



**U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912**

**EASTLAND WOOLEN MILL SUPERFUND SITE PARTIAL DELETION
TECHNICAL MEMORANDUM**

DATE: June 29, 2012
TO: Site File
FROM: Ed Hathaway
Remedial Project Manager
RE: Eastland Woolen Mill Superfund Site, Corinna, Maine

1. Background:

**Eastland Woolen Mill Superfund Site
Corinna, Penobscot County, Maine
MED980915474
Site ID No: 0101043
EPA Lead
Operable Unit I**

1.1. Site Location:

The Eastland Woolen Mill Superfund Site ("Site") is located in the Town of Corinna, Penobscot County, Maine, approximately 6 miles north of Newport and 25 miles northwest of Bangor, Maine. Approximately 800 people live within one mile of the Site and 2,500 live within four miles. The Town of Corinna is located within the East Branch of the Sebasticook River (EBSR) watershed, which drains to Sebasticook Lake approximately three miles south of the Town. The river supports many fisheries, wetlands and sensitive environments. Bald Eagles that nest north of the site are known to use the river near the site, and two Bald Eagle nests are located downstream of the site on Sebasticook Lake.

Topography within the watershed is typified by gently rolling hills to steeply sloping ridges, varying from narrow valleys to fairly expansive low-lying floodplains. Elevations within the immediate vicinity of Corinna range from 200 to 320 feet above mean sea level (msl). The former Eastland Woolen Mill straddled the EBSR and the southern portion of the former Mill Pond. Figure 1 shows the location of the Site.

The future land use assumptions for the Site and surrounding areas are based on the Reuse Plan developed by the Town of Corinna. The Reuse Plan identified a mix of commercial, residential and mixed-use development for the area that includes the Site. The majority of the Site, about 20 acres, is currently available for re-use since the current cleanup program only occupies about five

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of the 25 acres that were at one time part of the cleanup activities at the Site. EPA plans to remove these 20 acres from the boundary of the Site to facilitate further reuse. A portion of the Site was brought into productive re-use when a 20 unit senior housing facility, Corundel Commons, opened in February 2006.

Because the cleanup work is subsurface and episodic in nature, EPA has worked with the community to allow limited use of the Site when the cleanup is not active. A war memorial and a bandstand were constructed on land that will remain within the Site boundary but are available for public use. See Figure 2 for the location of the areas of the Site that have been returned to productive use.

1.2. Site Operational History:

The Site was formerly dominated by the Eastland Woolen Mill (EWM) building complex which, before its demolition in 2000, was comprised of a large manufacturing building and several ancillary structures, with a total area of 250,000 square feet. The buildings stood on both sides of and over the EBSR, a State-designated Class C water, which flows north to south through the center of Corinna. The original woolen-mill structure was built in the late 1800s or early 1900s. The property was a woolen mill as far back as 1912. EWM owned and operated the mill from 1936 to October 1996, when they closed the mill. Prior to closing in 1996, EWM was a manufacturer and finisher of wool and blended woven fabric. Fabric finishing included dyeing of the fabric to meet product or customer requirements. This dyeing operation took place in dye kettles and utilized various chemicals, including dyes and dye-aids that reportedly contained biphenyl and chlorinated benzene compounds, including 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene. Until construction of the Town of Corinna Wastewater Treatment Plant (WWTP) in 1969, liquid wastes from the mill were discharged to the ground surface beneath mill buildings, to Mill Pond Dam tailrace, and ultimately the EBSR. It was not until 1977 that all liquid waste streams were finally directed to the WWTP. Figure 3 shows the former EWM complex.

1.3. Pre-NPL Environmental Assessments:

As a result of the discharge of waste from the dyeing of fabrics, the soil and groundwater underlying mill buildings along with the river sediment extending several hundred feet down-gradient of the former EWM were contaminated with chlorinated benzene compounds. Groundwater was contaminated at concentrations well above federal drinking water Maximum Contaminant Levels (MCLs) and State of Maine drinking water Maximum Exposure Guidelines (MEGs). Routine pumping of nearby residential bedrock wells spread the contamination laterally along bedrock bedding-plane fractures.

In 1983, drinking water wells along Main Street in Corinna near the EWM were found to be contaminated by volatile organic compounds (VOCs), primarily chlorobenzene compounds. An employee of the Maine Department of Environmental Protection (MEDEP) visited a Corinna restaurant and found the water had a peculiar odor and taste. This led to sampling and analysis, which revealed that the restaurant water (from a bedrock well) was contaminated by chlorobenzene compounds above the maximum contaminant levels (MCLs). At the time when

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the contamination was discovered the entire community relied on individual private ground water wells for drinking water. By 1988, a total of 11 locations had chlorobenzene contamination at levels warranting the installation of granular activated carbon (GAC) filters to treat individual water supplies. In 1995, the Corinna Water District (which was created in 1994) began supplying water to customers. In October 1996 EWM closed and its creditors sold its secured assets. In 1997, the Town of Corinna obtained title to the property as compensation for taxes owed.

Prior to the closure of the EWM, the company performed environmental investigations of the downtown area in 1984. The work included the completion of soil borings, installation of monitoring wells and piezometers, sampling and analysis of soil and groundwater and a preliminary fracture-trace analysis. The investigation concluded that additional work was needed to identify a contaminant source area. By 1988, EWM had completed a study of residences and businesses at risk from the groundwater contamination, and had investigated potential locations for installation of a public water supply system. It was concluded that contamination had likely spread via bedrock fractures and faults.

In 1993, EWM completed Phase I of a chlorinated benzene contamination investigation in the downtown area. The report identified the tailrace beneath the EWM and the underground storage tank (UST) area where dye-aid had been stored adjacent to Building 13 as possible source locations.

EWM removed three USTs from the UST Area in 1994. Chlorinated benzene compounds were detected in soil samples collected from the bottom of the excavation. An overburden groundwater recovery well (R-1), consisting of a 30-inch-diameter corrugated metal pipe with slits in the bottom five feet and surrounded by crushed stone, was installed at the site after removal of the USTs, because free product was reported in the excavation and soil staining was observed. In addition, a drum containing a dark oil-like substance was unearthed in the UST excavation. Recovery Well R-1 was pumped to collect chlorinated benzene-contaminated groundwater and flush contaminants from the “smear” zone between August 1994 and sometime in 1995. In conjunction with the pumping of groundwater from Well R-1, EWM instituted pumping of groundwater from the bedrock well on Lot 122, south of Main Street, now referenced as Recovery Well R-2.

In the fall of 1995, during the installation of water supply lines to serve contamination affected residences, personnel working for EWM observed excavation activities in the riverbed just downstream of the Main Street bridge. During this excavation, a dense non-aqueous-phase liquid (DNAPL) was reportedly observed within the till material beneath the gravel riverbed. EWM performed additional sampling of the sediments in the riverbed downstream of the EWM and found chlorinated benzene compounds and petroleum hydrocarbons both within the silty till layer beneath the rocky, gravel riverbed and in a floodplain on the west side of the river.

After closure of the EWM in 1996, MEDEP sampled soils around the former USTs adjacent to Building 13 to evaluate whether residual soil contamination was present and acting as a source of groundwater contamination. This effort was supplemented in 1998 with additional analytical parameters and sampling of a background location. In 1997, MEDEP performed sediment

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sampling with field chemical screening to gain information on the magnitude of river bottom contamination documented in 1995. Additional sediment and surface water samples were collected from the river in 1998 for off-site analysis. These investigations confirmed that high concentrations of chlorinated benzenes were present in the riverbed over 1000 feet downstream of the EWM complex. These data were used to prepare the Hazard Ranking System scoring package that was submitted to EPA for placement of the Site on the National Priorities List (NPL).

In 1997, MEDEP performed an emergency response action to remove 54,673 pounds of various hazardous substances from process pipes, containers and vessels located within the EWM.

1.4. National Priorities List (NPL) Designation:

The Site was proposed for inclusion on the NPL on April 23, 1999 (64 Fed. Reg. 19968). It was listed for final inclusion on the NPL on July 22, 1999 (64 Fed. Reg. 39878-39885). The description of the Site at the time of the NPL listing is presented below:

The Eastland Woolen Mill site (the site) consists of the mill property and areas where contamination has migrated or otherwise come to be located due to mill operations. The Eastland Woolen Mill property is a 21-acre parcel located on the north side of Main Street, Corinna, in central Maine. There is a 250,000 square foot Mill building, two dams, and several out buildings on site. The mill building straddles the East Branch of the Sebasticook River with one dam located under the building near main street; the other dam is located approximately 500 feet north of the mill and maintains the water level of Corundel Lake, a portion of the East Branch of the Sebasticook River. The two dams also create an on-site mill pond. The site is bordered to the north by Corundel Lake and residential property, to the south by Main Street, to the east by the Dexter Road and the Methodist Church, and on the west by Route 43 and several residential properties.

2. EPA Response Actions:

The response actions at the Eastland Woolen Mill include the remedial investigation and feasibility study (RI/FS) along with the Non-Time-Critical Removal Action (NTCRA) and Operable Unit I (OUI) EPA cleanup activities.

2.1. Remedial Investigation and Feasibility Study (RI/FS):

From 1998 to 2002, USEPA performed the RI/FS for OUI at the EWM site. The RI was performed concurrent with planning activities for the NTCRA and focused on those areas that were not within the scope of the NTCRA. At the completion of the OUI RI, the EWM site was divided into two operable units. The location of the operable units is shown in Figure 4.

OUI is the groundwater operable unit and includes overburden and bedrock groundwater contamination associated with the EWM complex, Building 14 and the UST Area including some areas of soil contamination remaining after the NTCRA. The early soil cleanup conducted

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under the NTCRA removed all soil contamination above the bedrock surface except in a few areas that were not accessible to excavation. These areas, which were subsequently included in the OUI RI, are shown in Figure 5 and include deep soil remaining above bedrock under the EWM complex that was adjacent to the Route 7 bridge, and small areas of shallower soil contamination at the UST Area and Building 14.

The RI for the OUI Study Area identified two areas where site-related contaminants exceed federal and state drinking water criteria in overburden groundwater. One area is associated with the UST Area/Building 14 sub-area, and the other is downgradient of the former location of Buildings 1, 1A, and 3 within the EWM complex where liquid wastes were discharged. The RI also identified an area of bedrock groundwater contamination associated with the release of contamination from Buildings 1, 1A, and 3. The major groundwater contaminants of concern (COCs) were determined to be benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene. EPA signed a ROD for OUI in September 2002 and revised the OUI Remedial Action with a ROD Amendment that was signed in September 2006. Figure 6 identifies the area of groundwater contamination at the time of the 2002 ROD and 2006 ROD Amendment.

The OUI RI and ROD also documented that three satellite areas of suspected contamination (School Street Yard, Moosehead Mill, and Bulk Fuels Storage Area) were not considered part of the Site based on the absence of contamination that would represent an unacceptable threat to human health or the environment. A fourth area, known as Lot 88, was also identified as not requiring any further action after the NTCRA removed the soil contamination from this property. These areas are shown in Figure 7. The details of the OUI RI/FS can be found in the Remedial Investigation Report, Supplemental Remedial Investigation Report, Human Health Risk Assessment Report and Baseline Ecological Risk Assessment Report that are included in the Administrative Record for the OUI Record of Decision (ROD).

In September 2002, EPA created OUII to address the sediment and associated floodplain areas of the EBSR downstream of NTCRA excavation, as well as an area of solid and liquid waste disposal known as the Old Dump. During 2002 and 2003, EPA performed a series of studies to better define the potential for ecological impacts in the OUII area. Surface water, sediment, floodplain soil, and crayfish tissue samples were collected for analysis and biological assessments of the benthic macro-invertebrate community were performed. The information from these studies was presented in a Supplemental RI Report. The information was also combined with the initial RI data to prepare a revised Baseline Ecological Risk Assessment Report that found there was no unacceptable risk to ecological receptors in the OUII area. Both reports were released in 2004 as part of the Administrative Record and were available for review during the public comment period for the OUII Proposed Plan. On September 30, 2004, EPA signed a ROD selecting No Further Action for OUII of the Site. EPA activities in the OUII Study Area are complete, and no further activities are anticipated. The OUII study area is shown in Figures 4 and 7.

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2.2. Non-Time-Critical Removal Action (NTCRA):

In January 1999, EPA signed an Approval Memorandum authorizing the preparation of an Engineering Evaluation and Cost Analysis (EE/CA) to evaluate potential response alternatives for a NTCRA at the Site. The EE/CA recommended demolishing the EWM complex buildings to allow for the excavation and treatment of the contaminated soils on the Site. After completion of a public comment period and consideration of the comments, EPA signed an Action Memorandum in July 1999 to authorize a NTCRA for the Eastland Woolen Mill Superfund Site. The Action Memorandum was amended in June 2000, September 2000, May 2001, and June 2004.

This NTCRA included the removal of the mill buildings (performed during the winter of 1999/2000) and contaminated soils from four areas (performed from 2000-2001). NTCRA work areas, shown in Figure 8, include:

- Area 1: Region underlying Mill Buildings 1, 1A, and 3 (2001)
- Area 2: River segment down river from the mill to the abandoned railroad trestle (2000)
- Area 2a: River segment under the abandoned railroad trestle and overlapping Area 2 and Area 3 (2000)
- Area 3: River segment for a distance several hundred feet beyond the railroad trestle (2000)
- Area 4: Lot 88, Building 9, UST Area, and other miscellaneous areas (2000 and 2001)

During 2000 and 2001 approximately 75,000 cubic yards (yd³) of chlorinated-benzene contaminated soils were excavated and stockpiled at the Site in lined containment structures. In 2001, pilot testing of an on-site low temperature thermal soil treatment system was performed. The results of this pilot test indicated that the treatment system could meet established treatment goals. Full-scale on-site treatment of contaminated soil began in October 2002 and was completed in October 2003. Testing of the soil after treatment documented that all of the soil that was used for on-site backfill contained residual levels of contamination below residential cleanup standards and met the NTCRA groundwater leaching criteria that were developed during the NTCRA. Table 1 summarizes the soil confirmation sampling performed as part of the low temperature thermal treatment component of the NTCRA. To support the NTCRA excavation and thermal treatment activities, a temporary groundwater extraction and treatment system was constructed to aid in control of groundwater infiltration during excavation activities. One bedrock well and four overburden wells were connected to a temporary treatment system. The system remained operational until November 2004 to provide hydraulic control over the groundwater plume during the initial phase of the NTCRA.

Details concerning the NTCRA source removals are presented in the Final Completion Report, Areas 2, 3, 4-Lot 88, and 4-Building 4 Soil Remediation NTCRA, Eastland Woolen Mill Superfund Site, Corinna, Maine and Areas 1 and 4 Soil Remediation and River Restoration Final Completion Report, Eastland Woolen Mill Superfund Site, Corinna, Maine, February 2004. The extent of the excavation activities performed during the NTCRA is shown in Figure 8.

