RECORD OF DECISION

US Environmental Protection Agency
Region 1

FLETCHER'S PAINT WORKS
AND
STORAGE FACILITY SUPERFUND SITE

Milford, New Hampshire

CERCLIS No. NHD001079649

September 30, 1998

DECLARATION FOR THE RECORD OF DECISION

Fletcher's Paint Works and Storage Facility Superfund Site
Milford, New Hampshire
CERCLIS No. NHD001079649

STATEMENT OF PURPOSE

This decision document presents the selected remedial action for the Fletcher's Paint Works and Storage Facility Superfund Site (Site) located in Milford, New Hampshire, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 USC § 9601 et seq., as amended, and to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR Part 300 et seq., as amended. The Director of the Office of Site Remediation and Restoration has been delegated the authority to approve this Record Of Decision (ROD).

The State of New Hampshire has not concurred on the selected remedy as of the signing of this ROD. It is anticipated that the State will concur shortly.

STATEMENT OF BASIS

This decision is based on the Administrative Record which has been developed in accordance with Section 113(k) of CERCLA and which is available for public review at the Wadleigh Memorial Library in Milford, New Hampshire and at the US EPA - Region I Office of Site Remediation and Restoration Records Center in Boston, Massachusetts. The Administrative Record Index (Appendix C to the ROD) identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to the public health or welfare or to the environment.

DESCRIPTION OF THE SELECTED REMEDY

This ROD sets forth the selected remedy for Operable Unit One at the Fletcher's Paint Site, which involves the excavation and on-site treatment of principal threat wastes which consist of primarily PCB contaminated soils, the replacement of those treated soils at the Site, and placement of a soil and asphalt cover over the residual low level threat wastes. The selected remedy also includes monitored natural attenuation of the contaminated groundwater in the overburden and bedrock aquifers and institutional controls to prevent future ingestion of contaminated groundwater, as well as restrictions on the use and assess to the subsurface soils at the Elm Street Site. The selected remedy is a comprehensive approach for this operable unit

which addresses all current and potential future risks caused by soil and groundwater contamination. Specifically, Operable Unit One includes the areas referred to as the Elm Street Site, the Mill Street Site, the drainage ditch and the plume of groundwater contamination that exists from the Mill Street Site to the Souhegan River. The remedial measures will prevent the future leaching of PCBs from the low level residual waste, into groundwater in excess of drinking water standards and will allow for restoration of the Site to beneficial uses.

The selected remedy includes these major components:

Soil

Phase 1 - Mill Street Site Cleanup:

To address the current and future risks associated with dermal contact or ingestion of the contaminated surface and subsurface soils at the Mill Street Site, the activities would include:

- Excavation of approximately 1,500 yd^3 of surface soils (0 to 1 foot) at the Mill Street Site to a depth of 1 foot, wherever PCB concentrations are greater than 1 mg/kg PCB.

To address the future risks associated with ingestion of contaminated groundwater at the Mill Street Site as a result of leaching, the activities include:

- Excavation of approximately 12,000 yd^3 of subsurface soils at the Mill Street Site (1 to 20 feet (bedrock) below surface), approximately 3,000 yd^3 of which are located below the water table, wherever PCB concentrations remain that exceed 1 mg/kg PCB; or excavation of soils to a PCB concentration at which leaching models and/or soil column testing show that infiltration through the remaining PCB soil concentrations will not result in future groundwater concentrations in excess of the 0.5 ug/l MCL groundwater concentration for PCBs. The determination of a subsurface soil cleanup level other than 1 mg/kg PCB, will be in the sole discretion of the EPA.

- Water collected from the dewatering of the excavated soils and water collected as a result of lowering of the water table to conduct the excavation, will be either treated on-site in a mobile unit and appropriately discharged to the Souhegan River or sent off-site to a treatment facility.

- Treatment of approximately 13,500 yd^3 of excavated soils by ex-situ thermal desorption. The thermal desorption unit would be located on the Elm Street property. This property is currently secured with a fence. Consideration may be given to the use of the former Fletcher's Paint Works building on the Elm Street Site as storage to stage and screen the contaminated soils prior to treatment. Liquid PCB condensate produced from the thermal

desorption process will be disposed of off-site at an appropriate facility.

- Demolition and disposal of the Fletcher's Elm Street building prior to, or following thermal desorption activities. The manufacturing portion of this building was used to store paint pigments and chemicals. While these were removed in the 1993 removal action, gross contamination still exists in this facility and therefore some of the debris will have to be disposed of at an appropriate landfill facility. Consideration may be reviewed for use of these materials as fill material on the Site. Decontamination of building material, if warranted, and off-site disposal will be conducted in accordance with TSCA.

- Off-site disposal of all soil and debris that is either oversized or cannot be treated through the thermal desorption unit. All contaminated soil and debris will be disposed of in accordance with TSCA disposal regulations.

- Backfilling of the treated soils back onto the Mill Street Site and restoration of the property consistent with the anticipated future use of the Site. Specifically, the majority of the Mill Street Site will be paved, physically re-aligning Mill Street. The pavement will reduce infiltration of precipitation, control erosion and promote drainage away from the residential properties.

- Regrading and repair of the storm drainage ditch system, as necessary, to promote surface water flow away from the Site. Erosion control measures shall be incorporated into the final drainage system to prevent erosion or debris from restricting future storm water flow from the Mill Street Site or filling in of the drainage ditch.

Phase 2 - Elm Street Site Cleanup:

To address the current and future risks associated with dermal contact or ingestion of the contaminated surface and subsurface soils on the Elm Street Site, the activities would include:

- Excavation of approximately 2,800 yd^3 of surface soils at the Elm Street Site to a depth of 1 foot, wherever PCB concentrations are greater than 1 mg/kg PCB.

- Excavation of approximately 1,000 yd^3 of subsurface soils, within the utility corridor(s), at the Elm Street Site at depths between 1 and 10 feet, wherever PCB concentrations are greater than 25 mg/kg PCB. Final location of the utility corridor(s) within the Site will be determined during design.

- Excavation of approximately 11,600 yd3 of remaining subsurface soils, with the exception of the "hot spot" materials described below, from 1 foot to the seasonally low

water table, wherever PCB concentrations remain that exceed 100 mg/kg; or to a PCB concentration at which leaching models and/or soil column testing show that infiltration through the remaining PCB soil concentrations will not result in future groundwater concentrations in excess of the 0.5 ug/l MCL groundwater concentration for PCBs. The determination of a subsurface soil cleanup level other than 100 mg/kg PCB, will be in the sole discretion of the EPA.

- Excavation and off-site disposal in an appropriate landfill of the EB-03 "hot spot", a semi-solid stain (polyamide and polyurethane) material. This material is not amenable to the thermal desorption process, as the material is comprised of polyurethane, alkyd resins, etc., which may affect the performance of the thermal desorption unit. (The actual volume of this material is estimated to be 1,000 -2,000 yd3, and is considered part of the subsurface excavation volume describe above.)

- Removal and disposal of the 5 underground storage tanks located on the Fletcher's Elm Street property. (This could take also place during Phase 1, if appropriate)

- Treatment of the approximately 15,400 yd^3 of excavated soils by ex-situ thermal desorption. The thermal desorption unit would be preferably located on the Fletcher's Elm Street property. This may involve the placement of the mobile unit at one or more locations on the property during the excavation and treatment operations. Liquid PCB condensate produced from the thermal desorption process will be disposed of off-site at an appropriate facility.

- Backfilling of the treated soils on-site.

- Final grading of and placement of a 10 inch soil cover over the treated soils, or placement of treated soils within the top foot, which can demonstrate PCB concentrations less than or equal to 1 mg/kg PCB. Asphalt would be placed on areas designated for parking, consistent with the final grading plans and the future anticipated use of the Site. The asphalt covering will promote drainage and further minimize infiltration through the residual contamination at the Site. Restoration and landscaping of the remaining areas, not covered by asphalt. Erosion control measures will be incorporated into the final grading to prevent erosion of the cover materials off-site and into the Souhegan River.

- Institutional controls, in the form of deed restrictions would be implemented to prevent unauthorized access into the subsurface. Deed restrictions would also have to implemented to restrict future use of the Site, or the modification of the cover or surface drainage structures in ways inconsistent with this remedy or the anticipated future use of the Site.

Groundwater

- Establish a Groundwater Management Zone (GMZ) under NH's Comprehensive Groundwater Policy. The GMZ sets plume boundaries within which groundwater will be monitored over time to ensure that the contaminant concentrations are decreasing; to ensure that the remaining contamination has not migrated beyond the established plume boundaries or impacted the Souhegan River; and that the remedial action cleanup is working and remaining effective over time. Institutional controls would have to be implemented to restrict the use of the groundwater within the GMZ, while contaminant concentrations are in excess of drinking water standards. Further action may be necessary consistent with the NH Comprehensive groundwater Policy.

- Interim Groundwater Cleanup Levels must be achieved within the GMZ and maintained for a period of three consecutive years. A risk assessment will be performed on residual groundwater contamination to determine protectiveness of the remedy. If EPA determined the remedy is not protective, the remedial action shall continue until protective levels are achieved and not exceeded for three years or until the remedy is deemed protective or is modified.

SPECIAL FINDINGS

Issuance of the ROD embodies specific determinations made by the Regional Administrator pursuant to CERCLA. Under 121 (d)(4)(D) of CERCLA, the Regional Administrator hereby invokes the equivalency waiver for the New Hampshire closure requirements (Env-Wm 708.02)

Further, an interim remedy waiver pursuant to CERCLA 121 (d)(4)(A) is being invoked for the RCRA and TSCA storage limitations for the RI/FS generated wastes since the wastes currently stored on the Site is interim in nature and the final remedy will comply with all ARARs for final disposition of the waste.

