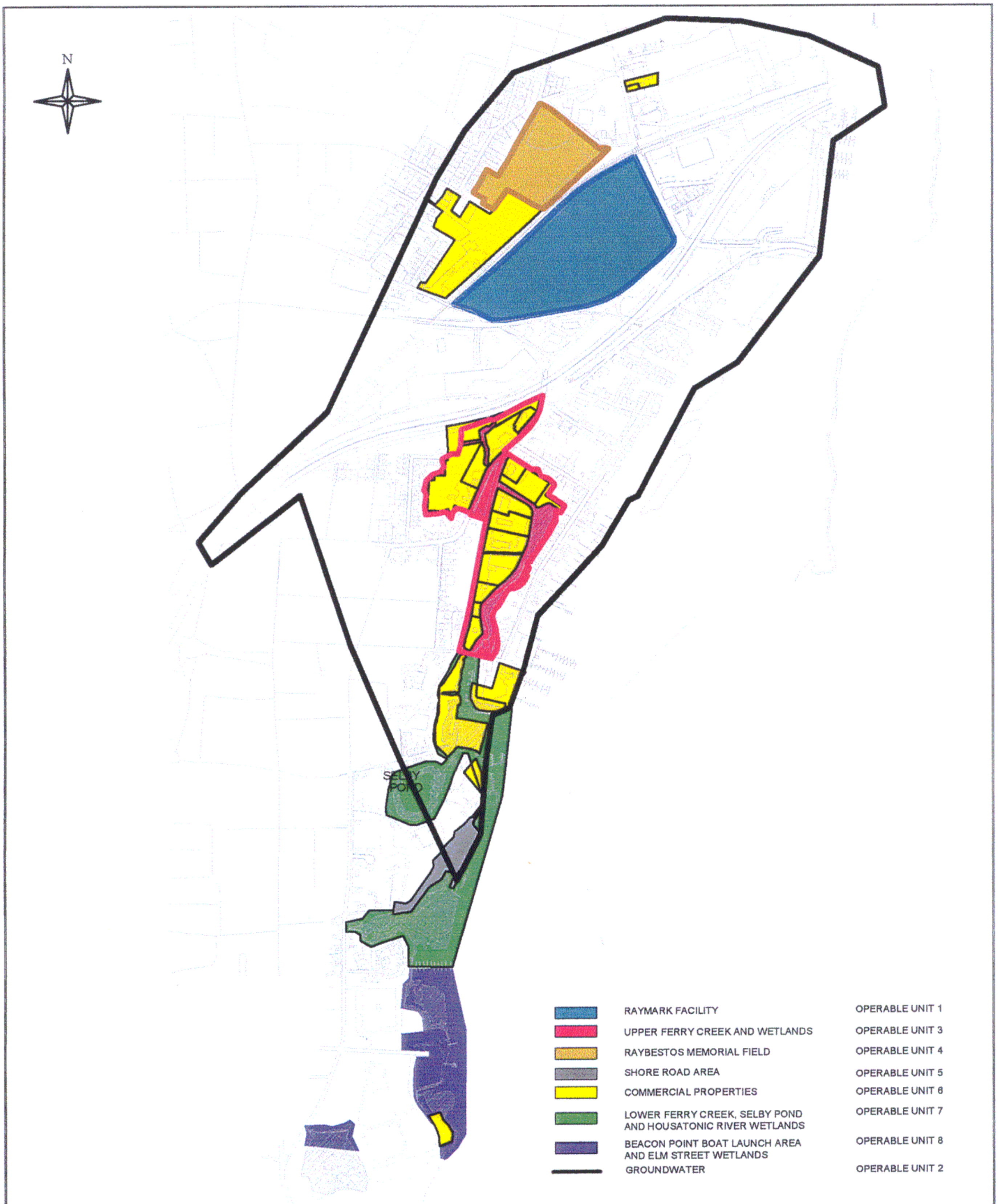
BASEMAP: PORTIONS OF THE FOLLOWING U.S.G.S. QUADRANGLE MAPS: BRIDGEPORT, CONN., 1970 (PHOTOREVISED: 1984) AND MILFORD, CONN., 1960 (PHOTOREVISED: 1984), SCALE ALTERED FOR CLARITY





SITE LOCUS – RAYMARK – OU7	FIGURE 1-1
REMEDIAL ALTERNATIVES SCREENING REPORT	TETRA TECH NUS, INC.
STRATFORD, CONNECTICUT	55 Jonspin Road Wilmington, MA 01887 (978)658-7899

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
PROJECT MANAGER:	H. FORD	DATE:	NOVEMBER 2000
SCALE:	AS SHOWN	ACAD NAME:	DWG\7491\1010\OU7.DWG



400 0 400 800 1200 1600 Feet

NOTES:
1) ALL LOCATIONS AND BOUNDARIES TO BE CONSIDERED APPROXIMATE
2) PLAN NOT TO BE USED FOR DESIGN

RAYMARK OPERABLE UNITS		FIGURE 1-2
REMEDIAL ALTERNATIVES SCREENING REPORT OPERABLE UNIT 7		TETRA TECH NUS, INC.
RAYMARK INDUSTRIES, INC. SUPERFUND SITE STRATFORD, CONNECTICUT		
DRAWN BY: D. A. CHISHOLM	DATE: NOVEMBER 14, 2000	55 JONSPIN ROAD WILMINGTON, MA 01887
SCALE: AS SHOWN	FILE: ...\ALLRAY.APR	(978)658-7899

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