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Table 1
NTCRA Soil Cleanup Analytical Summary

Contaminant	NTCRA Soil Cleanup Level (ug/kg)	95% Upper Confidence Level Concentration of soil used as backfill after treatment (ug/kg) based on 4,200 soil samples
1,2,4 Trichlorobenzene	5,000	4,451
1,2,3 Trichlorobenzene		1,408
1,2 Dichlorobenzene	17,000	610
1,3 Dichlorobenzene	41,000	285
1,4 Dichlorobenzene	2,000	563
Chlorobenzene	1,000	169
Benzene	30	*

Note: Benzene was only detected twice in 4,183 samples.

As previously discussed, three areas of contaminated soil were not accessible to the NTCRA excavations. The final phase of the NTCRA targeted the reduction of contamination in these source areas using in-situ chemical oxidation (ISCO). These areas are shown in Figure 9.

In Spring 2005, 20 injector wells were installed in the UST Area and the former Building 14 Area to depths ranging from 15 to 30 ft bgs. ISCO treatment consisted of two full-scale injections of iron-catalyzed sodium persulfate (ICP), followed by confirmatory soil borings and groundwater sampling. These injections were performed in July and October/November 2005. A total of 13,319 gallons of persulfate solution (22,120 lbs of oxidant) and 13,514 gallons of chelated iron solution were delivered to the UST Area and Building 14 Area. Confirmatory soil borings and groundwater sampling indicated an approximate 90% reduction of dissolved phase contamination and an approximate 71% reduction in sorbed phase soil contamination following the Phase I ICP applications.

In August 2005, one full-scale round of Phase II ISCO treatment was implemented for Area 1. ICP was delivered to the subsurface via 11 ISCO injector wells. Approximately 19,256 gallons of persulfate (31,947 lbs of oxidant) and 19,423 gallons of chelated iron solution (2,429 lbs) were delivered to the Phase II treatment area. Confirmatory groundwater sampling performed following full-scale ISCO application indicated a reduction of dissolved phase contamination by approximately 63%. Soil sampling performed following the ISCO Pilot study indicated a 38% reduction in residual DNAPL contamination. The Phase II Task Plan and Phase II Full Scale ISCO Injection Plan - Application #1 describe the activities that were performed to further the completion of NTCRA source reduction in this area. The "2005 Phase I and Phase II ISCO Remedial Performance Assessment Eastland Woolen Mill Superfund Site, Non-Time Critical Removal Action, Corinna, Maine, May 2006" documents that the ISCO has been successful in reducing the mass of contamination in the Phase II Area. The ISCO for the Phase II program continues as part of the OUI RA.

The NTCRA program ended in May 2006 as documented by the Final Pollution Report (POLREP) for the Eastland Woolen Mill NTCRA that was finalized in September 2006.

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2.3. Remedial Action:

In addition to the Action Memorandum to authorize the NTCRA, EPA completed a Record of Decision for each of the two operable units for the Eastland Woolen Mill site.

2.3.1. OUI ROD

The 2002 OUI ROD was issued to address overburden and bedrock groundwater and remaining areas of contaminated soil/DNAPL and restore the aquifer to federal and state MCLs, federal non-zero MCLs and more stringent state MEGs. The OUI remedy targeted the restoration of contaminated groundwater through treatment using both extraction and ex-situ treatment and the application of in-situ reagents. The ROD stated that treatment of the groundwater will be accomplished in two ways: (1) groundwater will be extracted from the ground and treated to reduce the concentration of contaminants to levels that are protective of human health and the environment and achieve the applicable criteria for discharge into either the EBSR or the groundwater; and (2) in-situ reagents will be used to facilitate the removal of contamination (via in-situ oxidation and in-situ surfactant addition, in combination with the addition of bio-stimulants as a polishing step). Institutional controls will restrict the future use of the Site to prevent ingestion of groundwater and disruption of the groundwater extraction and treatment system. This cleanup approach was expected to control the off-site migration of contaminated groundwater and restore the aquifer to drinking water standards.

OUI also targeted the soil contamination remaining after the NTCRA ex-situ and in-situ soil treatment programs. The soil excavation and ex-situ soil treatment program conducted under the NTCRA removed all soil contamination above the water table and most soil contamination, including the DNAPL below the water table, except in a few areas under the former EWM complex, the UST Area and Building 14 Area that were not accessible during the NTCRA. The in-situ ISCO program performed as part of the NTCRA completed the source reduction in the UST Area and Building 14 Area and reduced the source material in Area 1 of the Site. The OUI ISCO program will target the remaining contaminated soils and DNAPL located in Area 1 of the Site that acts as a continuing source of groundwater contamination. The OUI program will also include long-term assessment of the Building 14 Area and UST Area to confirm that the NTCRA source reduction was successful. Figure 5 shows the soil contamination area that will be the focus of OUI Remedial Action and Figure 6 shows the extent of groundwater contamination at the time of the 2002 ROD and 2006 ROD Amendment.

Specifically, the 2002 OUI ROD includes the following major components:

- Extraction and treatment of the contaminated overburden and bedrock groundwater. The extraction system will be designed to prevent off-site migration of contaminated groundwater, prevent contaminated groundwater from having an adverse impact on the benthic community in the EBSR, and restore the aquifer to federal and state MCLs, federal non-zero MCLGs and more stringent state MEGs.
- In-situ treatment of the contaminated overburden and bedrock groundwater and remaining areas of contaminated soil and DNAPL. A chemical reagent (*e.g.*, Fenton's Reagent or

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another oxidizing agent) will be added to the overburden and bedrock aquifer to reduce the mass of contaminants in the system. If the mass reduction is not sufficient to achieve cleanup levels, then enhanced flushing (using surfactants/solvents) and biological degradation (using bio-stimulants) will be attempted to further reduce the mass of contamination.

- Connection of certain residences to the water supply lines to prevent their wells from becoming contaminated, and to prevent expansion of the contamination in the groundwater.
- Implementation, monitoring and maintenance of institutional controls (*i.e.*, deed restrictions) in the form of groundwater use restrictions (*e.g.*, easements or restrictive covenants) to prevent ingestion of groundwater and disturbance of the groundwater extraction and treatment system.
- Long-term monitoring of groundwater, surface water and sediments to evaluate the success of the remedial action.
- Implementation of five-year reviews to assess the protectiveness of the remedy until cleanup goals have been met.

The selected remedy addresses principal and low-level threat wastes at the Site by both reducing the mass of contamination, including DNAPL, in the soil and bedrock fractures and containing and treating the contaminated groundwater to achieve groundwater restoration.

2.3.2. OUI ROD Amendment:

The 2002 OUI ROD was written prior to the completion of the NTCRA that commenced in 1999. Therefore, the impact of the NTCRA-related excavation and treatment of the contaminated overburden source areas was uncertain at the time of the ROD. Subsequent to the signing of the 2002 OUI ROD and the completion of the NTCRA excavation and treatment program, EPA performed assessment monitoring of the groundwater. EPA also developed an improved conceptual site model through additional hydro-geologic investigations and groundwater modeling. The primary results of the investigations and monitoring from 2002 – 2005 are presented below:

- The groundwater plume was found to be receding as a result of the NTCRA cleanup activities and the connection of certain water supply wells to the Corinna Water District water line. This eliminated the major pumping stresses that were influencing the expansion of the groundwater contamination. Since the groundwater contaminant plume was no longer expanding, containment of the groundwater contaminant plume to prevent expansion was no longer necessary. The institutional controls that are being developed as part of the OUI Remedial Action will prevent the re-use of the water supply wells that could cause the area of groundwater contamination to expand.

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- Monitoring of the groundwater and surface water indicates that the EBSR is not being impacted by the groundwater contamination; therefore the benthic community in the EBSR is no longer threatened by the Site contamination. An assumption of the 2002 OUI ROD was that the EBSR may be impacted by the discharge of contaminated overburden groundwater. Prior to the NTCRA, contaminated groundwater contributed to severe ecological impacts in the EBSR. The EBSR was relocated as part of the NTCRA and the combined benefit of the relocation of the EBSR and elimination of the majority of the source contamination was not known at the time of the 2002 OUI ROD. To assess the potential for impacts to the EBSR after completion of the soil excavation and ex-situ treatment phase of the NTCRA, groundwater samples were collected from a series of piezometers installed within the EBSR channel. One sample collected from a piezometer located adjacent to Area 1 contained chlorinated benzene compounds at concentrations less than the federal and state drinking water standards. In addition, samples collected from piezometers installed within the base of the river did not contain detectable concentrations of chlorinated benzene compounds.
- Groundwater modeling based on the most updated Site information revealed that the time frame to achieve aquifer restoration without a groundwater extraction and treatment system was only slightly longer than the time frame with the groundwater extraction and treatment system. The time frame to achieve aquifer restoration has two components. The first component is the removal of the principal threat source material through the ISCO and biological enhancements. This first component is identical in both the original 2002 OUI ROD remedy, identified as GW-4 in the FFS, and the amended OUI remedy, identified as GW-4a in the FFS. The second component of the restoration is the aquifer recovery through long-term natural attenuation processes, either facilitated by groundwater extraction, as included in Alternative GW-4, or through non-active processes, as included in Alternative GW-4a. The time frame for the source removal under both Alternative GW-4 and GW-4a is estimated at 15 years. Subsequent to the 15 year period required for source removal, an additional 15 to 60 years is estimated to be necessary to achieve full aquifer restoration for Alternative GW-4 with the use of long-term groundwater extraction and treatment. This results in an estimated range for the cleanup of 30 to 75 years, with 60 years being selected in the FFS as a reasonable estimate for the basis of alternative comparison and cost evaluation. For Alternative GW-4a, without the use of long-term groundwater extraction and treatment, the estimated time period to achieve aquifer restoration is 30 to 74 years, resulting in a cleanup range of 45 to 89 years and with 80 years being selected as a reasonable estimate for the basis of alternative comparison and cost evaluation.
- The 20 year time difference between GW-4 and GW-4a is not considered significant for the following reasons:
 - The groundwater plume that will remain after the NTCRA and ISCO programs is located under roadways and greenspace within an area where groundwater use is prohibited and a water line is available. There is therefore minimal potential for human consumption of the groundwater during the additional 20 years.
 - The time frame estimates were developed using the information available and are considered reasonable for alternative comparison; however, there is substantial

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uncertainty associated with these estimates. The actual difference in time frame for aquifer restoration could therefore be much smaller than estimated.

- The pilot testing and initial applications of the oxidizing reagent, persulfate, supports the conclusion that this technology would be appropriate for use in the deep bedrock. Therefore, EPA does not expect to use the enhanced flushing with surfactants or co-solvents as a cleanup technology for OUI.

Based on the above information, EPA decided to amend the 2002 OUI ROD to eliminate the groundwater extraction and treatment system as well as the enhanced flushing component with surfactants or co-solvents in order to achieve the remedial action objectives and cleanup goals in a more cost effective manner.

2.3.3. OUI ROD and OUI Amendment Risk Summary

The 2002 OUI ROD included an assessment of the potential threats to human health in the OUI study area. Based on the Human Health Risk Assessment prepared as part of the RI and the 2002 OUI ROD, the only pathways that exceed EPA's acceptable cancer risk range and/or a hazard quotient of concern are ingestion of groundwater in the overburden and bedrock plumes by a future resident. The lifetime cancer risk estimate for a combined child and adult exposure to the bedrock plume groundwater is 6×10^{-3} . Seventy-five percent of this risk is due to arsenic, with twenty-five percent attributable to the 1,4-DCB. EPA's hazard index of concern for non-carcinogenic risk is exceeded for children and adults for several target organs. The major contributors to these exceedances are chlorobenzene, 1,2-DCB, 1,3-DCB, 1,4-DCB, 1,2,4-TCB and arsenic. These COCs also were detected at concentrations above federal and state maximum contaminant levels (MCLs) and more stringent state maximum exposure guidelines (MEGs).

The lifetime cancer risk estimates for the overburden plume groundwater is 2×10^{-3} . Sixty-seven percent of this risk is attributable to 1,4-DCB, with arsenic contributing to the remainder of the cancer risk. EPA's hazard index of concern for non-carcinogenic risk is exceeded for children and adults for several target organs. The major contributors to these exceedances are chlorobenzene, 1,2-DCB, 1,3-DCB, 1,4-DCB, 1,2,4-TCB and arsenic. These COCs also were detected at concentrations above federal and state MCLs and more stringent state MEGs. The Baseline Human Health Risk Assessment concluded that the estimated risk for the soils, surface water, or sediments within the OUI area do not represent an unacceptable threat to human health. Only groundwater represents a threat to human health. Soil contamination that is causing groundwater contamination is also relevant to the cleanup action.

The groundwater beneath and surrounding the Site still remains a drinking water aquifer. Although data gathered since the 2002 OUI ROD was issued demonstrates that the groundwater plume has receded and contaminant mass is reduced, contaminant levels still exceed drinking water standards and ingestion of groundwater continues to pose a risk to human health consistent with the risks summarized above.

The OUI ROD concluded that contaminant levels in surface waters, surface soils and sediments within the OUI area of the EBSR are not sufficiently elevated to pose a substantial risk to

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invertebrates, fish and wildlife through direct contact and dietary exposure to the Site-related COCs. Exposure to the contaminated water at the groundwater/surface water interface, however, was identified as an unacceptable risk to those organisms dwelling in this zone. Data gathered since the 2002 OUI ROD, however, demonstrate that the concentration of contaminants in the groundwater do not exceed the levels that have the potential for an unacceptable risk to organisms dwelling in the groundwater/surface water interface. Therefore, the successful implementation of the NTCRA and OUI remedy has eliminated this risk.

2.3.4. OUI ROD and OUI ROD Amendment Remedial Action Objectives

Based on preliminary information relating to the types of contaminants, environmental media of concern and potential exposure pathways, response action objectives (RAOs) were developed to aid in the development and screening of alternatives. These RAOs were developed to mitigate, restore and/or prevent existing and future potential threats to human health and the environment. The RAOs for the selected OUI Remedial Action remain the same and are repeated below:

- Prevent the ingestion of groundwater containing contaminants that exceed federal or state MCLs, federal non-zero MCL Goals (MCLGs) and more stringent state MEGs, or in their absence, an excess cancer risk of 1×10^{-6} or a hazard quotient of 1;
- Prevent, to the extent practicable, the off-site migration of groundwater containing contaminants at a concentration above Site cleanup levels;
- Prevent, to the extent practicable, the discharge of groundwater containing contaminants at a concentration above levels that could impact ecological receptors to the East Branch of the Sebasticook River;
- Restore groundwater to meet federal or state MCLs, federal non-zero MCLGs or state MEGs (whichever is most stringent), or in their absence, an excess cancer risk of 1×10^{-6} or a hazard quotient of 1; and
- Perform long-term monitoring of surface water, sediments and groundwater to verify that the cleanup actions at the Site are protective of human health and the environment.

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2.3.5. OUI ROD and OUI ROD Amendment Cleanup Levels

The groundwater cleanup levels established in the 2002 OUI ROD and 2006 OUI ROD Amendment are listed below.