DECLARATION

The selected remedy is protective of human health and the environment, attains or waives Federal and State requirements that are applicable or relevant and appropriate for this remedial action and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technology, to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

The selected remedy is a comprehensive approach for the first operable unit, which includes both

source control and management of migration components. The source control portion of the remedy includes excavation and the on-site treatment of PCB contaminated soil by ex-situ thermal desorption. Institutional controls will be employed to limit the surficial future uses of the Elm Street Site to activities deemed recreational, while allowing limited access for utility maintenance within the designated utility. Institutional Controls will be employed to limit future excavation into the subsurface soils at the Elm and Mill Street sites, where PCB concentrations will remain which are protective to groundwater from leaching, but which are in excess of protective human health standards. The management of migration portion of the remedy relies on natural attenuation to restore the contaminated groundwater to its beneficial uses. Treatment will not be utilized to restore the contaminated groundwater because it was determined not to be warranted or cost effective considering the conditions and type of contaminants found at the Site. Active groundwater restoration would not afford a significant cleanup time advantage and, with institutional controls to prevent consumption of groundwater in the interim, the selected remedy is as protective of public health as active restoration. The overall estimated net-present worth cost of the selected remedy is $14,731, 975.

OSWER Directive 9355.7-02 states that five-year reviews will be conducted at sites where cleanup levels will take five or more years to achieve (policy review) or where institutional controls are necessary to achieve protectiveness (statutory review). Since the management of migration portion of the remedy will require more than five years to complete, and groundwater and land-use restrictions are necessary, a review will be conducted within five years after commencement of this remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

David McIntyre
Acting

9/30/98

Patricia L. Meaney, Director
Office of Site Remediation and Restoration
US EPA - Region 1

Date

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FLETCHER'S PAINT WORKS AND STORAGE FACILITY SUPERFUND SITE
ROD DECISION SUMMARY
September 1998

I. SITE NAME, LOCATION AND DESCRIPTION

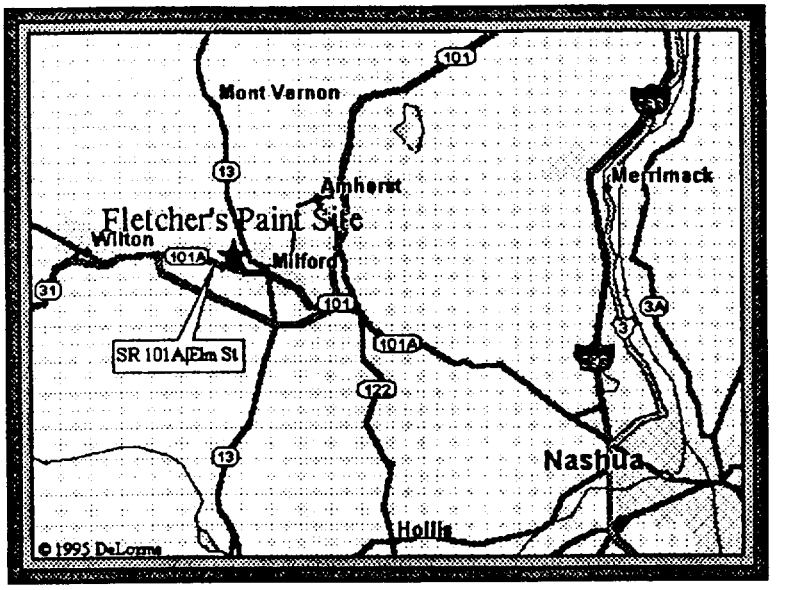

Figure A: Site Location Map
Not to Scale

The Fletcher's Paint Works and Storage Facility Superfund Site consists of approximately 12 acres of land in the town of Milford, Hillsborough County, New Hampshire. The Site is divided into two operable units. The first operable unit, which is the subject of this Record of Decision (ROD), specifically consists of areas referred to as the Elm Street Site, the Mill Street Site and the drainage ditch as well as the plume of groundwater contamination that exists from the Mill Street site to the Souhegan River (Referred to as the "Site"). The second operable unit consists of the Keyes Municipal Well Field and the Souhegan River, both of which will be the subject of a future Record of Decision. A more complete description of the Site can be found in Section 1, pages 1 through 9 of the Remedial Investigation Report.

A. General Site Description and Land Use

The Fletcher's Paint Site is located in a residential and light commercial/industrial area in Milford, within the Souhegan River Valley, immediately west of the town center (See Figure A). The First Operable Unit of the Fletcher's Paint Site is comprised of three general areas: (1) Fletcher's Paint Works, located at 39 Elm Street, and referred to as the "Elm Street Site"; (2) the former Fletcher's Paint Storage Facility on the northern side of Mill Street, immediately west of the Cottage Street intersection, referred to as the "Mill Street Site"; and (3) the drainage ditch/culvert system that flows northward from the Mill Street Pond, along the Hampshire Paper

Original in Color

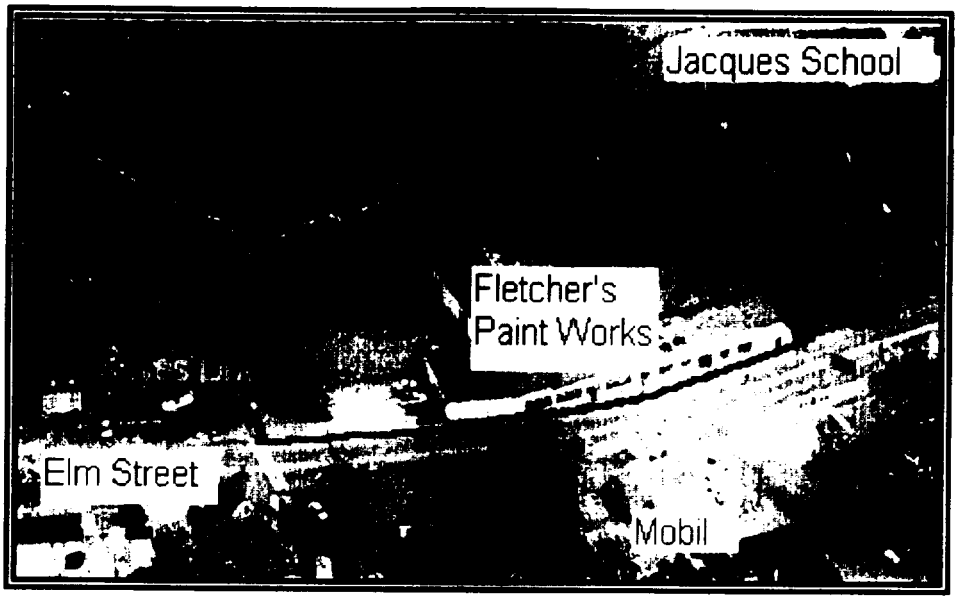

Figure B: Fletcher's Paint Elm Street Site

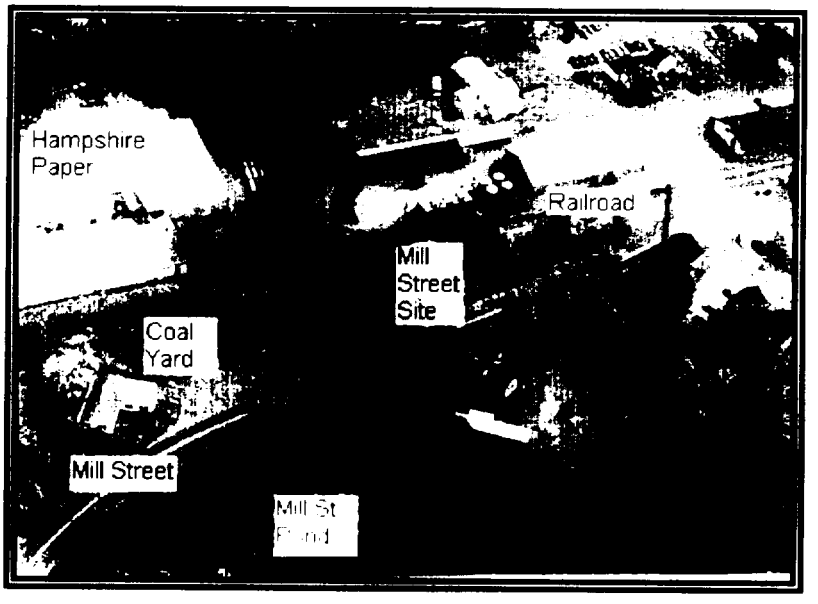

Figure C: Fletcher's Mill Street Site

Company property to Draper Mobil property, where it then flows beneath Elm Street and the Elm Street site, and discharges into the Souhegan River. All three areas of the Site are located within 700 feet of each other. See Figure 1.

The Elm Street Site

The Elm Street Site occupies approximately 70,600 square feet and is situated along the southern bank of the Souhegan River (See Figure B). The property is characterized by a single story brick and cinder block building (approximately 24,500 sq. ft.), situated in the southeast third of the property. The brick portions of the building were built in the 1800's. The cinder block addition was built in the 1970's, when Fletcher's Paint moved the manufacturing operations from the front eastern portion of the brick building to the now larger addition. The majority of the Elm Street site is located within the 100-year flood plain of the Souhegan River. Elm Street (also called Route 101A) borders the site to the south and an old cemetery borders the Elm Street site to the east.