Table Site Specific Groundwater Cleanup Levels				
Carcinogenic Chemicals of Concern	Cancer Classification	Cleanup Level (ug/l)	Basis	RME Risk
arsenic	A	10	MCL	2×10^{-04}
1,4 dichlorobenzene	C	27	1992 MEG	1×10^{-05}
benzene	A	5	MCL	2×10^{-06}
Sum of Carcinogenic Risk				2×10^{-04}
Non-Carcinogenic Chemicals of Concern	Target Endpoint	Provisional Cleanup Level (ug/l)	Basis	RME Hazard Quotient
arsenic	skin	10	MCL	2.1
manganese	central nervous system	200	MEG	0.57
benzene	hematological system	5	MCL	0.12
chlorobenzene	liver	47	1992 MEG	0.018
1,2 dichlorobenzene	liver	85	1992 MEG	0.085
1,3 dichlorobenzene	liver	85	1992 MEG	9.4
1,4 dichlorobenzene	liver/kidney	27	1992 MEG	0.080
1,2,4 trichlorobenzene	Endocrine system	70	MCL	0.78
HI (liver): 9.7 HI (central nervous system): 0.57 HI (skin): 2.1 HI (endocrine system): 0.78				
<u>Key</u> MCL: Federal Safe Drinking Water Act Maximum Contaminant Level MCLG: Federal Safe Drinking Water Act Maximum Contaminant Level Goal MEG: State of Maine Maximum Exposure Guidelines HI: Hazard Index RME: Reasonable Maximum Exposure				

2.4. OUI Remedial Design

The Remedial Design for the OUI Remedial Action was initiated in 2003 and completed in August 2005. Two components of the OUI Remedial Action were not included in the design: design of a long-term groundwater extraction and treatment system and the enhanced flushing (using surfactants or solvents) of the deep bedrock aquifer because these components were removed from the Remedial Action as a result of the 2006 ROD Amendment. The Remedial Design was implemented in close coordination with the final phase of the NTCRA ISCO

Eastland Woolen Mill Partial Deletion Technical Memorandum

program since both programs relied on ISCO to reduce the mass of contamination in the overburden soil and bedrock. As such, the NTCRA design support activities and the Remedial Design support activities are complementary.

A series of additional studies and investigations were performed between 2003 and 2005 to develop the design for the NTCRA ISCO program and the in-situ treatment portion of the OUI Remedial Action. The results and conclusions of these investigations are summarized in the FFS and are reported in greater detail in the Conservative Interwell Tracer Test (CITT) Design, Conceptual Model Update Report, and the OUI Remedial Design Report. The studies and investigations performed to support the design activities included:

- **ISCO Pilot Study:** The ISCO Pilot Study performed for the NTCRA ISCO program was incorporated in the Remedial Design for the OUI ISCO program and resulted in the selection of ICP as the oxidant technology for the OUI Remedial Action ISCO programs.
- **Bedrock Well Installations:** Fifteen bedrock boreholes were drilled in Area 1. Bedrock fractures were characterized by borehole geophysics, and water samples were collected by packer methods. Shallow fracture DNAPL distribution and rock matrix properties were assessed by methanol extracted rock samples (MERC). These well locations provide characterization data for the Area 1 bedrock groundwater and contribute to the overall understanding of the bedrock fracture system and its behavior under pumping conditions.
- **Hydraulic Control Pump Test:** In September 2004, a multi-well pump test was initiated utilizing six pumping wells (EW-2, EW-3, EW-4, EW-5, EW-6, and EW-7). During the test, individual well flow rates were gradually increased or decreased depending on individual well responses. The pumping test was completed by October 2004, when the CITT/Electrical Resistivity Tomography (ERT) baseline was initiated.
- **Conservative Interwell Tracer Test (CITT):** A CITT was designed and performed during October 2004 under forced gradient conditions to demonstrate that measurable flow paths exist within the aquifer. Data was used to evaluate dilution factors to verify the scale at which adequate minimum oxidant and surfactant concentrations could be maintained and to demonstrate sufficient aquifer connection at a scale suitable for treatment.
- **Partitioning Tracer Test (PITT):** An initial PITT was designed and performed in conjunction with the CITT. This pilot-scale PITT was performed within the DNAPL source zone to assess the volume of DNAPL contacted within the swept aquifer volume.
- **Electrical Resistivity Tomography (ERT)/Induced Polarization (IP):** ERT was completed prior to and in conjunction with the CITT to identify preferential pathways of saline solutions in the fracture system between individual boreholes. Selected IP profile panels were also completed.
- **Assessment Monitoring:** Area-wide groundwater and drinking water sampling was implemented to evaluate and quantify the nature and extent of the overburden and bedrock contaminant plumes that remained after NTCRA activities. The results from the 2004 area-wide sampling event are presented in the 2005 Area-Wide Groundwater Sampling Technical Memorandum. The results from the 2005 area-wide sampling results are presented in the spring 2006 Area Wide Groundwater Sampling Technical Memorandum.

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- Bedrock wells to assess aquifer characteristics: Off-site bedrock borehole installations and groundwater pumping tests provided refined estimates of aquifer transmissivity and anisotropy at locations east of the EBSR. Results are presented in the Conceptual Model Update Technical Memorandum.
- Groundwater Modeling: Groundwater flow and contaminant transport numerical model simulations assessed the long-term impacts of the bedrock contaminant plume under various potential future site conditions based on varying degrees of contaminant mass reduction. The modeling is described in the Institutional Control Zones Groundwater Modeling Report.
- Long-Term Monitoring: A Long-Term Monitoring Plan (LTMP) was developed for future area-wide sampling to be performed for the evaluation of plume migration and impacts.
- Institutional Controls and Water Line Connections: The results of the area-wide sampling and groundwater modeling were used to identify the properties that should be connected to the public water supply. The results were also used to finalize the extent of the ICZ. Based on the groundwater modeling that was performed for the OUI Remedial Design, the OUI ROD Amendment revised the area where institutional controls would be necessary and defined three categories of properties within the institutional control zone.

The Institutional Controls refinements that were developed as a result of the Remedial Design were documented in the 2006 OUI ROD Amendment and September 2008 OUI Interim Remedial Action Report. Three property categories were initially identified as part of the Institutional Control Plan. The successful implementation of the Remedial Action resulted in the combination of the initially defined Institutional Control Zone B (ICZ B) into the Institutional Control Zone A (ICZ-A), as ICZ-B targeted the properties that had yet to be connected to the public water supply. All properties were connected to the public water supply by December 2005. The remaining Institutional Control Zone areas are shown in Figure 10 and described below:

- ICZ-A identified those properties that will be subject to environmental covenants prohibiting use of groundwater over the entire property. All of the ICZ-A properties had been connected to the water line prior to the OUI ROD. Within the ICZ-A boundary, all existing bedrock and overburden water supply wells will be formally decommissioned, unless the wells are converted to monitoring wells for use in the long-term remedial action. ICZ-B identified those properties where connection to the water line and implementation of an environmental covenant prohibiting use of groundwater over the entire property was determined to be necessary as part of the OUI ROD and Remedial Design. All of these properties had been connected to the water line as part of the OUI Remedial Action by the end of 2006, moving these properties to ICZ-A; there is therefore no longer a functional application for ICZ-B.
- ICZ-C identified those properties where the current well is not contaminated and does not appear to be impacting the groundwater contamination, however, the groundwater modeling suggested that a modification to the existing well to increase yield or the installation of a new well at locations on the property closer to the Site could have an adverse impact on the groundwater contamination by inducing migration of the groundwater contamination. The restrictions on these properties will prohibit installation

Eastland Woolen Mill Partial Deletion Technical Memorandum

of future groundwater wells in locations or at depths that differ from existing water supply wells located on these properties. ICZ-C properties may continue to use their private water wells within this zone for domestic or other uses. There are two properties included in ICZ-C.

2.5. Response Action Completion

A key component of the Remedial Action was the connection of residences to an existing public water supply (the Corinna Water District). The water supply had been installed previously by others, and many of the residences and businesses in the area were already connected to it. Connection of residences to the water line was initiated in September 2005. The numerical modeling of bedrock groundwater flow and contaminant transport was done to evaluate the potential long-term migration of the bedrock plume under both pumping and non-pumping scenarios. Based on the results of ongoing bedrock groundwater monitoring and numerical groundwater modeling, it was determined that certain residences proximal to the Site, including Map 18 Lots 39, 43, and 52, were currently impacted by Site contaminants or had the potential to be impacted in the future. These residences were connected to the existing public water supply between September and December 2005. The extension of the water line, including the new connections resulting from implementation of the RA, is shown on Figure 10.

The RA also continued the ISCO program initiated by the NTCRA. In fall 2006, the Area 1/Phase III first full-scale ISCO injection and associated monitoring was implemented in the Phase III Area. A second full-scale ISCO injection and associated monitoring was also performed in the Phase II Area. In January 2007, confirmation soil and groundwater samples were collected to assess the first Phase III ISCO injection and the second Phase II ISCO injection. An area of newly discovered contamination was characterized from June 2007 through August 2007. This area was on the East side of the EBSR. Bedrock wells and associated borehole geophysics and groundwater sampling were performed to define this area. In August 2007 and September 2007 a Pilot-scale Phase IV fractured bedrock ISCO injection completed along with a second full-scale ISCO injection and associated monitoring was performed in the Phase III Area. A third full-scale ISCO injection and associated monitoring was performed in the Phase II Area. Additional groundwater and soil confirmation samples were obtained in 2007.

The Remedial Action activities were completed in 2008 as documented in the OU1 Interim Remedial Action Report and the September 2008 Preliminary Closeout Report. The OU1 component of the Site is now in the long-term response action component of the remedial action. The ongoing remedial action activities include: completion of the land use restrictions; long-term monitoring of groundwater and surface water; well decommissioning; site demobilization; and completion of the in-situ chemical oxidation program. A limited soil gas program is being implemented in 2012 to address soil vapor issues. The Remedial Action will be completed by 2018 when the State of Maine will take over the long term operation, maintenance, and monitoring requirements.

Eastland Woolen Mill Partial Deletion Technical Memorandum

2.6. Five Year Review

The assessment of the first five-year review performed in 2010 found that the remedy was constructed in accordance with the requirements of the Record of Decision (ROD) issued in 2002 and amended in 2006. The LTRA remedy is functioning as designed. As a result of the response actions at the Site, there is no current exposure to contaminants at the Site. A water line provides clean water and planned ICs will ensure appropriate future use of potentially contaminated groundwater. The remedy at the Eastland Woolen Mill Superfund Site currently protects human health and the environment because the contamination accessible to ecological receptors has been removed, there is no current human exposure to contamination, the groundwater contamination is not migrating, clean water is available to all locations within the extent of the groundwater contamination, and EPA is actively treating and monitoring the groundwater as part of the on-going Long-Term Response Action. However, in order for the remedy to be protective in the long-term, the institutional controls to prevent future groundwater use need to be in place to ensure long-term protectiveness. A preliminary assessment of the potential for vapor intrusion to present a threat at the Site was performed as part of this five-year review. There are no structures above areas of the plume that exceed vapor intrusion screening criteria so the pathway is not complete. Further investigations regarding the vapor intrusion pathway will be completed prior to the next five-year review. Further investigation regarding the vapor intrusion pathway will be completed on properties that are not subject to the partial deletion.

Since the completion of the five-year review, the institutional controls, in the form of restrictive environmental covenants, have been completed for the properties that will remain within the Site and the properties that are proposed for deletion. The only institutional controls that remain to be completed are for properties that are off-site. The groundwater under these remaining properties is not contaminated but a pumping well on these properties could cause the contaminated groundwater plume to expand. In addition, the properties proposed for deletion are not in the area where the vapor intrusion evaluation is being re-evaluated.

3. Partial Delisting

OSWER 9320.2-22, Close Out Procedures for National Priorities List Sites

Beginning in 1999, EPA adopted a streamlined approach to the process of deleting sites from the National Priorities List, called a Notice of Direct Final Action to Delete. With this approach, the Notice of Intent to Delete (NOID) and the Notice of Deletion (NOD) are published in the Federal Register on the same date. This combination of steps reduces the amount of time it takes to finalize a site deletion. Using this process, EPA will publish both a NOID and a Notice of Direct Final Action to Delete in the Federal Register. The Notice of Direct Final Action to Delete includes the statement that the direct final action will become effective unless EPA receives significant adverse or critical comments during the 30-day public comment period. If no significant adverse or critical comments are received, the deletion will become effective without any further EPA action and the site will be deleted from the NPL. Should significant adverse or critical comments be received within the comment period, EPA will publish a notice of withdrawal of the direct final rule, prepare a response to the comments received, and continue with the rulemaking process on the basis of the proposal to delete and the comments received.

Eastland Woolen Mill Partial Deletion Technical Memorandum

NPL Deletion Criteria

Section 300.425(e) (1) of the NCP provides that releases may be deleted from the NPL where no further response is appropriate. In making a determination to delete a release from the NPL, EPA shall consider, in consultation with the State, whether any of the following criteria have been met:

- i. responsible parties or other persons have implemented all appropriate response actions required;
- ii. all appropriate Fund-financed (Hazardous Substance Superfund Response Trust Fund) response under CERCLA has been implemented, and no further response action by responsible parties is appropriate; or
- iii. the remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, the taking of remedial measures is not appropriate.

Even if a site is deleted from the NPL, where hazardous substances, pollutants, or contaminants remain at the deleted site above levels that allow for unlimited use and unrestricted exposure, CERCLA section 121(c), 42 U.S.C. 9621(c) requires that a subsequent review of the site be conducted at least every five years after the initiation of the remedial action at the deleted site to ensure that the action remains protective of public health and the environment. If new information becomes available which indicates a need for further action, EPA may initiate remedial actions. Whenever there is a significant release from a site deleted from the NPL, the deleted site may be restored to the NPL without application of the hazard ranking system.

4. Data to Support Partial De-listing:

The OU I Record of Decision documented that the soil, sediment, and surface water for the entire OU I area, including the properties proposed for deletion, do not represent an unacceptable threat to human health. The OUI Record of Decision identified groundwater as the only remaining threat to human health after the NTCRA. Groundwater discharge to surface water was the only ecological threat identified for the OUI. The supporting data for the characterization of the area to be delisted can be found in both the RI Report and NTCRA Documentation. The properties targeted for deletion at the Eastland Woolen Mill Superfund Site do not contain soil or groundwater contamination above the Site-specific cleanup levels. These properties targeted for deletion and the properties that will remain within the Site boundaries are shown in Figure 11. Figure 11 also shows the current extent of groundwater contamination above Site-specific cleanup levels. Figure 12 shows the properties to be deleted along with the extent of the soil excavation as part of the NTCRA.

4.1 Properties proposed for deletion include:

Properties owned by the Town of Corinna that include properties described in Quitclaim Deed dated August 18, 1997 and recorded in Book 6471, Page 278, also identified as Lot 118 in Tax Map 18 dated 2004 and several additional properties that were part of the former Eastland Woolen Mill complex that were acquired due to a tax foreclosure. The tax foreclosure properties

Eastland Woolen Mill Partial Deletion Technical Memorandum

are described in the Penobscot County Registry of Deeds in Condemnation Order dated December 8, 1999 and recorded in Book 7251, Page 47 and a portion of the property has been subdivided in accordance with a plan dated October 19, 2004 and entitled, “Subdivision Plan for the Town of Corinna of Main Street Subdivision on Main Street, Hill Street & St. Albans Road in Corinna, County of Penobscot, Maine,” recorded in said Registry in Plan File 2004, No. 167 (the “Subdivision Plan”). Specifically subdivision Lots 2, 3, 4, 5, 6, 8, 9, 10, the portion of Subdivision Lot 1 north of the Central Maine Power property, and a portion of Lot 54 on Tax Map 18 along with Lot 53 on Tax Map 18 are proposed for deletion. The portions of Main Street and Hill Street within the subdivision are also proposed for deletion. Lot 53 on Tax Map 18 is also recorded in Book 853, Page 391 as a warranty deed dated September 26, 1913 and is known as “Winchester Park”.

Property owned by the State of Maine Department of Conservation identified in Release Deed dated December 5, 2003 Book 9114 page 194 also identified in Tax Map 18 as Map 15 Lot 10 (which a portion of the State of Maine Department of Conservation recreational trail that runs through the Town of Corinna).

Property owned by the State of Maine Department of Transportation described in a Notice of Layout and Taking dated May 3, 2000 and recorded in the Penobscot County Registry of Deeds in Book 7357, Page 29, and being generally depicted on the Survey Plan Showing Property Subject to Proposed Environmental Covenants for Maine Department of Environmental Protection, Corinna, Penobscot County, Maine which is recorded in the Penobscot County Registry of Deeds as Plan File 2012 No. 20 dated March 29, 2012, but excluding the portion of the Maine Department of Transportation property bounded by Town of Corinna Subdivision Lot 1, the East Branch of the Sebasticook River, Route 7, and Nokomis Road.

Property owned by Central Maine Power identified in indenture dated May 2, 1956 and recorded in the Penobscot County Registry of Deeds in Book 1532, Page 228, and generally depicted as Central Maine Power Company land in the Town of Corinna tax records as Lot 4 on Tax Map 20.

All Tax Map references are based on the 2004 Town of Corinna Tax Maps which are included in Attachment A. Attachment B is “Survey Plan Showing Property Subject to Proposed Environmental Covenants for Maine Department of Environmental Protection, Corinna, Penobscot County, Maine” and is recorded in the Penobscot County Registry of Deeds as Plan File 2012 No. 20 dated March 29, 2012. The March 29, 2012 plan shows the 2004 Subdivision Plan with the subdivision parcels and depicts the portion of Lot 54 on Tax Map 18 that will be subject to deletion and the portion that will remain within the Site.

4.2 Properties that will remain within the Site:

The properties that will remain within Eastland Woolen Mill Site after the partial de-listing include property described in the Penobscot County Registry of Deeds: Survey Plan as Lot 1, a portion of Tax Map 18 – Lot 54 (0.70 acres±) and Tax Map 18 – Lot 55 all of which are lands included in the Condemnation Order dated December 8, 1999 and recorded in Book 7251, Page 47. The Site will also include the land described in Quitclaim Deed dated October 26, 2004 and

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recorded in Book 9616, Page 201 and generally depicted in the Town of Corinna tax records as Lot 56 on Tax Map 18 and the only the portion of the property owned by the State of Maine Department of Transportation described in a Notice of Layout and Taking dated May 3, 2000 and recorded in the Penobscot County Registry of Deeds in Book 7357, Page 29, and being generally depicted on the Survey Plan Showing Property Subject to Proposed Environmental Covenants for Maine Department of Environmental Protection, Corinna, Penobscot County, Maine which is recorded in the Penobscot County Registry of Deeds as Plan File 2012 No. 20 dated March 29, 2012 that is bounded by Town of Corinna Subdivision Lot 1, the East Branch of the Sebasticook River, Route 7, and Nokomis Road. The portions of Route 7 where groundwater contamination remains above Site -specific cleanup levels will also remain within the boundary of the Eastland Woolen Mill Superfund Site.

4.3 Summary of Data Supporting Partial Deletion

The properties identified in the Town of Corinna subdivision plan as Lots 2, 3, 4, 5, 6, 8, 9, 10, the portion of Subdivision Lot 1 north of the Central Maine Power property, the portion of Tax Map 18 Lot 54 not remaining with the Site boundary, along with Lot 53 on Tax Map 18 and the property owned by Central Maine Power were not within the areas where substantial contamination was located. These properties contained open space, the dry processing portions of the former Eastland Woolen Mill, and office space. The concrete foundation where the dry processing of the woolen products was conducted was referred to as the “Slab Area” in the RI and NTCRA. The Slab Area is shown on Figure 3.

As part of the OU1 RI, five confirmation soil borings (SB-00-95 through SB-00-99) were completed within Slab Area (see Figure 5-5 of the RI). One additional soil boring, (SB-01-106), was installed as part of the NTCRA by Weston in 2001. Table 5-3 of the RI provides a summary of volatile organic compounds (VOCs) detected in these Slab Area soil borings. Low levels of several VOCs were detected. The concentrations were below levels of concern for human contact. A monitoring well pair was installed to determine if the 1,1-dichloroethene detected in the soil was present in groundwater downgradient of the Slab area. VOCs were not detected in groundwater downgradient of the Slab are confirming that this area was not a significant source of groundwater contamination.

The slab was not removed until after the ex-situ soil treatment phase of the NTCRA. Prior to the removal of the concrete pad, one sample was collected per 500 ft² using an excavator bucket to access the soil located below the concrete pad. A few areas with petroleum contamination were identified and these soils were removed to allow for Site restoration. A total of 176 samples were collected prior to concrete pad removal. A map showing the locations of these samples is presented in Figure 17 of Appendix J in the November 2006 Final Overall Completion Report for the NTCRA, and analytical results are presented in Table 27 of this report. All of the results from these initial 176 samples collected prior to the concrete pad removal confirmed that the soil concentrations were below the Site-specific cleanup levels. An additional five locations were sampled and characterized during concrete pad and footer wall removal due to staining or suspected contamination in the soil. Samples were analyzed for VOCs, DRO, polychlorinated biphenyls and/or metals based on the type and location of the staining. A summary of analytical results is shown in Table 28 of Appendix J in the November 2006 Final Overall Completion

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Report for the NTCRA, and sample locations are shown in Figure 18 of this report. Three of these locations contained Diesel Range Organic contamination. The contamination was removed because the soil was in an areas where grading was necessary.

In addition to the Slab Area, portions of the properties to be deleted were also used to store contaminated soil in a stockpile prior to treatment. After completion of the treatment of the contaminated soil 22 soil samples were collected below the contaminated soil stockpile to verify that the soil did not contain the COCs at levels above the site cleanup levels. A map detailing sample locations within the stockpile footprint is shown in Figure 16 of Appendix J in the November 2006 Final Overall Completion Report for the NTCRA. The analytical results for all samples collected from the below the stockpile footprint are presented in Table 26 of this report. Sample location 21, initially sampled on 9 October 2003, showed 1,2,4-TCB at levels above the project soil excavation goal of 5,000 microgram per kilogram ($\mu\text{g}/\text{kg}$). Therefore, a 6-inch layer of soil was removed from this grid of the stockpile footprint and processed through the LTTT system. A subsequent sample of this location was collected on 10 October 2003. Results from this sample were well below Site-specific cleanup levels.

In summary, the Town of Corinna subdivision lots 2, 3, 4, 5, 6, 8, 9, 10, the portion of Subdivision Lot 1 north of the Central Maine Power property, the portion of Tax Map 18 Lot 54 that is not remaining within the Site boundary, along with the property identified at Map 18 Lot 53 (Winchester Park) and the property owned by Central Maine Power were evaluated during the RI and NTCRA activities. The RI documented that the area was not a substantial threat to groundwater. The NTCRA sampling further documented that these properties do not contain soil contamination above the Site-specific cleanup levels.

Portions of the property owned by the State of Maine Department of Transportation, State of Maine Department of Conservation, and the Town of Corinna property described in Quitclaim Deed dated August 18, 1997 and recorded in Book 6471, Page 278, also identified as Lot 118 in Tax Map 18 dated 2012 were within the area subject to the excavation of contaminated soil and sediment as part of the NTCRA.

A portion of the State of Maine Department of Conservation property crossed the former Eastland Woolen Mill property near the area known as the pump house. The soil excavation and cleanup confirmation for this area can be found in Appendix H of the November 2006 Final Overall Completion Report for the NTCRA. Appendix H is titled: *Areas 1 and 4 Soil Remediation and River Restoration Final Completion Report, Eastland Woolen Mill Superfund Site, Corinna, Maine, February 2004*. Figures 2a-3b and Tables B-6 and B-7 document that the cleanup was successful for these properties.

A portion of the State of Maine Department of Transportation property that is proposed for de-listing was within the Area 1 excavation area. The soil excavation and cleanup confirmation for this area can be found in Appendix H of the November 2006 Final Overall Completion Report for the NTCRA. Appendix H is titled: *Areas 1 and 4 Soil Remediation and River Restoration Final Completion Report, Eastland Woolen Mill Superfund Site, Corinna, Maine, February 2004*. Figures 4a-4b and Tables B-9 document that the cleanup was successful for these properties.

Eastland Woolen Mill Partial Deletion Technical Memorandum

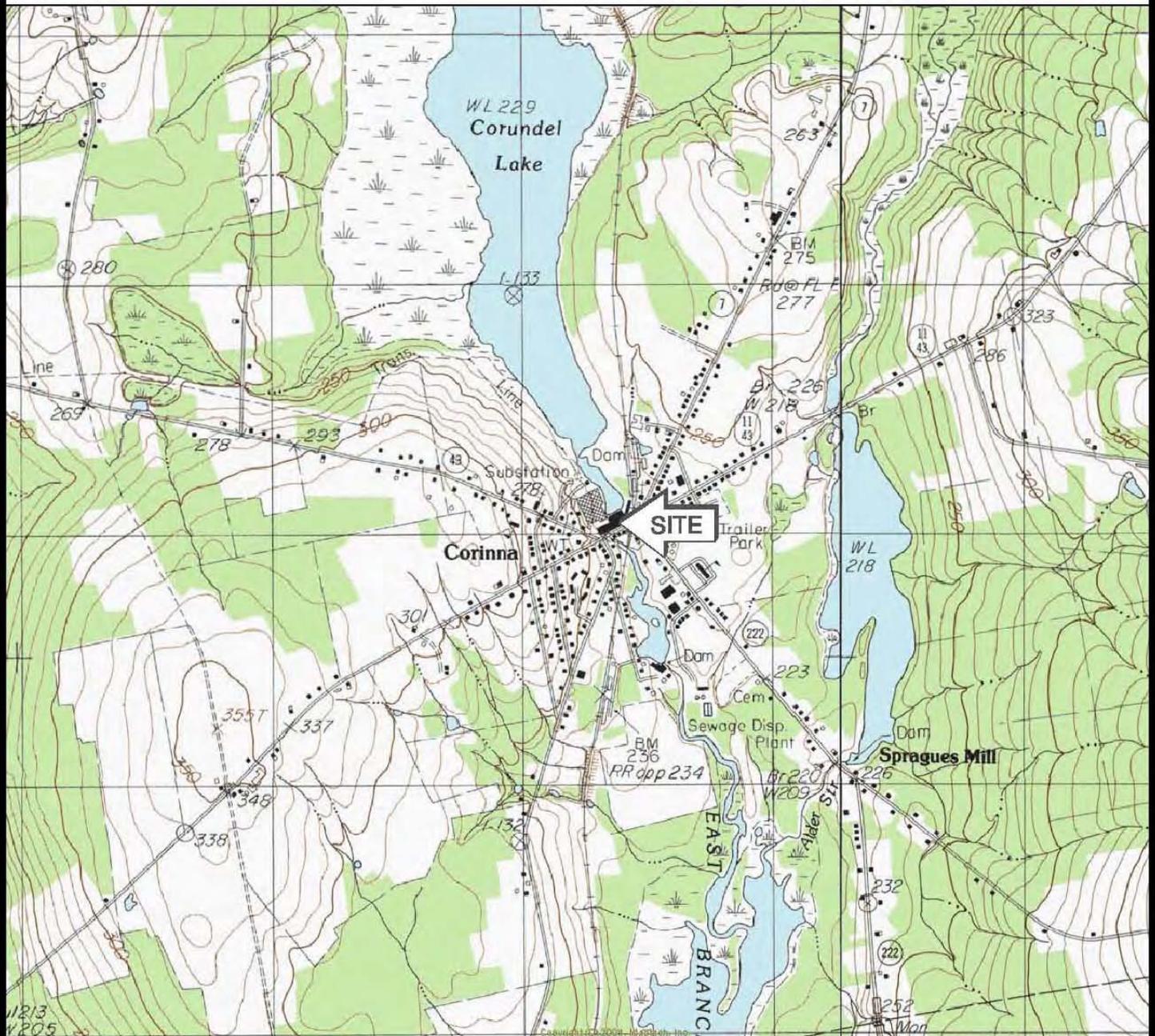
A portion of the State of Maine Department of Transportation, State of Maine Department of Conservation, and Town of Corinna property properties included the East Branch of the Sebasticook River. Appendix G in the November 2006 Final Overall Completion Report for the NTCRA documents the excavation and cleanup confirmation activities for these areas. Appendix G is titled: *Areas 2, 3, 4 – Lot 88, and 4 – Building 4 Soil Remediation Final Completion Report, Eastland Woolen Mill Superfund Site, Corinna, Maine, June 2001*. Specifically, Figures A-3A through A-4B and Tables B-7 and B-8 of Appendix G show the location and data which document that the cleanup was successful for these properties.

In summary, the property owned by the State of Maine Department of Conservation and the Town of Corinna property described in Quitclaim Deed dated August 18, 1997 and recorded in Book 6471, Page 278, also identified as Lot 118 in Tax Map 18 dated 2004 that are proposed for deletion no longer contain contamination above the Site-specific cleanup levels as documented by the completion report for the NTCRA. In addition, the State of Maine Department of Transportation property proposed for deletion no longer contains soil or groundwater contamination above Site-specific cleanup levels.

The portions of the State of Maine Department of Transportation property where groundwater contamination remains above Site-specific cleanup levels will remain within the boundary of the Eastland Woolen Mill Superfund Site. The portion includes the portion bounded by Town of Corinna Subdivision Plan Lot 1; the East Branch of the Sebasticook River, Route 7, and Nokomis Road along with the portions of Route 7 that contains soil or groundwater contamination above Site-specific cleanup levels.