A total of 5 underground storage tanks exist on the Elm Street site, including two tanks beneath the main parking area, two tanks beneath the sidewalk in front of the Fletcher building and a single tank that is centrally located along the bank of the Souhegan River. The tanks, located beneath the parking area, stored VMP Naptha and Mineral Spirits for the paint operations. The single tank on the river bank was installed as part of the Fletcher's Paint Spill Prevention Control and Containment Plan and was used to collect rainwater from the property. The contents of the two tanks under the sidewalk are unknown. The tanks could possibly have been used to store heating oil or paint operation solutions, as they are located in front of the part of the building which housed the manufacturing of the paint before the addition was built.

Five discharge pipes extend out from the banks of the site, discharging to the Souhegan River. These pipes are outlets for the town storm drainage system and for runoff from the Fletcher building. A formerly used process water supply well is located in the northwest corner of the building.

The Mill Street Site

The Mill Street site is an approximately 10,000-square-foot parcel located on Mill Street, 700 feet south of the Elm Street site. (See Figure C) This property housed grain elevators and a grist mill. The Fletcher's Paint Site stored paint related materials in two buildings which were located on the property. One building was destroyed by fire and the other storage building was demolished by the EPA during a 1993 removal action.

Residential areas are located south and west of the site. Commercial areas are located to the north, east and west of the site. A railroad right-of-way borders the Mill Street site to the north, and is used to transport propane and gravel and other materials into and out of Milford. The

Mill Street Pond is located approximately 250 feet southwest of the site.

The Drainage Ditch/ Culvert System

The drainage ditch/culvert system extends from the Mill Street Pond to the Souhegan River. The flow is carried under Mill Street from the pond, under the Draper Energy Coal Yard, along the Hampshire Paper Company property, where it enters a culvert system behind the Mobil station. The culvert channels the flow under Cottage Street and Elm Street, then under the Elm Street site, where it discharges to the Souhegan River.

Keyes Field and Souhegan River

A 10 acre municipal recreation area, called Keyes Field, is located along Keyes Drive, and is the subject of a second operable unit at the Site. Keyes Drive encompasses the western portion of the Elm Street Site. The Keyes Field consists of tennis and basketball courts, ball fields, a playground, and a community swimming pool. The pool and playground areas are used heavily by children of all ages. The ball fields and tennis courts are also used by local sport leagues and high school extracurricular sports.

The Souhegan River runs adjacent to the Elm Street Site and the Keyes Field and is used for recreational swimming and fishing.

B. Geologic Characteristics

Overburden

Overburden deposits in the study area consist primarily of glacial outwash deposits, composed of stratified fine to coarse sand and gravel, underlain by glacial till. The stratified sands and gravels have a minimal content of fine materials, i.e., silt and clay, and are generally noncohesive. The glacial outwash deposits, commonly called "stratified drift," form the highest yield component of the overburden aquifer in the site area. These deposits are consistently underlain by the upper till, characterized by a matrix of olive gray fine sand. The upper till ranges in thickness from 0 to 35 feet and is found in most cases to overlie a slightly more compact till. The lower till is approximately 2 to 5 feet in thickness, and contains a higher percentage of silt and clay along with angular rock fragments.

In addition to the natural deposits identified above, surface fill is prevalent in the study area. At the Elm Street site, various fill materials have extended the property over time, pushing back the Souhegan River from its former position adjacent to Elm Street, to its current position several hundred yards away from Elm Street. The parking area and a portion of the former manufacturing facility at the Elm Street site is situated on top of an old municipal burning dump, which operated from 1927 until 1945. The dump material typically consists of approximately 10 feet of decayed wood, brick fragments, broken glass, oxidized metal, and slag in an ash-like matrix. Additional sand and gravel fill overlies the burning dump materials.

A zone of boulders was identified beneath portions of the Mill Street site that may represent the interface between backfill and native materials. This boulder zone occurred at an approximate depth of 10 feet and was not detected anywhere else in the study area.

The thickness of overburden deposits changes greatly over the study area, varying with bedrock topography. From the Mill Street site, extending north along the eastern side of the drainage ditch, overburden is generally 20 feet thick. Overburden thickness on the eastern side of the drainage ditch is between 50 and 75 feet. Overburden is 60 to 70 feet thick below the Keyes Park and on the north side of the Souhegan River.

Soil

A number of soil types characterize the ground surface within the Fletcher's Paint Site study area. The primary soil units are excessively drained, rapidly permeable and very rapidly permeable soils with very low available water capacity.

Bedrock

The Fletcher's Paint Site is underlain by bedrock which occurs at depths between approximately twenty and seventy feet below ground in the study area. It is competent bedrock with little weathering, having a thin (less than one foot) layer of weathered rock at the bedrock surface and few high-angle fractures. The bedrock surface includes an area of high elevations in the vicinity of the Mill Street and Elm Street sites and an area of low elevations extending to the west from the vicinity of the nursing home to Keyes Park. A relatively steep bedrock slope separates these two areas.

C. Hydrogeologic Characteristics

The Milford area is characterized by three unconfined aquifers which provide the majority of the area's municipal water supply needs. These aquifers, composed primarily of stratified sand and gravel, are generally oriented west to east, parallel to the Souhegan River and Great Brook.

In addition to these unconfined overburden aquifers, there are fractured bedrock aquifers. Both bedrock wells and overburden wells provide domestic water supplies in the Milford area.

The Fletcher's Paint Site study area is situated along the southeastern extent of the Milford-Souhegan Aquifer. Depth to ground water across the site varies from approximately four feet below the ground surface near Mill Street Pond to approximately twenty feet at the Elm Street site and twelve feet at Keyes Park. The saturated thickness also varies across the study area from approximately ten feet near the Mill Street site to twenty feet beneath the Elm Street site and fifty-five feet beneath the Keyes Park.

The base of the Milford-Souhegan Aquifer is locally defined by a discontinuous veneer of clayey silt with gravel (lower glacial till) that ranges in thickness from zero to four feet. At locations where the lower glacial till is discontinuous, such as the eastern half of the Elm Street site and the Mill Street site, direct hydraulic communication exists between the bedrock and overburden aquifers. Some hydraulic communication may also exist in areas where the lower glacial till is present.

Generally ground water flow is toward the Souhegan River and flows in a north-northwest direction from the Mill Street site and a north-northeast direction across the Elm Street site and Keyes Park. This lateral flow is consistent with regional interpretations that suggest the river is the primary ground water discharge point associated with this part of the Milford-Souhegan Aquifer.

Vertical flow in both the overburden and bedrock aquifers is generally upward in the immediate vicinity of the Souhegan River and prevails downward in the vicinity of the Mill Street Site.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Response History

Fletcher's Paint was in operation from approximately 1948 until 1991 as a manufacturer and retail distributor of paints and stains for mostly residential uses. The paints were primarily water-based latex paints and organic-based solvent paints. The company's annual production was 25,000 to 35,000 gallons. Following the closure of the Fletcher's Paint Works, a consignment shop has operated in the front brick portion of the building. Parking for this consignment shop is limited as a result of the 1991 fence installation. The Mill Street site sits vacant following the 1993 shed demolition removal action.

Land use at the Elm Street site prior to 1949 included agricultural farming in the 1800's (as part of the Crosby Farm), hide storage for the nearby tannery, a turn of the century blacksmith and carriage painting business, an armory (1913 to 1926), the town burning dump (1929 to 1947), and an automotive dealership (1920 to 1949). The Mill Street site contained two sheds that were used by Fletcher Paint as warehouses for bulk paint pigments for over twenty-five years. Previously, they had been used for grain storage. One of the buildings was reportedly destroyed by fire, prior to EPA's involvement at the site.

On February 1, 1983, the New Hampshire Office of Waste Management (NHOWM) conducted an inspection of the Fletcher Paint Works. The facility was classified as a waste generator and was noted to be out of compliance with the New Hampshire Department of Public Health regulations. The facility never returned the notification forms requested. However, no further action was taken and, upon a follow-up inspection on July 7, 1985, NHOWM determined that the

Paint Works facility was no longer considered a generator of hazardous waste.

The 1984 detection of volatile organic compounds (VOCs) in the nearby Keyes Well by the New Hampshire Department of Environmental Services ("NHDES"), formerly known as the New Hampshire Water Supply and Pollution Control Commission, triggered the removal of the Keyes Well from service and prompted a series of investigative activities to determine the contaminant source. During a Preliminary Assessment conducted in 1985, EPA inspected the facility and found in the Fletcher's Paint Works parking lot approximately fifty drums stacked on their sides several drums high. On the southeastern edge of the parking lot, approximately 150 drums containing alkyl resins were adjacent to the building. The majority of these drums were bulging, rusty, and dented, and the ground beneath the drums was stained. A third area of drum storage located near the southeast edge of the building contained approximately fifty drums of inorganic pigmenting agents used in the manufacture of paint. In addition, twenty to thirty drums were found stacked outside the storage building on Mill Street. Most of those drums were open, empty, and stored on their side without benefit of a liner or other containment system.

From May, 1988, to October, 1988, EPA conducted removal activities at both the Elm Street and Mill Street locations. At Elm Street, the main activities performed by EPA were the staging, sampling, analysis and disposal of 863 drums of hazardous substances and the covering of the contaminated soils of the parking lot with geotextile fabric and fill. At Mill Street, EPA covered contaminated soils, inventoried bags of pigment in the storage shed, and disposed of 12 bags of asbestos contained in the shed. The Fletcher Paint Works and Storage Facility Superfund Site was proposed for inclusion on the National Priorities List on June 24, 1988; and finalized on March 30, 1989. In November and December of 1991, EPA conducted a second removal, installing a fence at the Elm Street portion of the Site and removing laboratory containers found in the building on that portion of the Site.