5. Conclusion

This Partial Deletion Technical Memorandum for the Eastland Woolen Mill Superfund Site summarizes the information that is available in the Federal Docket for the partial deletion action. This Technical Memorandum presents the Figure showing the area subject to the deletion action (Figure 11) along with the area to remain within the boundaries of the Eastland Woolen Mill Superfund Site (Figure 11). EPA has determined that all appropriate Fund-financed (Hazardous Substance Superfund Response Trust Fund) response under CERCLA has been implemented, and no further response action by responsible parties is appropriate for the properties or portions of properties subject to the deletion action. The institutional controls for these properties are in place. In addition, groundwater monitoring and Site inspections associated with the area that will remain within the boundary of the Eastland Woolen Mill Site will support the five-year reviews to confirm that the Site response actions are protective of public health and the environment.



USGS TOPOGRAPHIC MAP

CORINNA, MAINE

1982

APPROXIMATE SCALE
1 INCH = 2,000 FEET

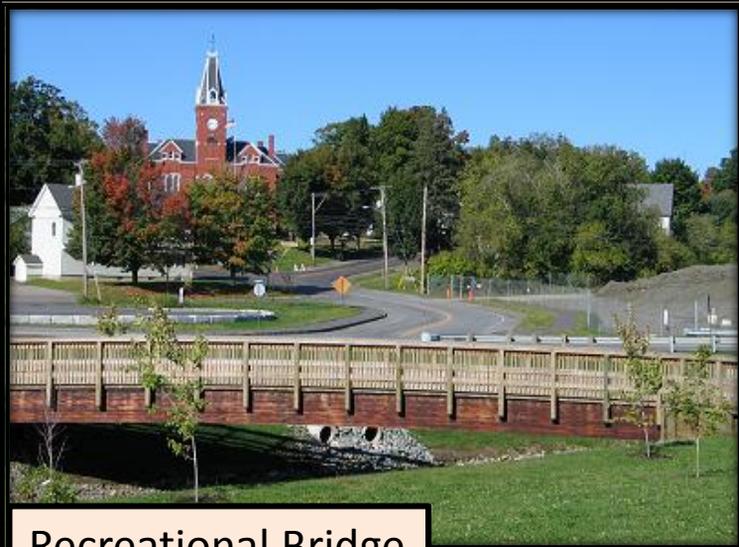


QUADRANGLE LOCATION

FIGURE 1
SITE LOCUS

EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM

Figure 2: Eastland Woolen Mill Superfund Site Current Reuse



Recreational Bridge



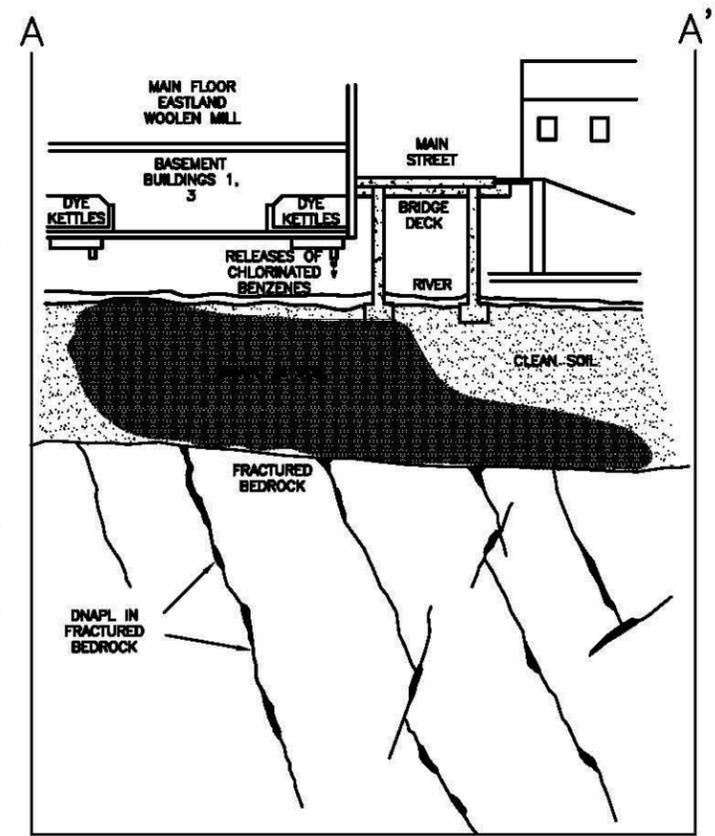
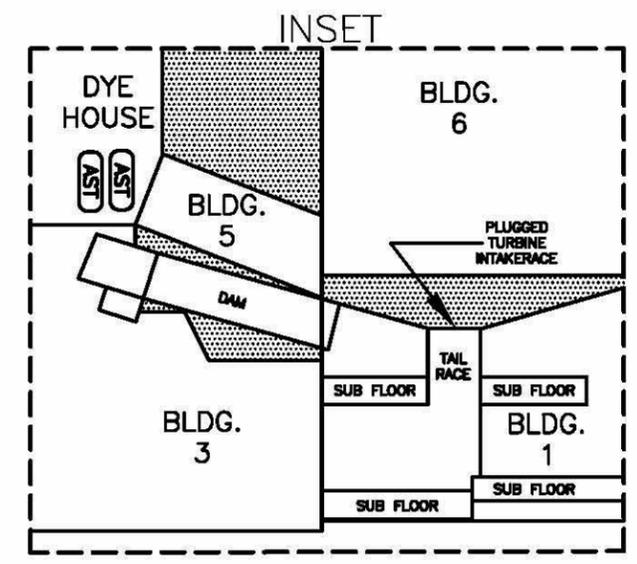
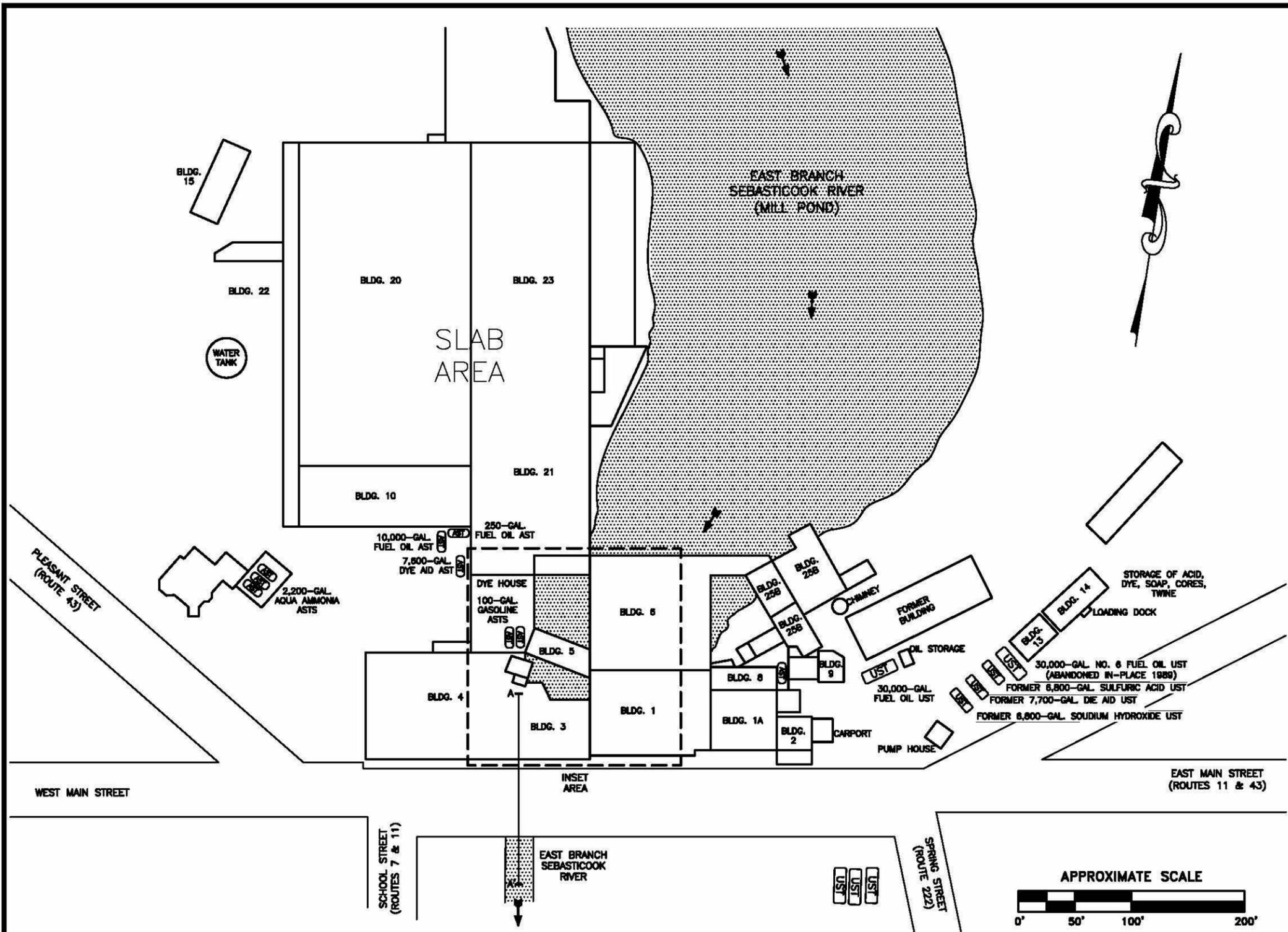
Community Bandstand
Donated by Emerson Family



Town of Corinna
War Memorial

Boardwalk for Community
Walking Trail

Corundel Commons
Housing Development



- NOTES**
1. THIS SITE SKETCH WAS DEVELOPED FROM VARIOUS PLANS SUPPLIED BY MACTEC OF PORTLAND, MAINE AND WAS COMPILED BY JAMES W. SEWALL COMPANY, BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS DATED APRIL 20, 1989.
 2. THIS MAP MEETS NATIONAL MAP ACCURACY STANDARDS FOR 1" = 100' MAPS WITH 2' CONTOURS.
 3. IN AREAS WHICH ARE OBSCURED BY VEGETATION OR PHYSICAL FEATURES, CONTOURS AND DETAIL MAY ONLY BE APPROXIMATE.
 4. HORIZONTAL DATUM IS NAD 1983, VERTICAL DATUM IS NAVD 1988.
 5. FIGURE REPRESENTS PRE-NTCRA ROADWAY CONFIGURATION.

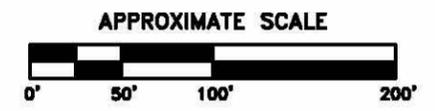
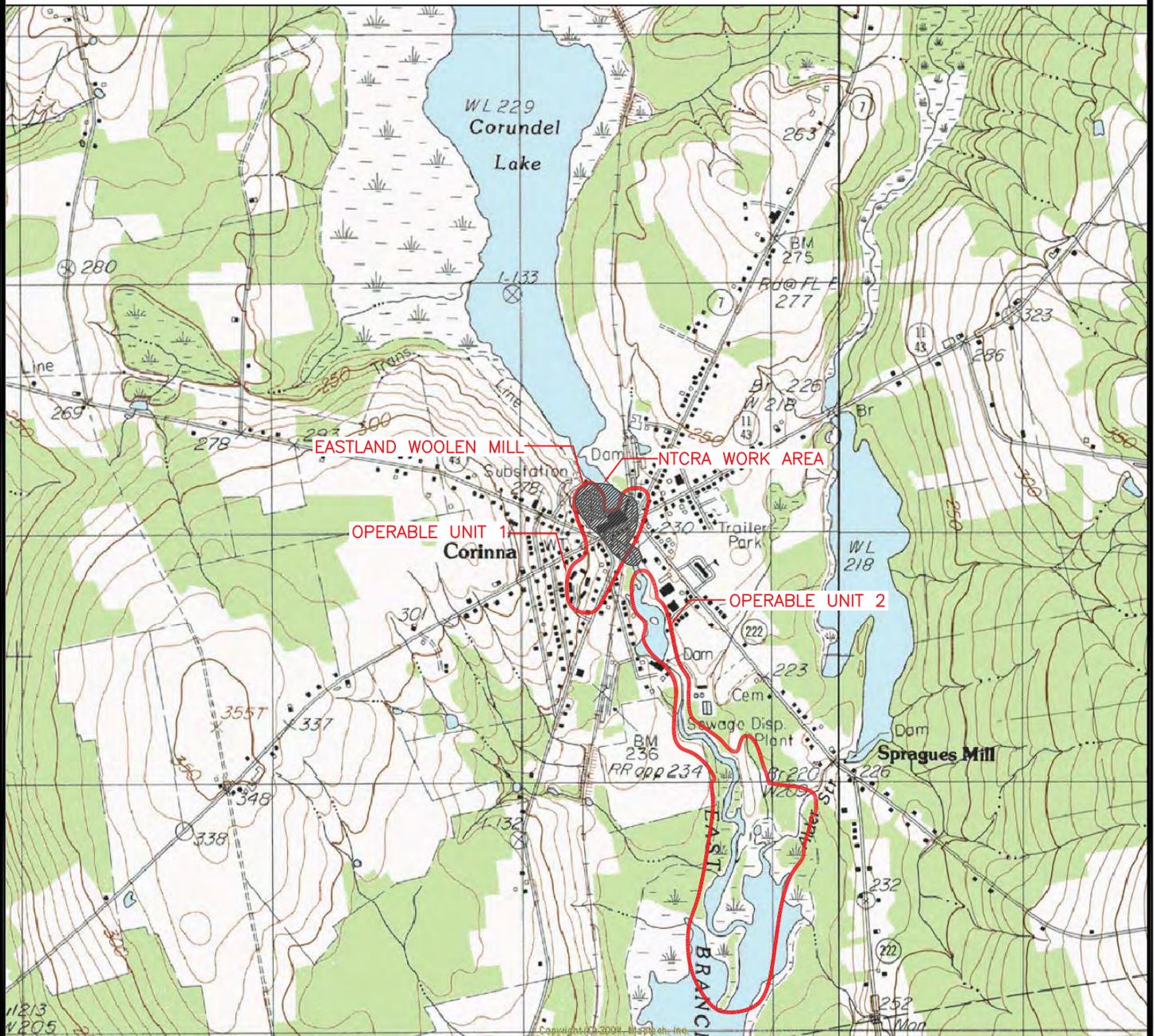


FIGURE 3
FORMER EWM COMPLEX
EASTLAND WOOLEN MILL PARTIAL DELETION TECHNICAL MEMORANDUM



USGS TOPOGRAPHIC MAP

CORINNA, MAINE

1982

APPROXIMATE SCALE
1 INCH = 2,000 FEET



FIGURE 4
LOCATION OF OPERABLE UNITS
EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM

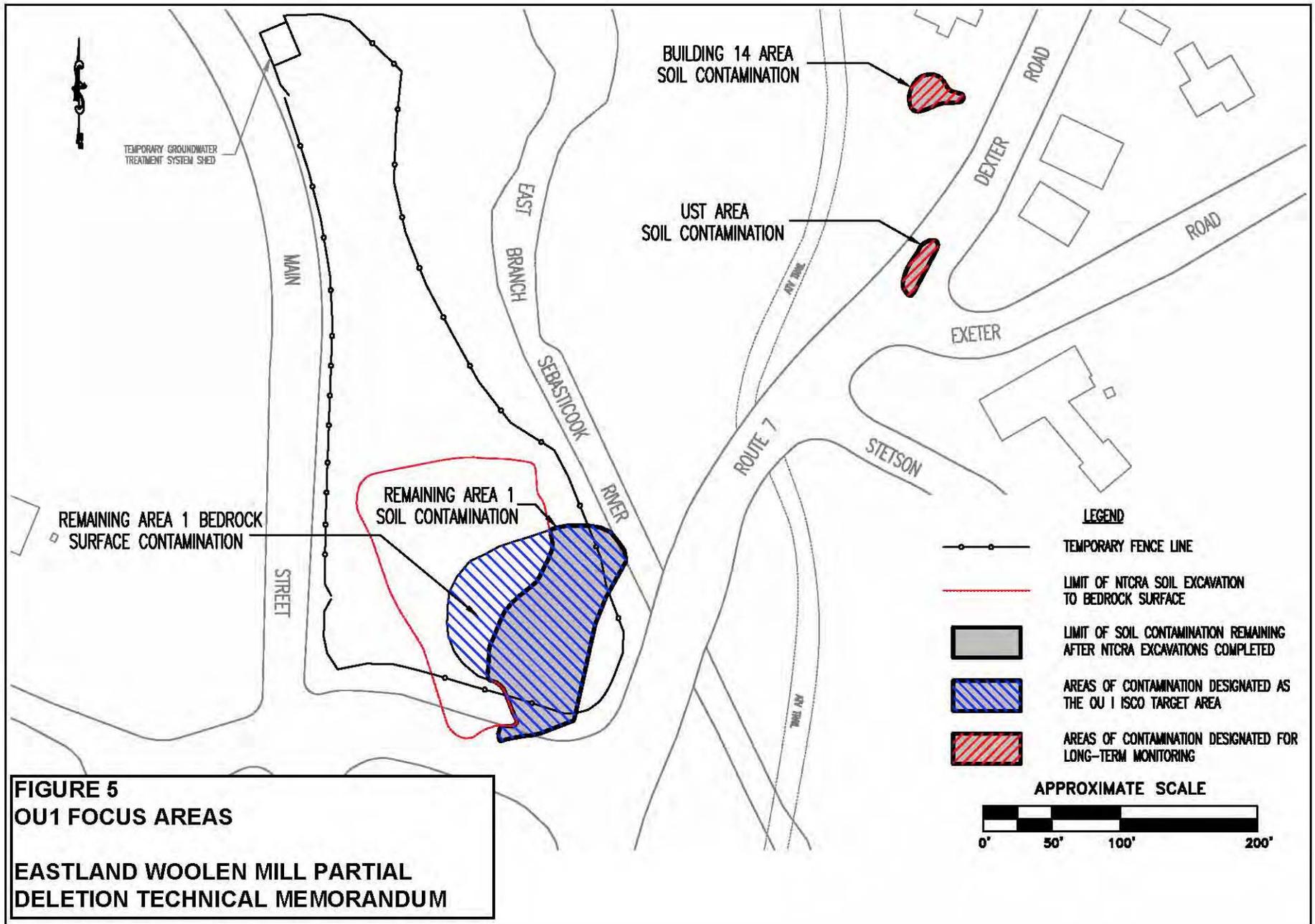
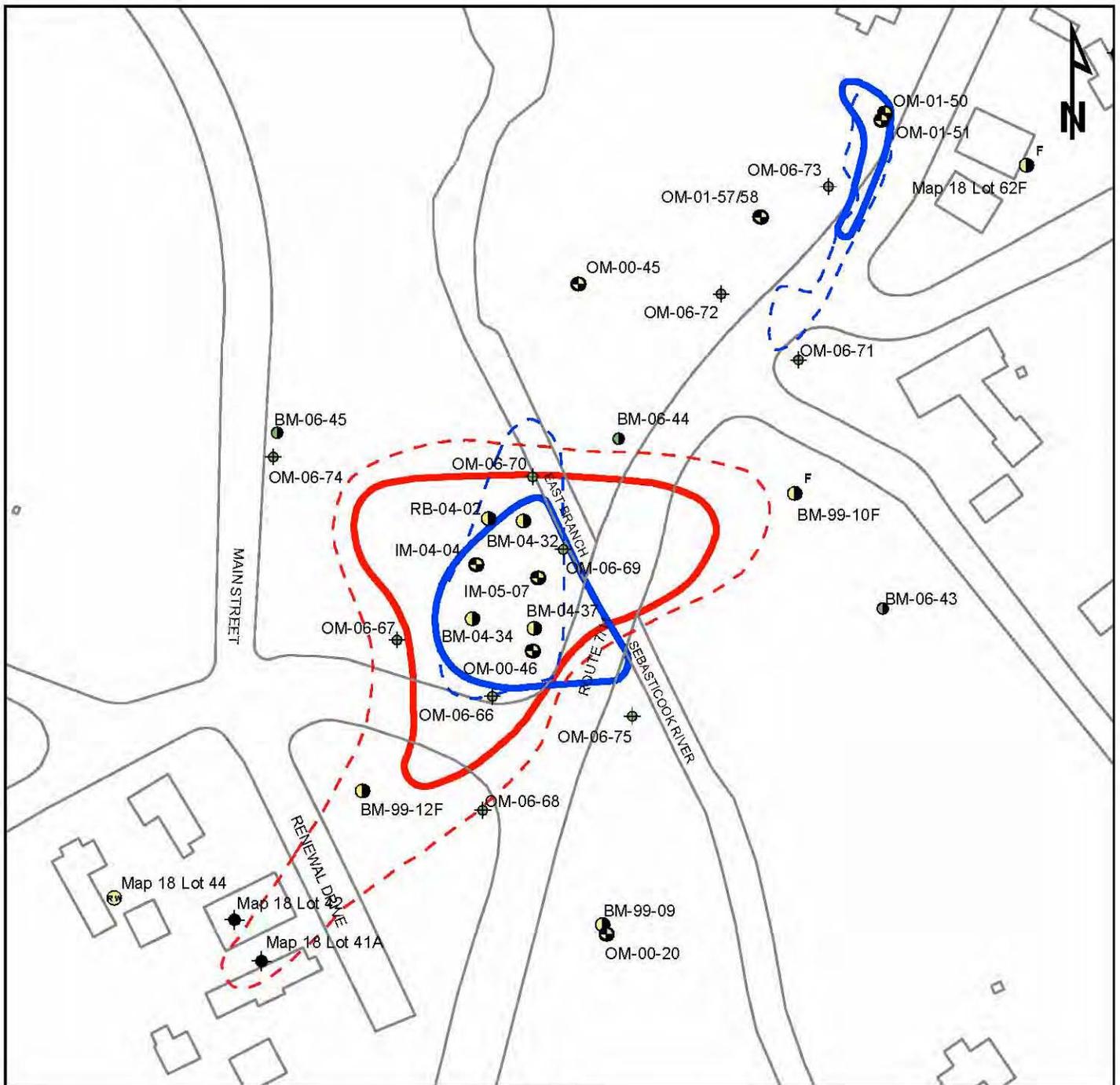


FIGURE 5
OU1 FOCUS AREAS
EASTLAND WOOLEN MILL PARTIAL DELETION TECHNICAL MEMORANDUM



Legend

- Estimated Limit of 2002 Chlorobenzene Compounds Detected at or Above Cleanup Levels in Overburden Groundwater
- Estimated Limit of 2002 Chlorobenzene Compounds Detected at or Above Cleanup Levels in Bedrock Groundwater
- Estimated Limit of 2005 Chlorobenzene Compounds Detected at or Above Cleanup Levels in Overburden Groundwater
- Estimated Limit of 2005 Chlorobenzene Compounds Detected at or Above Cleanup Levels in Bedrock Groundwater

- Existing Bedrock Long-Term Monitoring Location
- Existing Overburden Long-Term Monitoring Location
- F ● Existing Bedrock Flute-Well Monitoring Location
- Former Drinking Water Well Long-Term Monitoring Location
- Active Drinking Water Long-Term Monitoring Location
- ⊕ New Overburden Groundwater Monitoring Location
- New Bedrock Groundwater Monitoring Location

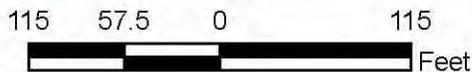


FIGURE 6
GROUNDWATER CONTAMINATION,
2002 VS. 2006
EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM

FORMER EASTLAND WOOLEN MILL
OPERABLE UNIT I

30,000-GALLON UST
EXCAVATION (AREA 4)

BUILDING 14

UST AREA

LOT 88

LOT 88 EXCAVATION
(AREA 4)

UST AREA EXCAVATION
(AREA 4)

BUILDING 9 EXCAVATION
(AREA 4)

AREA 1 EXCAVATION

BULK FUELS STORAGE AREA

AREA 2 EXCAVATION

AREA 25 EXCAVATION

AREA 3 EXCAVATION

SCHOOL STREET YARD

MOOSEHEAD MILL

OPERABLE UNIT II

OLD DUMP

LEGEND



RI-TARGETED AREAS



NTCRA EXCAVATION AREAS



LIMITS OF OPERABLE UNITS

APPROXIMATE SCALE



FIGURE 7
OU1, OU2, AND NTCRA WORK AREAS
EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM

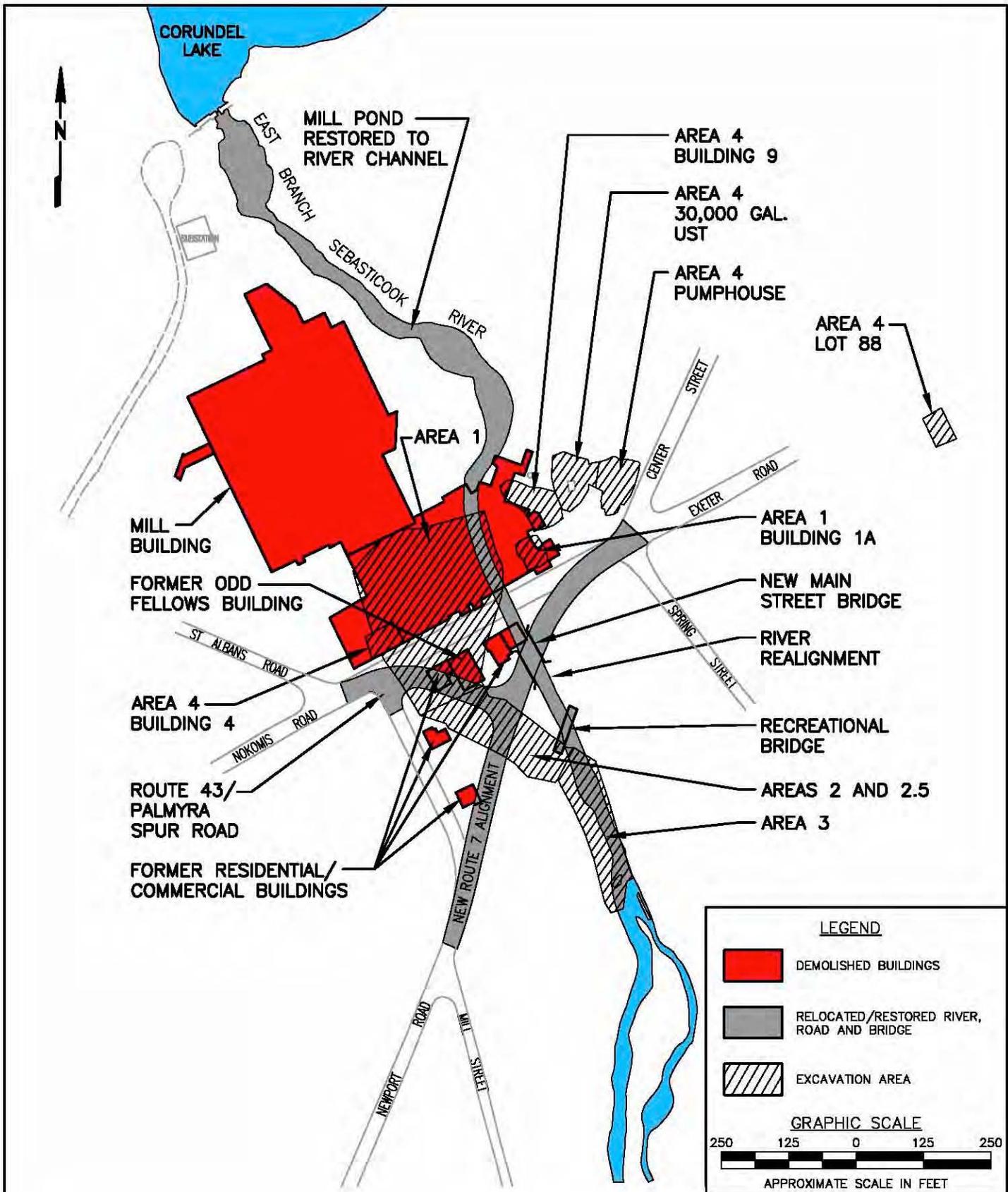
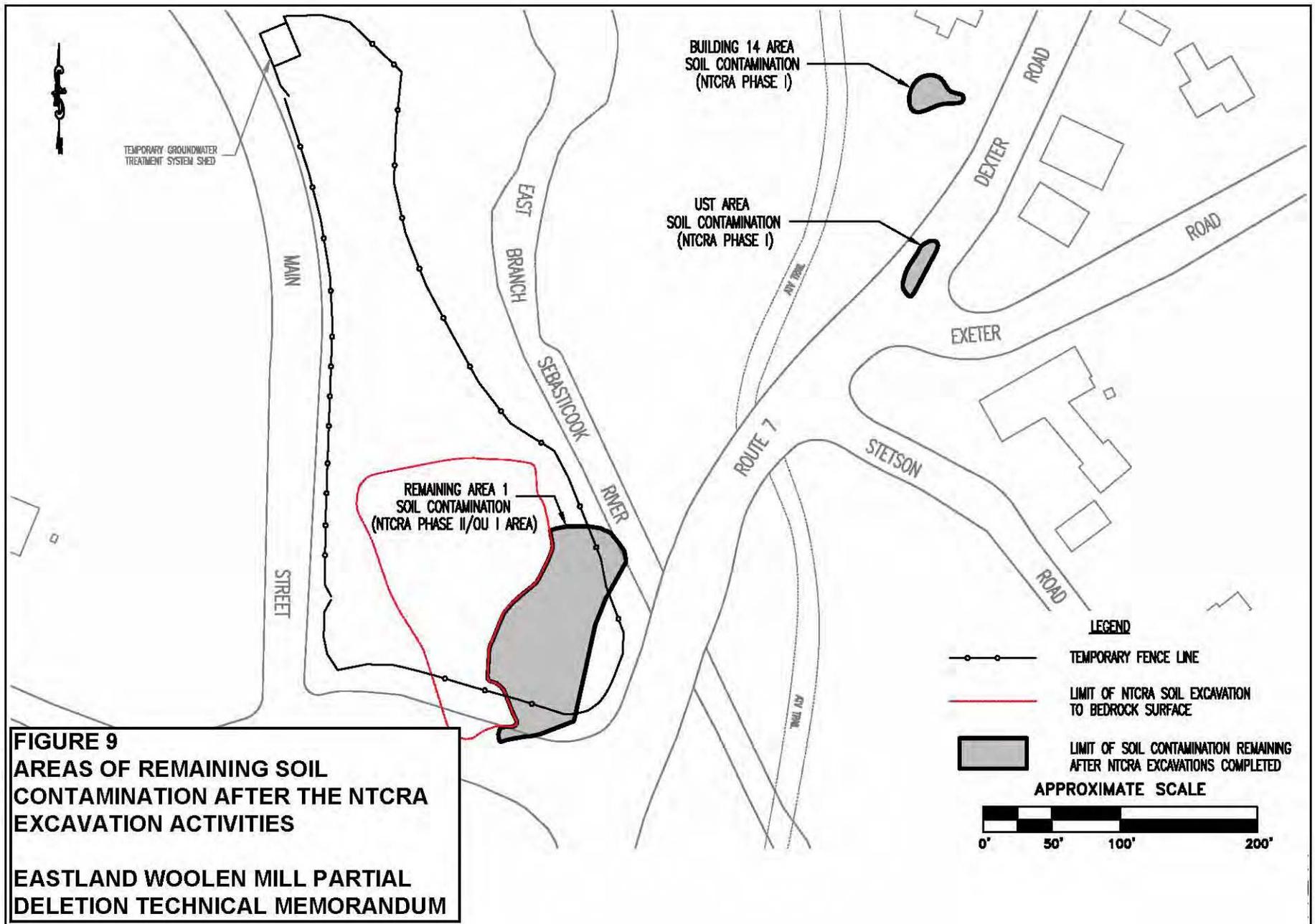