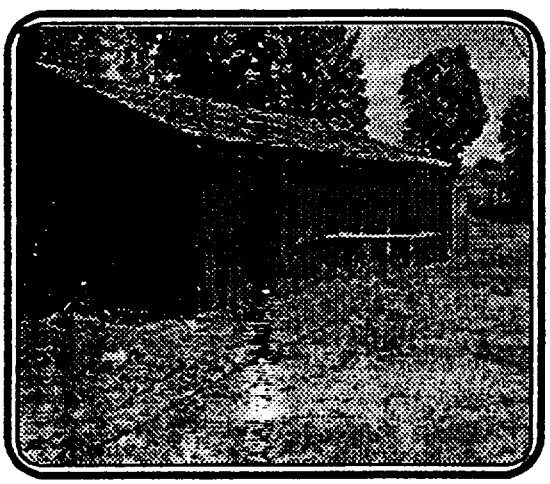

Figure D: Mill Street Storage Shed, prior to demolition in 1993

A third Removal Action was completed by EPA at the Mill Street and Elm Street sites during the summer of 1993. The Removal Action included characterization and disposal of wastes found in the Elm Street and Mill Street buildings, demolition and disposal of the Mill Street building(see Figure D), and repair of the caps on both the Mill Street and Elm Street properties.

Approximately 500 bags of dry paint pigments, 100 cardboard drums of dry resins, and numerous various-sized containers of unknown materials were found in the Mill Street building. Approximately 327 drums of hazardous

substances, 750 bags of paint pigments 10 bags of friable asbestos and 2,500 small containers of miscellaneous substances were removed from the Elm Street building. A total of 512 drums and 99 wrangler boxes were disposed of during this action. The materials were categorized into 26 different waste streams including oxidizers, peroxides, cyanides, lead, chlorinated organics, acids, organic solids, inorganic solids and PCBs.

The Elm Street cap was repaired, and re-graded with 64 tons of crushed stone and 132 tons of 3/4 inch washed stone. A geotextile liner was placed at the Mill Street site where the shed was formerly located, and 3 to 6 inches of sand fill and 6 to 8 inches of topsoil were placed over the liner. The Mill Street site was then hydro-seeded.

In April of 1996 EPA completed a Remedial Investigation/Feasibility Study (RI/FS), which began in the summer of 1990. The RI and other studies reveal that soils, sediments, surface waters and groundwater are contaminated with volatile and semi-volatile organic compounds, metals, PCBs, and pesticides. In addition, the studies show that the Souhegan River has surface water and sediment contamination, as well as potential impact to certain fish and biota within the river as a result of the contamination.

In December, 1995, EPA Region I made the decision to split the Keyes Well Field and the Souhegan River into a second operable unit in order to conduct further investigations of the contamination at those locations. In a future RI/FS, EPA will complete the investigations into the groundwater contamination in the Keyes Field area and conduct a feasibility study on alternatives to address the contamination in the River. An April 1998 Ecological Risk Assessment reported the contamination of the sediments, surface water and biota in the river and concluded that there is a chronic health risk to the biota in the river as a result of the contaminated sediments. As part of Operable Unit Two, EPA will determine whether the Keyes Field and Souhegan River require further remedial action.

A more detailed description of the Site history can be found in the Remedial Investigation Report in Section 1, Table 1-1 and in pages 5 through 8.

B. Enforcement History

In 1990 the EPA referred a complaint to the Department of Justice seeking recovery of costs incurred in the 1988 and 1991 removals from three potentially responsible parties (PRPs). Settlement of the complaint has been reached.

In the summer of 1995, General Electric (GE), a potentially responsible party at the Site, conducted a fourth removal. Pursuant to a Unilateral Administrative Order issued on July 13, 1995, under Section 106 of CERCLA, GE removed PCB contaminated soil from surface soil, under lawns, and on the dirt driveways of three residential properties across from the Mill Street

site to protect residents from the risks of direct exposure to PCBs. Many of the residents chose to be included in a voluntary relocation program during this action. A 10 foot wide paved apron was added to the Mill Street site at the end of the action to prevent further degradation and wear of the edge of the cap and Mill Street itself was re-paved to direct surface water runoff toward the Fletcher Paint property and away from the residences.

In August of 1996, GE performed a voluntary soil cleanup of the small piece of land east of, and adjacent to the Fletcher Paint building. This small piece of land was found to have low levels of PCB contamination. General Electric voluntarily removed the contaminated soils as well as additional soil to enable a Korean War Memorial to be built on that location.

On October 11, 1996, EPA issued General Notice to four remaining PRPs, which include the Town of Milford.

On July 10, 1998 a proposed Consent Decree in United States v. The Town of Milford, No. 98-430-B (D.N.H.) was lodged with the United Stated District Court for the District of New Hampshire. Subsequently a notice was published in the Federal Register (Vol 63 No. 142) on Friday July 24, 1998, opening the Proposed Consent Decree for comment for thirty (30) days from publication. In this action, the United States sought, pursuant to Section 107 (a) of CERCLA, 42 U.S.C. 9607 (a), recovery of costs concerning the First Operable Unit of the Fletcher's Paint Site, and the subject of this Record of Decision. The Town of Milford currently owns a portion the site (the Keyes Drive), and previously has operated a burning dump on another portion of the site. In the Proposed Consent Decree, the Town of Milford, New Hampshire, agrees to pay the United States, $62,139.00, for past and future response costs incurred for the First Operable Unit at the Site; to provide various in-kind services, including replacement piping material, which is valued at $ 16,675.00, and perform future routine maintenance on the Site; to provide access to portions of the Site owned or controlled by the Town of Milford; and to covenant not to sue the United States. This settlement does not address any potential liability for the Second Operable Unit at the Site.

III. COMMUNITY PARTICIPATION

Throughout the Site's history, community interest and involvement has been high. EPA has kept the community and other interested parties appraised of the Site activities through six informational public meetings, numerous personal contacts, nine fact sheets, and press releases.

During February, 1993, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed and involved in activities during remedial activities. On September 25, 1991, EPA held an informational meeting at the Hampshire Hill Sports & Fitness Club to describe the plans for the Remedial Investigation and

Feasibility Study. On August 17, 1994 EPA held an informational meeting at the Hampshire Hill Sports & Fitness Club to discuss the results of the Remedial Investigation.

In the fall of 1995 EPA held an informational public meeting at the Town Hall to discuss potential community related impacts from the various cleanup alternatives that were under review as part of the Feasibility Study ("FS"). As a result of this meeting, which was well attended, EPA met with specific public and business representatives to further discuss and resolve some of the potential community impacts.

In April of 1996 EPA released the Feasibility Study report. In June 10 1996 EPA held a public informational meeting to reiterate the results of the Remedial Investigation and present the various cleanup alternatives for the site. At the request of the Milford Selectmen, EPA specifically did not release the Proposed Plan concurrently with the FS, to allow the Town to review and comment on the potential alternatives prior to EPA finalizing the Proposed Plan.

In December, 1996, EPA made the Administrative Record available for public review at EPA's offices in Boston and at the Wadleigh Public Library in Milford, New Hampshire. EPA published a notice and brief analysis of the Proposed Plan in the Milford Cabinet on January 8, 1997, and made the Proposed Plan available to the public at the Wadleigh Public Library.

On January 14, 1997, EPA held an informational meeting to discuss the results of the Remedial Investigation and the cleanup alternatives presented in the Feasibility Study and to present the Agency's Proposed Plan. From January 14 through April 21, 1997, the Agency held a ninety day public comment period (an extension of sixty days was granted in addition to the initial thirty-day comment period) to accept public comment on the alternatives presented in the FS and the Proposed Plan and on any other documents previously released to the public. On January 29, 1997, the Agency held a public hearing to discuss the Proposed Plan and to accept any oral comments. A transcript of this meeting and a summary of all comments and the Agency's response to comments are included in the Responsiveness Summary in Appendix B..

IV. SCOPE AND ROLE OF OPERABLE UNIT ONE RESPONSE ACTION

As discussed in Section II above, several removal actions have been performed at the Site to protect human health and the environment, to remove hazardous substances and to stabilize the contaminated soils. The remedial action authorized by this ROD addresses the remaining contaminated soil and groundwater for Operable Unit One. The selected remedy was developed by combining components of different source control and management of migration alternatives to obtain a comprehensive approach for remediation. In summary, the remedy provides for source control through soil excavation with on-site treatment using an ex-situ thermal desorption technology, replacement of the treated soils, and installation of a soil cover over the Elm Street

Site as well as an asphalt over portions of the both Elm Street and Mill Street sites. Management of migration will be achieved through monitored natural attenuation and the use of institutional controls. The implementation of the remedy for Operable Unit 1 can occur independently of future investigations and remedial actions relating to Operable Unit 2, the Keyes Well Field and the Souhegan River.

This remedial action will address the following principal threats to human health and the environment posed by the Site: current and future human exposure to contaminated surface soils through dermal contact and incidental ingestion, future human exposure to contaminated subsurface soils through dermal contact and incidental ingestion, as well as the future ingestion of contaminated ground water; and prevents the leaching of and continued migration of contaminants through the soils into the groundwater at levels that would exceed drinking water standards.