FIGURE 8
LOCATION OF MAJOR NTCRA ACTIVITIES
EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM



**FIGURE 9
AREAS OF REMAINING SOIL
CONTAMINATION AFTER THE NTCRA
EXCAVATION ACTIVITIES**

**EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM**

Legend

- Active Remediation Area: These properties to remain within Eastland Woolen Mill Superfund Site after partial deletion (Removal)
- These properties will no longer be within the boundaries of the Eastland Woolen Mill Superfund Site after partial deletion
- IC Area where properties outside of the Eastland Woolen Mill Superfund Site are being restricted to prevent expansion of the groundwater contaminant plume
- Properties where the current private drinking water supply well will remain in service, but no new wells can be installed
- Building supplied by private water supply well
- Building connected to public water supply during Remedial Action
- Public water supply line installed during Remedial Action
- Extent of the Institutional Control Zone

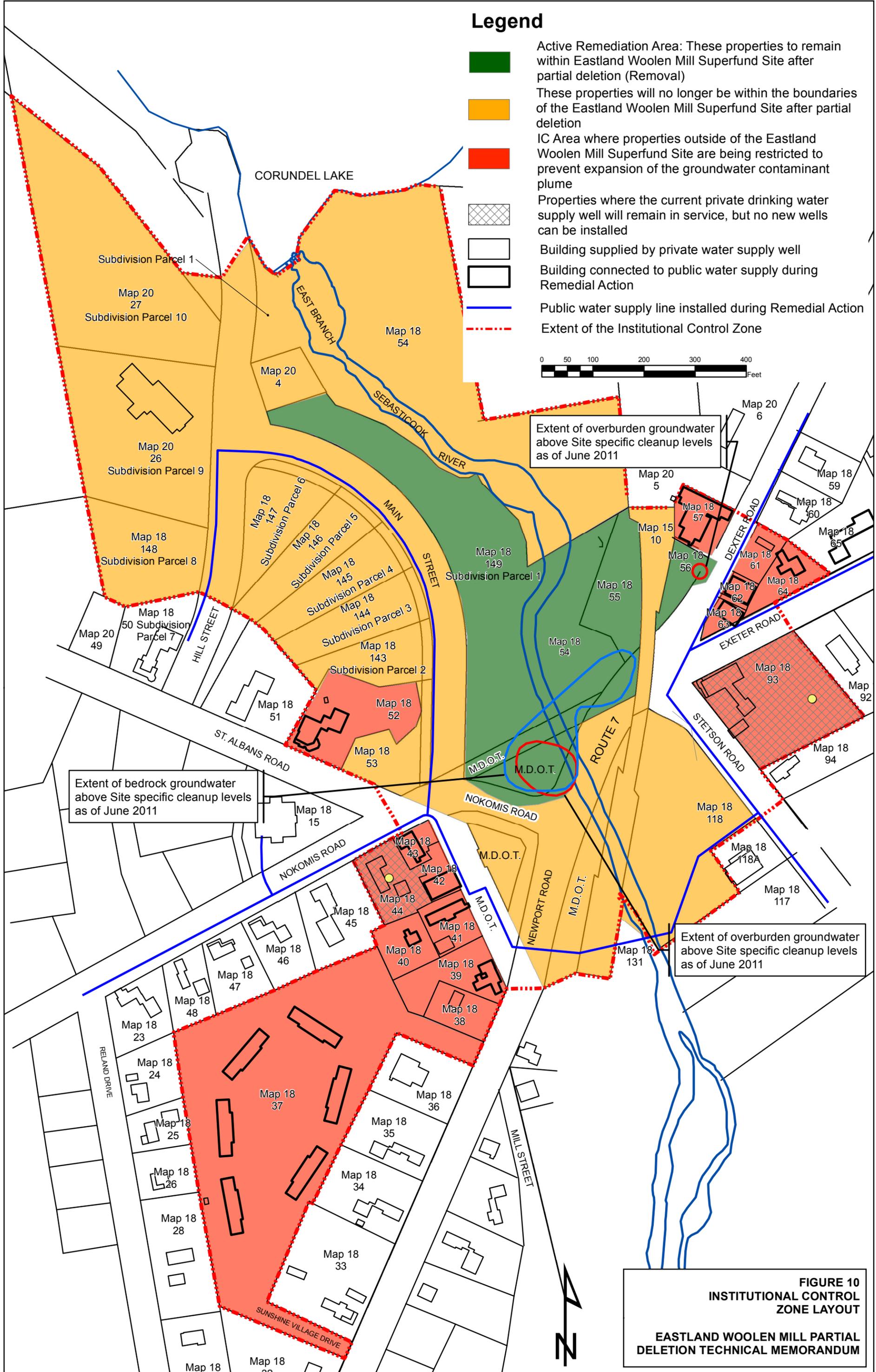


FIGURE 10
INSTITUTIONAL CONTROL
ZONE LAYOUT
EASTLAND WOOLEN MILL PARTIAL
DELETION TECHNICAL MEMORANDUM

Legend

These properties to remain within Eastland Woolen Mill Superfund Site after partial deletion (Removal)

These properties will no longer be within the boundaries of the Eastland Woolen Mill Superfund Site after partial deletion

Boundary of Eastland Woolen Mill Superfund Site after Partial Deletion

Properties Proposed for Deletion from Eastland Woolen Mill Superfund Site



CORUNDEL LAKE

EAST BRANCH

SEBASTICOOK

RIVER

MAIN STREET

HILL STREET

ST. ALBANS ROAD

NOKOMIS ROAD

RENEWAL STREET

NEWPORT ROAD

DEXTER ROAD

EXETER ROAD

STETSON ROAD

NOKOMIS ROAD

RELAND DRIVE

MILL STREET

SUNSHINE VILLAGE DRIVE

Extent of overburden groundwater above Site specific cleanup levels as of June 2011

Extent of bedrock groundwater above Site specific cleanup levels as of June 2011

Extent of overburden groundwater above Site specific cleanup levels as of June 2011



FIGURE 11
AREA TO BE DELETED AND REMAINING BOUNDARY OF SITE
EASTLAND WOOLEN MILL PARTIAL DELETION TECHNICAL MEMORANDUM

Legend

These properties to remain within Eastland Woolen Mill Superfund Site after partial deletion (Removal)

These properties will no longer be within the boundaries of the Eastland Woolen Mill Superfund Site after partial deletion



Areas of remaining soil contamination left in place

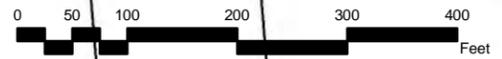
Limits of previously-completed NTCRA excavations



Boundary of Eastland Woolen Mill Superfund Site after Partial Deletion



Properties Proposed for Deletion from Eastland Woolen Mill Superfund Site



Extent of overburden groundwater above Site specific cleanup levels as of June 2011

Extent of bedrock groundwater above Site specific cleanup levels as of June 2011

Extent of overburden groundwater above Site specific cleanup levels as of June 2011

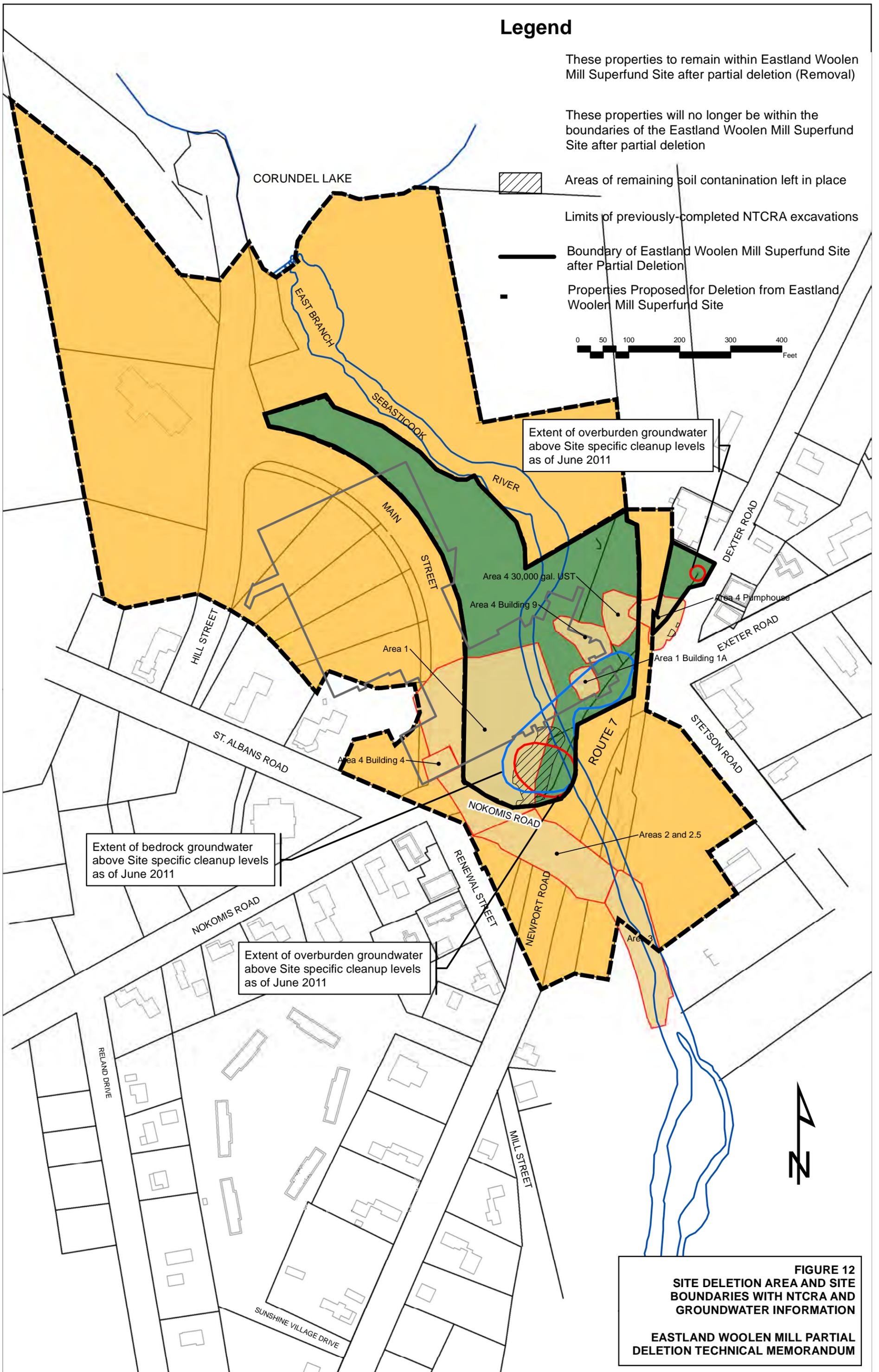


FIGURE 12
SITE DELETION AREA AND SITE BOUNDARIES WITH NTCRA AND GROUNDWATER INFORMATION
EASTLAND WOOLEN MILL PARTIAL DELETION TECHNICAL MEMORANDUM

ATTACHMENT A

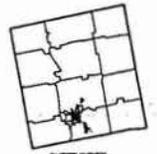
TAX MAP 18 OF CORINNA MAINE



LEGEND

- PROPERTY LINE
- DEVELOPER'S LOT LINE
- RIGHT-OF-WAY
- UNIMPROVED R/W
- MATCH LINE
- PARCEL NUMBER
- PART OF PARCEL
- SUBDIVISION LOT NUMBER
- DIMENSIONS
- SCALE DIMENSION
- WETLAND LINE
- CITY/TOWN LIMIT
- RAILROAD RIGHT-OF-WAY
- EASEMENT
- WATER BODY

THIS MAP IS PREPARED FOR THE PURPOSE OF TAXATION. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE TOWN ENGINEER HAS CONDUCTED A VISUAL INSPECTION OF THE MAP AND HAS FOUND IT TO BE CORRECT. THE TOWN ENGINEER HAS CONDUCTED A VISUAL INSPECTION OF THE MAP AND HAS FOUND IT TO BE CORRECT. THE TOWN ENGINEER HAS CONDUCTED A VISUAL INSPECTION OF THE MAP AND HAS FOUND IT TO BE CORRECT.