V. SUMMARY OF SITE CHARACTERISTICS

Significant soil, surface water, sediment and groundwater contamination is present at the Fletcher's Paint Site. Major sources of the soil and groundwater contamination were eliminated when drums were removed during the EPA's 1988 Removal Action. Temporary caps were also placed at the Mill Street and Elm Street sites during this time period since high levels of residual contamination remained in the soil as a result of the historical surface spills and improper handling and storage of drums on the properties.

Groundwater contamination is present at both the Elm Street and Mill Street Sites. Groundwater at the Mill Street Site exhibits the highest levels of groundwater contamination found at the Site and is the source area for a large plume of groundwater contamination which extends from Mill Street to the Souhegan River.

At the Elm Street Site, a significant area of groundwater contamination exists as a result of leaching from a hot spot of polyurethane resins within the subsurface. Groundwater flow is generally toward the Souhegan River and flows in a north-northwest direction from the Mill Street Site and a north-northeast direction across the Elm Street Site and Keyes Field. The lateral flow is consistent with regional interpretations that suggest that the river is the primary groundwater discharge point associated with the Milford-Souhegan Aquifer. A small portion of the groundwater flow at the Mill Street Site was observed to flow Southwest, toward the Mill Street Pond. Vertical gradients are generally downward in the area of the Mill Street site and invert to an upward direction as the Souhegan River is approached.

Chapter 2 of the Feasibility Study contains an overview of the Remedial Investigation. The Remedial Investigation was carried out in two phases, the first phase (Phase 1A) was conducted between October 1991 and February 1992; and the second phase (Phase 1B) were conducted

between October 1993 and January 1994. The significant findings of the Remedial Investigation are summarized below.

A. Fletcher's Paint Elm Street Site

Soil

The Elm Street portion of the Fletcher's Paint Works was the location for the manufacturing and operation of the paint business, including the storage of the materials in drums, as well as the retail outlet. The Elm Street site is also the location of the former town burning dump. PCBs, while not extensively used in the paint operations, were identified as the primary contaminant at the Site. The Paint Works used and resold some of the "scrap pyranol" (which contained various mixtures of PCBs, trichlorobenzene and trichloroethylene) for other non-paint related purposes such as a dust suppressant, heating oil and as a compound for the roofing cement industry. The Fletcher's Paint Works also used the scrap pyranol to suppress the dust at the Elm Street facility.

The RI investigations revealed that in addition to overall surficial PCB contamination in the soils as a result of the dust suppression, temporary drum storage and related activities at the Site, the highest and deepest concentrations of PCB contamination directly correspond to former drum storage areas of the site. To a lesser extent, other hazardous materials found at the site during the RI included volatile organic compounds (VOCs) such as xylenes, ethylbenzenes and toluene, metals such as lead, chromium, antimony and barium, and semivolatile organic compounds (SVOCs) such as phthalates and polycyclic aromatic hydrocarbons (PAHs), all relating most likely to the paint operations. In the deeper materials and debris, that comprised of the former burning dump, metals and PAHs (formed as a result of incomplete combustion) were found. (See Figures 2 through 6).

The most prevalent hazardous substance found at the site was PCBs. Four different PCB Arochlors were detected in the Contract Lab Program ("CLP") analysis of soil and groundwater samples collected from the Elm Street site: Arochlors 1242, 1248, 1254 and 1260. The most frequently identified mixture at the Elm street site were the Arochlors 1242 and 1248 in the Phase 1A investigation and 1248 and 1254 in the Phase 1B investigation; Arochlor 1260 was only identified once. Arochlors are industrial mixtures of specific PCB congeners. Arochlor compounds are thermally and chemically stable compounds with excellent dielectric properties. They have been used in nominally closed systems such as heat transfer liquids, hydraulic fluids, lubricants and in open ended systems such as surface coatings, inks, adhesives, pesticides, extenders and for micro encapsulation of dyes of carbonless paper (Merck & Co., 1989). Trichloroethylene (TCE) and 1,2,4-Trichlorobenzene (TCB) are compounds typically used with the PCB industrial Arochlor mixtures, as a cleaning solvent and carrier fluid. In general, where high levels of PCBs are found at the site, TCE and TCB are also found. (See Figure 7).

In general three major areas of contamination were identified on the Elm Street property: 1) the EB-15 area, which is just west of the warehouse portion of the Paint Works, and behind the older brick portion 2) EB-03 area, adjacent to the river bank, and 3) the EB-02 /EB-17 area west and north of the Fletcher's Paint building.

- The area in the vicinity of location EB-15, (See Figure 6), just west of the Elm Street building, and centrally located on the Elm Street Site, represents the major area of surface contamination at the Elm Street site. This is one area that was used to store drums during the years of paint operations. The near-surface sample (one to two and one-half feet) from this location exhibited the highest concentrations of TCE (50 ug/kg), 1,2,4-TCB (8,800 ug/kg), 4-nitrophenol (860 ug/kg), and percent level PCBs (14,000 mg/kg -total PCBs by field data and 5,000 mg/kg 1248 PCB by CLP). PCB concentrations at this location generally decreased with depth, however PCBs were found at depth, with field data indicating 940 mg/kg PCBs detected in the soils from 9 to 11 feet below the surface and 640 mg/kg PCBs detected in the soils 19 to 20.5 feet below grade, and essentially at the water table. Just below the water table, the field data indicated that the PCB concentrations dropped to 11 mg/kg at 24 feet below grade.

  Subsurface soil sampling at location EB-20A, located under the Fletcher's Paint warehouse addition, indicated that concentrations of PCBs (13mg/kg PCB 1248) were detected from 26 to 30 feet below grade. At 12 to 14 feet, 2.6 mg/kg PCB 1248 was detected. The near surface sample, 0 to 4 feet, at EB-20A contained 6.2 mg/kg PCBs 1248 and 1254. Soil samples were obtained at EB-20A by drilling through the concrete floor of the warehouse portion of the paint facility. The area that currently houses the warehouse portion of the paint facility (and has since it was built in the mid 1970's) was formerly the area of the driveway and drum storage location. Also detected at EB-20A was TCE at 46 ug/kg from 12 to 14 feet and 3 ug/kg at 26 to 30 feet. This location is also close to the location of the culvert system located at similar depths within the Elm Street site, and beneath the former Fletcher's Paint Works building.

- At EB-03, the subsurface soil sample collected at eleven to thirteen feet and in close proximity to a resin-like material, exhibited concentrations of volatile aromatics of 1.9 mg/kg toluene, 21mg/kg ethylbenzene, and 20 mg/kg xylenes. PCB concentrations at this location were 6,700 mg/kg and 7,900 mg/kg (dup) 1242 from 9 to 10.5 feet. PCBs at a concentration of 1,900 mg/kg were detected from 11 to 13 feet. The vertical extent of the measured PCB contamination in this area reaches a maximum depth of 46.5 feet, with the highest concentrations found in the top 15 feet. All concentrations below 25 feet were below 1 mg/kg PCB. At the EB-04 location, northwest of EB-03, lower levels of PCBs were found at depths correlating to the contamination found at depth at EB-03.

  A yellowish crystalline material and a brownish, viscous, resin-like substance were

encountered during the Phase 1A drilling at both the EB-03A and EB-03B locations. These materials extend from a depth of approximately 5 feet to 11 feet below the surface. These materials were analyzed using Fourier Transform Infrared Spectoscopy (FTIR) to determine the overall chemical composition of the materials. The FTIR spectrum of the yellowish crystalline material was identified as a urethane or polyurethane; the spectrum for the brownish, viscous material was identified as a polyamide resin.

Also at the EB-03 location, Aroclor 1248 and the higher molecular weight PAHs were detected in the soil sample collected at seven to nine feet, in materials determined to be consistent with the burning dump debris. The materials that were used to define the extent of the burning dump included ash, burnt wood, broken glass, metal fragments and ceramic fragments. The thickness of the former burning dump materials varies, ranging from 2 feet at EB-22 to 8 feet at EB-17.

PAH contamination found at the Site indicated that two different types of PAH contamination were observed, contamination due to combustion by-products and contamination due to petroleum products and/or paint related manufacturing chemicals. The majority of the PAH contamination found at the site were the high molecular weight, three and four ring PAHs and are associated with incomplete combustion products. The PAH contamination relating to paint operations were found in near surface samples and included the two ring PAHs such as naphthalene, phenols and alkyl-substituted phenols, and phthalates.

- The subsurface soils from EB-17, located behind the Elm Street building and, to a lesser extent, soils from EB-02A, showed elevated concentrations of volatile aromatics, PAHs, phthalates, pesticides, and PCBs. The contamination at this location was observed in the deeper soils (twenty-seven to twenty-nine feet), which corresponds with possible burning dump debris, however, additional sources for this contamination include debris within the overlying fill, surficial releases of contamination and migration from off-site sources through the drainage ditch/culvert system into surrounding site soils.

- Inorganics were observed in soils from EB-18B (seventeen to eighteen and one-half feet); Barium, chromium, lead, and zinc, as well as several other inorganic elements, were observed at elevated (above background) concentrations in this sample. The locations and depths of the elevated concentrations were found in an area consistent with the mapped location of the former burning dump. However, these metals, as well as many others, are extensively used in paint formulations. Lower concentrations of the inorganics mentioned above were observed in surface and near-surface soils in the vicinity of EB-02A and EB-15, and in deep soils from EB-02A and B and nearby EB-17. This area of contamination is not well defined and could be associated with the numerous former storage areas at the site.

Groundwater

- At the Elm Street site, ground water appears to be most contaminated in the area of the Site along the river, at monitoring well ("MW") 03B, which is screened from eleven to twenty-one feet. Data from this well indicate extremely elevated concentrations of volatile aromatic compounds (55,000 ug/l xylenes, 4,100 ug/l toluene and 8,400 ug/l ethylbenzene).

  Also at MW-03B, total phenols at 2,927 ug/l and 5,987 ug/l were found during Phase 1B. The high phenols in the groundwater is believed to be associated with the paint-related polyurethane and polyamide paint resins that were found at depth at EB-03.

- PCBs were found in the groundwater at MW-04C, MW-02B and MW-20A during Phase 1B at concentrations of 0.78 ug/l, 0.74 ug/l, and 1.7 ug/l, respectively.

- Low levels of TCE contamination (5-84ug/l) were found in the groundwater monitoring well at the Elm Street Site. The location and depths of the TCE contamination indicate that the contamination is not likely from surficial releases, but rather from the TCE contamination at the Mill Street Site, which has migrated into the Elm Street Site.

- Hydraulically upgradient, and immediately South of the Elm Street site, VOC and PAH contamination was detected in the groundwater monitoring wells at both the Mobil and Gulf Service stations. These gasoline stations have had prior releases, which have impacted their properties.

Figures 2 through 6, and Figures 8 and 9, show the PCB contamination at the Fletcher's Elm Street property, the geology of the site with depth and the extent of TCE groundwater contamination found during the RI. Table 1 shows the field data collected and analyzed for PCBs for the Elm Street soil borings.

B. Fletcher's Paint Mill Street Site

Soil

At the Mill Street site, contamination was detected in surface soils, subsurface soils, and groundwater. The major contaminants include chlorinated VOCs (primarily TCE), volatile aromatic hydrocarbons (primarily xylenes), PAHs, PCBs, TCB and metals (primarily lead). Surface soil and near surface soil contamination consists primarily of PCBs and to a lesser extent TCB, PAHs and metals. The area just east of the former storage shed, where the highest concentrations of contaminants, and especially PCBs, were found, is known to have been a former drum storage and staging area, as well as an area where contents of drums were

transferred from one drum to another. PCB contamination was also observed in building surface samples collected from the east wall of the wooden storage shed, immediately adjacent to the known drum storage area.

- The area in the vicinity of EB-21C, EB-12 and EB-07A, located on the western portion of the Mill Street Site, represents the major area of near surface contamination at the Mill Street site. The vast majority of the PCBs found at the Mill Street Site are situated within the top four feet. While PCB concentrations decrease rapidly with depth across the site, PCBs were found at depths to the water and below during the field studies. Data from EB-12 and EB-21C indicate that PCBs have migrated through the unsaturated zone into the saturated zone, though PCB concentrations found continue to decrease with depth. Table 2 shows the estimated mass of PCBs at the Site. PCBs are considered a dense non-aqueous phase liquid (DNAPL), characterized as highly viscous liquids, compared to other, less viscous DNAPL chemicals such as the chlorinated solvents TCE and PCE. The primary reason believed for the infiltration of the PCBs at the Mill Street Site, was the initial surficial release of PCBs, most likely combined with other compounds, as a liquid material. This material, being dense, but highly viscous, spread laterally and vertically through the unsaturated the saturated zones leaving residual contamination. The PCBs would have continued to penetrate in this fashion until the volume and mass of the material was no longer sufficient to overcome the gradient required for further, deeper penetration into the subsurface. While the high concentrations of PCBs found in the shallow surface soils are indicative of residual DNAPL, free phase DNAPL was never identified in any soil sampling or exploratory boring event during the RI.

- The near-surface sample (one to three feet) from the EB-12 location exhibited very high levels of PCBs, found at 26,700 mg/kg (CLP) and 110,000 mg/kg (field data). Arochlors 1242 and 1248 were the primary arochlors found at this location. Other samples of contaminated soil, taken from near surface soils from this general location for various treatability studies, indicated PCB concentrations of approximately 88,000 mg/kg (GE treatability study - Maxymillion Technologies - ex-situ thermal desorption), 35,5000 mg/kg (EPA treatability study, IT technologies, ex-situ thermal desorption) and 60,000 mg/kg (EPA treatability study - CF Systems, solvent extraction). TCE, xylenes and trichlorobenzene were also found at high levels in the near surface soils at this location.

- 1,2,4-TCB detected in EB-21C at 64 and 69 mg/kg (dup) from 0 to 4 feet, was the highest observed during this investigation at the Fletcher's Paint Site. The concentrations generally appeared to decrease with depth. Elevated PCB concentrations in this area, 9,400 mg/kg and 9,600 mg/kg (dup) Arochlor 1248 from 0 to 4 feet, 780 mg/kg from 8 to 10 feet and 190 mg/kg from 12 to 14 feet, also suggests that the majority of the PCB contamination exists in the upper soils with a trend toward decreasing lateral and vertical concentrations.

- PAHs were detected in the near-surface samples, SS-01, SS-02, SS-03, SS-12, and S-09. At SS-01, SS-02, and SS-03, PAH contamination generally decreased with depth. The higher molecular weight PAH contamination appears to be from nearby asphalt surfaces.

- While most of the observed concentrations of inorganics in soil samples collected during the Mill Street investigation were consistent with background levels, elevated levels of lead and barium were found in soil samples from underneath the former storage shed at the Mill Street site during the 1993 removal action, and subsequently were removed. Paint pigment removed from the storage shed during the 1993 removal action were found to contain high levels of lead, chromium, antimony, and iron oxides.

Groundwater

A major source of groundwater contamination is prevalent at the Mill Street site. Groundwater contamination at the Mill Street site includes TCE, TCB, PCBs and a flocculent material, all of which were all identified at extremely high concentrations.

- There are 4 overburden monitoring wells associated with the Mill Street site, of which one, MW-07A is the only well located on the Fletcher's property itself. One shallow bedrock monitoring well, MW-21C, is also located within the suspected source area of the Mill Street site. The highest concentration detected at the Mill Street site were in monitoring well, MW-21C, a shallow bedrock well, where 5,700 ug/l TCE, 270 ug/l PCB and 140 ug/l TCB were detected.

- GE's consultant, ESE, conducted additional sampling in 1995 of both MW-21C and MW-07A using an even lower flow volume per minute than was used in the RI, Phase 1B investigations, to determine the nature of the contaminant in the mobile phase. Laboratory analysis was performed on raw water samples collected from each location, as well as on aliquots of each sample that were filtered or centrifuged prior to analysis. While not consistent with the EPA protocol for low flow sampling and analysis, the rationale behind the sampling and analysis was that for PCBs, centrifugation and filtration would be expected to remove colloids and particles too large to migrate while at the same time provide representative samples which would obtain mobile PCBs (those dissolved in the water as well as those sorbed to mobile colloidal particles).

  The results of the 1995, GE sampling round for MW-07A include: 77.8 ug/l PCB (raw water), 58.9 ug/l PCB (centrifuged water), and 35.0 ug/l PCB (filtered water). The results for MW21C include: 229 ug/l PCB (raw water), 182 ug/l PCB (centrifuged water) and 131 ug/l PCB (filtered water).

As stated in ESE's June 1995 Focused Feasibility report prepared on behalf of GE, "The results of the analysis of samples collected at the site [both Elm and Mill Street], with the exception of MW07, concentrations of PCBs in groundwater have decreased from previous sampling results." " Further reductions in concentrations are evident in centrifuges and filtered samples. Based on these results, it is apparent that removal of particulate matter from samples, via centrifuging or filtering, results in a reduction of the concentrations of PCBs, indicating that a portion of the PCBs in the samples may be attributed to PCBs adsorbed onto particulate matter or the filter. A portion of these particles are immobile, and the true dissolved-phase concentration of PCBs is in the range indicated by results for the centrifuged and filtered samples. Concentrations at Mill Street are indicative of site conditions that are different than Elm Street."

- A flocculent-type (precipitate) material was observed in groundwater from MW-07A and MW-21C during the RI investigations. An FTIR analysis of the material from MW-07A indicated the presence of polydimethyl siloxanes, polyvinyl stearate, acrylic and hydrocarbons. These materials are used in paint formulations. The presence of this flocculent material was not observed in either well MW07A or MW21C during the GE/ESE 1995 sampling event. In November of 1997, GE conducted a sampling and analysis of the flocculent material, and reported the findings to the EPA on May 25, 1998. (See Table 3). The collected was divided into a top yellow-tan colored sample and a bottom flocculent sample, since ten minutes after sampling, the flocculent material settled to the bottom of the bailer. The GE report states that "the water was removed from the bottom of the well using a Waterra™ pump and was visually checked for the presence of DNAPL that may have not been picked up by the bailer. There was no evidence of DNAPL in the groundwater. Following purging, the groundwater did not contain suspended material nor was there visual evidence of DNAPL." GE's reported the findings of the analysis as follows:

  Top sample(yellow-tan groundwater): The top sample contained TCE at 72 ug/l, and 46 ug/l PCBs. The report notes that this concentration of PCBs may not be representative of the concentrations of PCBs in the groundwater in the formation, as it may be influences by fine particulate material in the bailer sample which may not have settled out completely.

  Bottom sample (flocculent material): The bottom sample contained 77 ug/l TCE, and 1,780 ug/l PCB. GE reported that the PCBs present on the flocculent material and in the groundwater are Arochlor 1242 and are only slightly altered from the initial chemical composition.