SHEET INDEX

SCALE: 1" = 100'



DATE OF REVISION:

A-58	
A-59	
A-60	

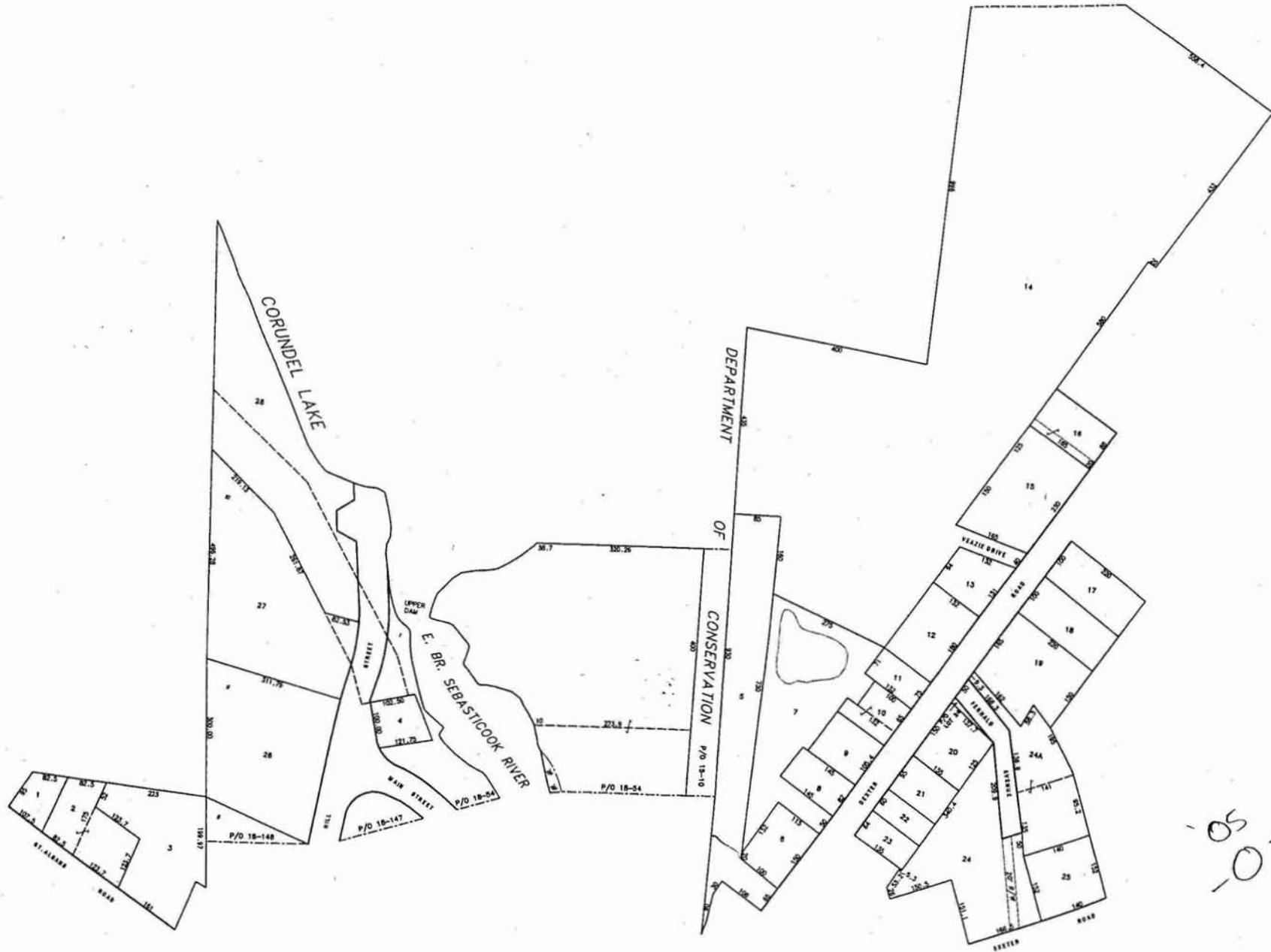
JAMES W. SEWELL COMPANY
TOWN ENGINEER

17

20

15

18



**TAX MAP
20
OF
CORINNA
MAINE**



LEGEND

- PROPERTY LINE
- DEVELOPER'S LOT LINE
- RIGHT-OF-WAY
- - - UNIMPROVED R/W
- - - MATCH LINE
- J PARCEL NUMBER
- P/O PART OF PARCEL
- 75% SUBDIVISION LOT NUMBER
- 18 DIMENSIONS
- 18(S) SCALE DIMENSION
- - - WETLAND LINE
- CITY/TOWN LIMIT
- RAILROAD
- RIGHT-OF-WAY
- EASEMENT
- WATER BODY

THIS MAP IS PREPARED FOR THE PURPOSE OF TAX ASSESSMENT AND IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE TOWN OF CORINNA, MAINE, HEREBY CERTIFIES THAT THE INFORMATION CONTAINED HEREON IS TRUE AND CORRECT TO THE BEST OF ITS KNOWLEDGE AND BELIEF. THE TOWN OF CORINNA, MAINE, ACCEPTS THE LEGAL RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION CONTAINED HEREON.



SHEET INDEX



DATE OF REVISIONS:

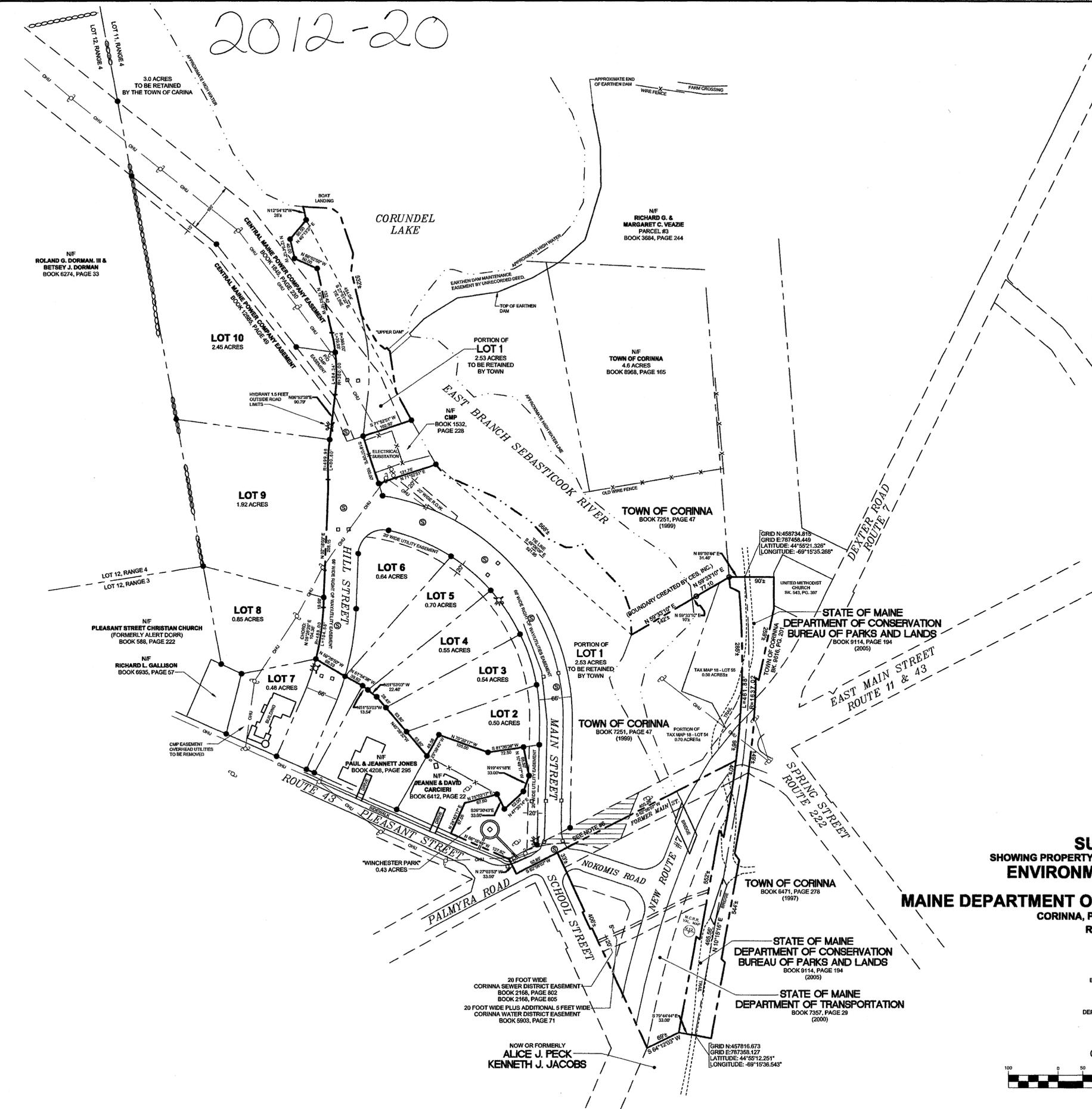
DATE	REVISIONS
6-10-1	
6-10-2	
6-10-3	

JAMES W. SPENCER COMPANY
Surveyors and Engineers, Inc. 100 Main Street, Corinna, Maine 04958

350

ATTACHMENT B

2012-20



PLAN REFERENCES:

- STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, STATE HIGHWAY "37" (RTE. 711), CORINNA, PENOBSCOT COUNTY, FEDERAL AID PROJECT NO. STP-771(00)X PART 1, DATED APRIL, 2000 & DECEMBER 2003, D.O.T. FILE NO. 10-394, SHEETS 5,6,7 AND 8, RECORDED IN PLAN BOOK 2007, PAGES 121 & 122.
 - SUBDIVISION PLAN FOR THE TOWN OF CORINNA OF MAIN STREET SUBDIVISION ON MAIN STREET, HILL STREET & ST. ALBANS ROAD IN CORINNA, COUNTY OF PENOBSCOT, MAINE, DATED OCTOBER 19, 2004, PREPARED BY WEBBER SURVEYING, INC. AND RECORDED IN PLAN BOOK 2004, PAGE 167.
- NOTES:**
- SOURCE DEEDS:
 - NOTICE OF LAYOUT AND TAKING BY THE STATE OF MAINE DEPARTMENT OF TRANSPORTATION DATED MAY 3, 2000, RECORDED IN BOOK 7357, PAGE 29.
 - CONDEMNATION ORDER EXECUTED BY THE TOWN OF CORINNA OF THE FORMER EASTLAND WOOLEN MILL, INC. DATED DECEMBER 8, 1999, RECORDED IN BOOK 7251, PAGE 47.
 - RELEASE DEED FROM MAINE CENTRAL RAILROAD COMPANY TO STATE OF MAINE, DEPARTMENT OF CONSERVATION, BUREAU OF PARKS & LANDS DATED DECEMBER 5, 2003, RECORDED IN BOOK 9114, PAGE 194.
 - ALL BOOK AND PAGE NUMBERS REFER TO THE PENOBSCOT COUNTY REGISTRY OF DEEDS.
 - THE DIRECTION OF LINES AND UNDERLYING COORDINATE SYSTEM IS BASED UPON THE MAINE STATE PLANE COORDINATE SYSTEM, EAST ZONE NAD 83 DATUM.
 - SURVEY CONTROL POINTS WERE PROVIDED TO CES, INC. BY THE MAINE DEPARTMENT OF TRANSPORTATION.
 - THIS PLAN REPRESENTS A DIGITAL COMPILATION OF INFORMATION SHOWN ON PLAN REFERENCES 1 & 2. THE PURPOSE OF THIS PLAN IS TO FACILITATE THE PREPARATION OF LEGAL DESCRIPTIONS OF AREAS THAT WILL BE SUBJECT TO CERTAIN RESTRICTIVE COVENANTS TO BE PLACED ON THESE AREAS BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
 - A NOTATION APPEARS ON PLAN REFERENCE #1 INDICATING A "PETITION FOR DISCONTINUANCE PREPARED DECEMBER 2008". AN INQUIRY WAS MADE TO THE CORINNA TOWN MANAGER (DALTON MULLIS) ABOUT THE SAID DISCONTINUANCE. MR. MULLIS INDICATED THAT HE IS NOT AWARE OF ANY OFFICIAL DISCONTINUANCE AND THE TOWN HAS NO SUPPORTIVE DOCUMENTATION OF SUCH. IN ACCORDANCE WITH TITLE 33, SECTION 465 OWNERSHIP OF ABUTTING LAND OWNERS ARE SHOWN TO THE CENTERLINE OF THE FORMER LOCATION OF MAIN STREET.

LEGEND:

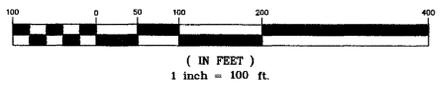
- IRON ROD OR PIPE SHOWN ON PLAN REF. #2
- 5/8" CAPPED IRON ROD SET (P.L.S. #2292)
- ⊙ UTILITY POLE
- ⊙ SEWER MANHOLE
- ⊙ CATCH BASIN
- ⊙ FIRE HYDRANT
- PROPERTY LINE
- - - APPROXIMATE PROPERTY LINE
- - - CENTERLINE
- - - EASEMENT LINE
- - - APPROXIMATE HIGH WATER LINE
- - - OVER-HEAD UTILITIES
- ⊘ STONEWALL
- WIRE FENCE
- - - APPROX. EDGE OF TRAIL
- NF NOW OR FORMERLY

SURVEY PLAN
 SHOWING PROPERTY IN CORINNA SUBJECT TO PROPOSED
ENVIRONMENTAL COVENANTS
 PREPARED FOR
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CORINNA, PENOBSCOT COUNTY, MAINE

RECORD OWNERS:

- TOWN OF CORINNA
8 LEVI STEWART DRIVE
CORINNA, ME 04928
- STATE OF MAINE
DEPT. OF CONSERVATION
BUREAU OF PARKS AND LANDS
22 STATE HOUSE STATION
AUGUSTA, ME 04333
- STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, ME 04333

SEPTEMBER 20, 2011
GRAPHIC SCALE



CES INC
 ENGINEERING • SURVEYING • PLANNING • SCIENCES
 145 S. Main Street
 PO BOX 639
 Auburn, ME
 04213-0639
 F. 207-794-8414
 F. 207-888-4891
 1866 State Hwy 102
 Bar Harbor, ME
 04719-0088
 F. 207-255-3270
 F. 207-255-6387
 WWW.CES-MAINE.COM

2012-20

PROJECT TITLE
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
CORINNA, PENOBSCOT COUNTY, MAINE

SHEET TITLE
SURVEY PLAN SHOWING PROPERTY IN CORINNA
SUBJECT TO PROPOSED ENVIRONMENTAL COVENANTS

REV.	DATE	DESCRIPTION	BY	CHECKED BY
RS	3/29/12	Per MDOT & MDEP comments	JH	JH
RS	3/29/12	Per MDOT's comments	JH	JH
RS	2/24/12	Per CMP comments, other misc.	JH	JH
RS	2/21/12	Per MDEP comments	JH	JH
RS	1/24/12	Per MDEP comments	JH	JH
RS	1/24/12	Per MDEP comments	JH	JH
RS	1/24/12	Per MDEP comments	JH	JH
RS	1/24/12	Per MDEP comments	JH	JH
RS	1/24/12	Per MDEP comments	JH	JH
RS	1/24/12	Per MDEP comments	JH	JH

STATE OF MAINE
 PENOBSCOT, SS.
 REGISTRY OF DEEDS
 RECEIVED AND FILED
 March 29 2012
 12:54 P.M.
 Susan F. Bulley
 Registered Professional
 RECORDED AS MAP FILE:
 2012-20

SCALE

DATE

DRAWN BY JH & B

DESIGNED BY

APPROVED BY

JOB NUMBER 6258

DRAWING NUMBER

1 OF 1