The suspended material in the bottom sample was consistent with the materials found by

the EPA during the RI. The data from this materials (from both GE and EPA's analyses) indicate that the flocculent materials formed as a result of reduced (soluble) iron in the groundwater, in combination with the dense paint related compounds, entered the well and became oxidized by atmospheric oxygen that can diffuse and enter the standing water in the well. Following removal of the flocculent material by purging, no suspended material was observed, demonstrating that if the flocculent material is present in the groundwater around the well, it is not mobile within the formation. The mobility of the flocculent materials within the well screen is limited as a result of low interstitial groundwater velocity relative to the settling velocity of the particles. However, the mobility of these same chemical compounds in the groundwater around the well, which have not yet oxidized to form a precipitated flocculent, is not known.

The flocculent materials contained extremely high PCB concentrations (1,780 ug/l) when compared to the solubility limit for Arochlor 1242 (100 ug/l [Montgomery and Welkom, 1990]). Because of the limited extent of PCB found in the soils at MW07A, where the majority of the contamination is in the top 4 feet, and concentrations fall below 1 mg/kg at the water table, the extremely high PCB concentration in the flocculent material is likely due to the absorption of the PCBs at the surface into the other, paint related materials, which were also likely released as liquids onto the soil surface, and the ultimate migration of those compounds through the subsurface.

Figures 10,11 and 12 show the PCB contamination at the Fletcher's Mill Street Site, the geology of the site with depth. Figures 8 and 9 show the extent of the TCE contamination in the groundwater for the shallow overburden and shallow bedrock wells. Table 4 shows the field data collected and analyzed for PCBs at the Mill Street soil borings.

C. Drainage Ditch/Culvert System

Surface water and sediment related to the Mill Street Pond and drainage ditch/culvert system were collected and analyzed to determine the role this system had in surface transport mechanisms. This system connects the Mill Street Pond to the Souhegan River.

- PCBs were detected in the sediments from the pond, drainage ditch, and culvert system at concentrations ranging from .240 mg/kg to 3.7 mg/kg. Lead and chromium were found in the drainage ditch system, in the area identified as a residential garden. Low levels of PCBs and pesticides were also found within the garden area. The residents using the garden were given the sampling results and future protocols on the proper washing and handling of the vegetables grown in the soils were discussed. The garden, at this time, is no longer used by the residence.

- PAHs were found in the sediments of the Mill Street pond (SED-13) and in the surface soils adjacent to the American Legion parking lot. The concentrations of PAHs decreased significantly with distance from surrounding asphalt surfaces.

- Phenol, and 4-methylphenol were detected in the Mill street Pond sediments and surface waters as well as in the drainage ditch sediment locations. Pentachlorophenol was detected in the Mill Street Pond and also during the groundwater monitoring in well locations, MW08A (1 ug/l), MW08B (2 ug/l) and Res-01 (5 ug/l).

- The presence of high levels of VOCs in the catch basins within the storm drainage culvert system, with no apparent upgradient detections, indicates that a localized petroleum release under investigation by the NHDES was entering the culvert system and discharging downgradient of the system in the Souhegan river. Sampling of the outfall from the culvert system (OF-5) into the river also indicated the presence of VOCs, but at a four fold reduction in concentration. The outfall to the River currently is being monitoring and an absorbent boom is maintained at the outfall to catch any further petroleum release.

D. Souhegan River

The RI included investigations into the nature and extent of contamination of the Souhegan River. Future remedial actions, if any, for the Souhegan River would be included as part of Operable Unit Two, and is not included in this ROD. The surface water and sediment data has been included in this ROD to give a better understanding of the chemical contamination at the Site, its surroundings, and the potential fate and transport of the chemicals found on the properties described as part of this ROD.

Sediments

- Moderately high levels of PCBs (49 mg/kg) were present in the Souhegan River sediments adjacent to the Elm Street site, and concentrations appear to decrease with distance downstream of the site. Sediment samples downstream at the dam were not collected. Deposition from a former Fletcher employees indicates that drums containing PCBs may have fallen into the river, when drums were stored along the banks in the vicinity of EB-03. In addition, a fairly steep slope extends from the Fletcher's property into the river allowing PCB contaminated soils to erode into the river, as is evident by the detection of PCB contamination all along the bank and immediately adjacent sediments.

- Lead and chromium were also found in samples of Souhegan River sediments adjacent to the Elm Street site, with concentrations also decreasing with distance downstream of the site.

- Elevated total xylenes concentrations (11 and 14 mg/kg) were detected in the Souhegan River sediment location SED-11, adjacent to the Elm Street site and the location of the EB03 boring, where the paint related resins and high VOCs were found in both the soils and groundwater.

- The highest concentrations of phenolic compounds (phenol and pentachlorophenol) were detected at SED-09 adjacent to the Elm Street Culvert discharge point. The concentrations at the river location are likely the result of contaminants migrating from the Elm Street site as well as from the Mill Street Pond and drainage ditch.

- Elevated PAH concentrations were detected in river sediments adjacent to the Elm Street site at SED-11 and SED-09. PAH concentrations decrease steadily downstream with distance from the Elm Street site. However, levels of PAHs immediately upgradient of SED-11 (e.g., SED-01) were comparable to the levels adjacent to the Elm Street site. Therefore, the Elm Street site does not appear to be impacting PAH concentrations in the Souhegan River upgradient of the Elm Street Culvert discharge point near SED-09.

Surface Water

- The only surface water sampling location with reported PCB concentrations was SW-03 (0.41 µg/L). This sample was unfiltered and was collected approximately 300 feet downstream of the Elm Street site.

- The only surface water sampling locations with reported lead concentrations were SW-11 and SW-09. The origin of these detected concentrations is likely from the Elm Street site and the Elm Street Culvert.

A complete discussion of site characteristics can be found in the Remedial Investigation Report in Section 4 at pages 1 through 69 and in Section 5 at pages 1 through 57.

VI. SUMMARY OF SITE RISKS

A Final Baseline Human Health Risk Assessment (BHRA), reported in section 6 of the RI (July, 1994), an amended BHRA, reported in Appendix A of the FS (April, 1996), as well as a Preliminary Ecological Assessment (July, 1994) were performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site.

The public health risk assessment followed a four step process: 1) contaminant identification to identify those hazardous substances which, given the specifics of the site were of significant concern; 2) exposure assessment to identify actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; 3) toxicity

assessment to consider the types and magnitude of adverse health effects associated with exposure to hazardous substances, and 4) risk characterization to integrate the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks. The results of the public health risk assessment for the Site are discussed below followed by the conclusions of the environmental risk assessment.

Thirty-five contaminants of concern, found in Table 5, were selected for evaluation in the risk assessment (1994 BHRA). These contaminants constitute a representative subset of the more than sixty contaminants identified at the Site during the Remedial Investigation. The thirty-five contaminants of concern were selected to represent potential site related hazards based on toxicity, concentration, frequency of detection, mobility and persistence in the environment. A summary of the health effects of each of the contaminants of concern can be found in Appendix A, Toxicity Profiles, of the 1994 BHRA.

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the Site. Future land use for the Elm Street Site is expected to be recreational, with a designated utility worker area, and future land use at the Mill Street Site is expected to commercial. The following is a brief summary of the exposure pathways evaluated. A more thorough description can be found in the BHRA and in the amended BHRA, Appendix A of the FS.

Surface Soils

There are 3 locations at the Site were potential exposures to surface soils could occur: 1) surface soil at the Mill Street Site, 2) surface soil at the Elm Street Site and 3) surface soil along the drainage ditch. Exposure to surface soils in all areas could occur under the current commercial land use, when adults and children trespass and come in direct contact with contaminants in the surface soils through incidental ingestion, direct contact , or the inhalation of particulates. Surface soil is considered to be from the surface to 1 foot in depth.

In the future, the Town of Milford has indicated that it expects the Elm Street Site to become a part of the Keyes Field Recreation Area, with the primary purpose of this area being additional parking to the 10 acre recreation field. The Elm Street site would also potentially house a concession stand and restroom facility and provide additional access for the children to reach the main playing areas. Residential properties are located approximately 20 feet from the Mill Street Site and abut the Elm Street Site on the western side of the Keyes Drive. Children routinely cut across the Elm Street Site on their way to the nearby elementary schools, and to access the Keyes Field or access the Souhegan River. Potentially exposed populations for the future use include adults and children who visit the property for recreational purposes. The exposure pathways

would be the same as was used for the current use scenario. This future recreational use designation for the Elm Street Site would not limit the Town to the above stated purposed, but would however, limit the Town to the future use of the property in ways consistent with recreational activities.

The current and future use of the Mill Street Site is as a commercial area. The Mill Street Site is located extremely close to residential properties. Current and future use exposed populations include adults and children who visit the property for recreational activities. The exposure pathways include direct contact and incidental ingestion of the contaminated soils and inhalation of particulates. The same exposure pathways were evaluated for the drainage ditch.

For all scenarios, dermal contact and incidental ingestion of soils were evaluated for adults and children ages one to six years. The EPA recommended values for incidental soil ingestion of 100 mg/day for adults and 200 mg/day for children, and values of exposed skin surface area of 5,800 cm2 for adults and 2,000 cm2 for children were used to determine the risks associated with surface soil exposure. The exposure frequency was assumed to be 140 days per year over a 30 year residency (six and twenty-four years, respectively for adults and children). Refer to Table 6 for specific exposure parameters.

The potential surface soil exposure route of garden crop ingestion was considered only for the drainage ditch surface soils for adults, because gardening (at the time the risk assessment was conducted) was taking place along the ditch at one residential location. For this exposure pathway, uptake of contaminants into garden crops was modeled. The potential exposure pathways quantified, included ingestion of above-ground crops such as tomatoes and lettuce and root vegetables such as carrots. Refer to Table 6 for the specific exposure parameters.

Although some site areas are adequately covered by grasses and other vegetation which limit particulate emissions, other areas are not vegetated. Because no inhalation toxicity value existed for airborne PCBs, potential exposures via inhalation of particulates emitted from surface soils were qualitatively evaluated.

Subsurface Soils

The amended BHRA, 1996, evaluated exposures in the Elm Street Site and at the Draper Energy Property(which is part of the Mill Street Site), to subsurface soils which could be displaced to the surface during excavations related to utility work, recreational building or amenities, or commercial related excavation work(Draper Energy). No current exposures to subsurface soils on the Elm Street Site and on the Draper Energy Coal Yard are occurring, and thus these exposures were not evaluated. The change in future land use at the Elm Street Site and on the Draper Energy Coal Yard from future residential (assumed in the 1994 BHRA), to future recreational (assumed in the amended HBRA, 1996) was due to a reassessment of the land use by

the Town of Milford, NH (Lee Mayhew, Town Administrator, May 1, 1995). The results of the 1996 BHRA are presented in this ROD. At the Elm Street Site and the Draper Energy Coal Yard, it was assumed that a young child or adult could be exposed to subsurface soils that were brought to the surface during excavation. Exposure routes included incidental ingestion and dermal contact with contaminated soils. The exposure parameters used, were identical to those used for contact with the surface soils.

No current exposures to subsurface soils in the Mill Street Site are occurring. The Town of Milford reassessed the use of the Mill Street Site and concluded that it would be used as a right-of-way to expand Mill Street, giving a greater buffer between the residents along Mill Street and the road itself. (Lee Mayhew, town Administrator, may 1, 1995). Thus future exposures to subsurface soils at the Mill Street Site changed from residential exposures assumed in the 1994 BHRA, to no exposure assumed in the 1996 BHRA. Therefore, exposures to subsurface soils were not assessed.

Groundwater

Although groundwater from beneath the site is not currently in use, residential wells could be dug in this area, or a municipal supply well could be reinstated in the future. Potential exposure pathways for future residential exposure to contaminants in groundwater include ingestion, dermal contact and inhalation. Only the risks for groundwater ingestion by adults were quantified, using an ingestion rate of 2 liters per day for a 30 year residency period. Dermal exposure and inhalation to groundwater were not quantitatively evaluated because of the uncertainties associated with quantifying these exposure routes. The inhalation exposure was qualitatively evaluated by assuming that the exposure dose from inhalation while showering was equal in magnitude to that received from ingesting 2 liters of groundwater.

Drainage Ditch - Sediments and Surface Water

Adults and children ages 1 to 6 could wade in the drainage ditch because of its close proximity to residences, although there are usually low levels of water within the drainage ditch most of the year. These individuals could contact surface water and sediments. The potential exposure pathways include incidental ingestion of sediments and dermal contact with surface water and sediments. Incidental soil ingestion rates were 100 mg/day for adults and 200 mg/day for children ages 1 to 6, modified by a term "fraction ingested from source" of 10 percent. An exposed body surface area of 2,000 cm^2 was applied for children and 5800 cm^2 was applied for adults. Incidental ingestion and dermal contact with sediments were evaluated for a child (one to six years old) and for an adult who may be exposed 100 days per year for six and twenty-four years, respectively.

Risk Estimates

For each pathway evaluated, an average and a reasonable maximum exposure estimate was generated corresponding to exposure to the average and the maximum concentration detected in that particular medium. The table following this discussion summarizes the risks at the Site, for each exposure pathway. Risks associated with inhalation of various contaminants were evaluated qualitatively. Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical specific cancer factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6} for 1/1,000,000) and indicate, using this example, that an average individual is not likely to have greater that a one in a million chance of developing cancer over 30 years as a result of site-related exposure as defined to the compound at the stated concentration. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The hazard index was also calculated for each pathway as EPA's measure of the potential for non-carcinogenic health effects. A hazard quotient is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects for an individual compound. Reference doses have been developed by EPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The hazard quotient is often expressed as a single value (e.g. 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is approximately one third of an acceptable exposure level for the given compound). The hazard quotient is only considered additive for compounds that have the same or similar toxic endpoint and the sum is referred to as the hazard index (HI). (For example: the hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

Risk summaries for the contaminants of concern in each medium were evaluated to reflect present and potential future exposures corresponding to the average and the RME scenarios. Risk summaries for the contaminants of concern, which included: the ingestion of and dermal contact with surface soil at the Site; the ingestion and dermal contact with the subsurface soils at the Elm Street Site and the Draper Energy portion of the Mill Street Site; the ingestion of and dermal contact with surface soil and sediment and surface water in the drainage ditch; the ingestion of garden vegetables grown near the drainage ditch; and the ingestion of groundwater, are found in Tables 6 through 24.

FLETCHER'S PAINT SITE _ SUMMARY OF RISKS

Exposure Scenario	Noncarcinogenic Hazard Indices					Carcinogenic Risks				
	Average	Average Totals	Maximum	Maximum Totals	COCs with HI > 1 (max conc)	Average	Average Totals	Maximum	Maximum Totals	COCs with cancer risks > 1 x 10^-6 (max conc)
Surface Soil (Mill Street and Elm Street)										
Incidental Ingestion - Adults	1.1		11.9		PCBs	7E-05		6E-04		PAHs, PCBs, As
Incidental Ingestion - Children 1 to 6	11.3		112.5		PCBs	2E-04		2E-03		PAHs, PCBs, As
Total Soil Ingestion Risks		**12.4**		**124**			**2E-04**		**2E-03**	
Dermal Contact - Adults	13.6		132.5			7E-04		7E-03		PCBs
Dermal Contact - Children 1 to 6	21.8		223			3E-04		3E-03		PCBs
Total Soil Dermal Risks		**35.4**		**356**			**1E-03**		**1E-02**	
TOTAL SURFACE SOIL RISKS (MILL/ELM STREETS)		**47.8**		**479**			**1E-03**		**1E-02**	
Subsurface Soil (1 - 10 ft) (Elm Street) - Future										
Incidental Ingestion - Adults	21.8		41		PCBs	4E-04		2E-03		PCBs, As
Incidental Ingestion - Children 1 to 6	75.4		385.7		PCBs	1E-03		5E-03		PCBs, As
Total Subsurface Soil Ingestion Risks		**97.2**		**426.7**			**1E-03**		**7E-03**	
Dermal Contact - Adults	95		475			5E-03		3E-02		PCBs
Dermal Contact - Children 1 to 6	155		750			2E-03		1E-02		PCBs
Total Subsurface Soil Dermal Risks		**250**		**1225**			**7E-03**		**4E-02**	
TOTAL FUTURE SUBSURFACE SOIL RISKS		**347**		**1652**			**8E-03**		**5E-02**	

FLETCHER'S PAINT SITE - SUMMARY OF RISKS

Exposure Scenario	Noncarcinogenic Hazard Indices					Carcinogenic Risks				
	Average	Average Totals	Maximum	Maximum Totals	COCs with HI > 1 (max conc)	Average	Average Totals	Maximum	Maximum Totals	COCs with cancer risks > 1 x 10^-6 (max conc)
Surface Soil - Drainage Ditch										
Incidental Ingestion - Adults	0.1		0.43		none	9E-06		3E-05		PAHs, PCBs, As
Incidental Ingestion - Children 1 to 6	1.0		4.0		none	2E-05		8E-05		PAHs, PCBs, As
Total Soil Ingestion Risks		**2.1**		**4.4**			**3E-05**		**1E-04**	
Dermal Contact - Adults	0.06		0.32			3E-06		2E-05		PCBs
Dermal Contact - Children 1 to 6	0.1		0.5			1E-06		7E-06		PCBs
Total Soil Dermal Risks		**0.16**		**0.8**			**5E-06**		**2E-05**	
Total Crop Ingestion Risks		**1.7**		**6.9**	**PAHs, Inorgs**		**3E-05**		**1E-04**	**PAHs, PCBs, As**
Total Drainage Ditch Surface Soil Risks		**1.5**		**6.1**			**7E-05**		**2E-04**	
Surface Water - Drainage Ditch										
Dermal Contact - Adults	1E-04		3E-04		none	4E-09		9E-09		none
Dermal Contact - Children 1 to 6	1E-04		3E-04		none	5E-09		1E-08		none
Total Drainage Ditch Surface Water Risks		**3E-04**		**6E-04**			**9E-09**		**2E-08**	
Sediment - Drainage Ditch										
Incidental Ingestion - Adults	2E-03		9E-03		none	7E-07		4E-06		PAHs
Incidental Ingestion - Children 1 to 6	2E-02		8E-02		none	2E-06		9E-06		PAHs, As
Total Sediment Ingestion Risk		**2E-02**		**9E-02**			**2E-06**		**1E-05**	
Dermal Contact - Adults	0.03		0.09		none	2E-06		5E-06		PCBs
Dermal Contact - Children 1 to 6	0.15		0.4		none	2E-06		5E-06		PCBs
Total Sediment Dermal Risks		**0.18**		**0.5**			**4E-06**		**1E-05**	
Total Drainage Ditch Sediment Risks		**0.2**		**0.6**			**6E-06**		**2E-05**	
TOTAL DRAINAGE DITCH RISKS		**1.9**		**7.5**			**7E-05**		**2E-04**	

Ground Water Ingestion - Future						
Adults	**18**		**381**	ethylbenzene, toluene, Mn, PCBs	**1E-03**	**3E-02**	benzene, TCE, PCBs, 1,2-dichloroethane

Click here to go to Part 2 of Decision Summary