Environmental Impact Evaluation
Durham Water System Extension
Durham, Connecticut

Prepared in accordance with the Connecticut Environmental Policy Act

Sponsoring Agency: **State of Connecticut Department of Energy and Environmental Protection**

September 2009
Revised September 2010
Final Update November 2012

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EXECUTIVE SUMMARY

1.1 Project Identification

Extension of the existing public water system from the City of Middletown into the areas of Durham to address contaminated groundwater as identified in the Environmental Protection Agency's Record of Decision and other areas identified in the previous Feasibility Study Update will be investigated herein.

1.2 Summary of Environmental Review

This Environmental Impact Evaluation is prepared pursuant to Section 22a-1b of the Connecticut General Statutes and Section 22a-1a-10 of the Regulations of Connecticut State Agencies for the extension of an existing water system in Middletown to Durham Center. An engineering report entitled "Durham Water System Extension Feasibility Study" dated May 2000 was updated by Fuss & O'Neill in 2009. Final revisions were completed in November 2012. The original Feasibility Study investigated areas that would be serviced due to public health concerns resulting from contaminated groundwater emanating from the Superfund site and other sites in Town. The identified problem areas are depicted in **Figure ES-1**.

The original study included the recommendation of extending Middletown's water main along Route 17 into Durham. The base case in the study included piping to supply drinking water to properties within the Superfund Site area only. The water supply wells in the Superfund area were contaminated, or threatened, by releases from the former Merriam Manufacturing site and the operating Durham Manufacturing site. Various other areas were considered for service in Town based on other documented contamination (See **Figure ES-2**). The provision of fire protection and connecting the main to the Durham Center Water System were also considered as options (See **Figure ES-3**). The current study is updating the information and cost estimates from the 2000 study.

The updated engineering report attached to this evaluation developed recommendations for addressing the groundwater contamination in the areas discussed in previous reports and included scenarios (groups of areas) that were developed for this report and investigated. At a minimum, the water distribution system will include the Superfund Site (Area A). This area will be sized to provide domestic service only; no fire protection will be included. The system will incorporate the looping of mains to provide reliable, consistent pressure and supply (See **Figure ES-4)**.

As a result of the investigation, the recommended water distribution system to be implemented is shown on **Figure ES-5**. In addition to the Superfund Site, the report recommends three other areas of the Core Service Area scenario be served. This includes Areas B, C and D. Further, the Town of Durham has recognized a need for improved fire protection; therefore, the provision of fire protection was included in the analysis for projecting water demands (determined to be approximately 800,000 gallons per day) and sizing equipment and improvements needed for the extension of Middletown's existing Water System. Further, the

budgetary opinion of capital cost for the water main extension also included costs associated with providing fire protection to the area.

1.3 Department of Energy and Environmental Protection Information

This Environmental Impact Evaluation is being prepared to facilitate the expenditure of grants awarded to the Town of Durham, which is administered by the Connecticut Department of Energy and Environmental Protection (CTDEEP, formerly CTDEP). The agency contact for this project is:

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1 Description of Proposed Action

Several water quality issues and the need for improved fire protection has prompted the Town of Durham to consider the extension of public water supply into the center of Town. An existing Durham Center Water Supply owned by the Town and is currently operated by Connecticut Water Company (CWC) reportedly does not have the capacity and facilities to address both contaminated groundwater and fire protection needs of the Town of Durham. The City of Middletown currently has excess capacity available in their municipal system in the short term, and in the long term with the replacement of Well No. 1 and Well No.3 (as described in Feasibility Study Final Update dated November 2012). The City has indicated they are prepared to assist the Town in addressing public health and safety needs of the community.

The Town of Durham has secured funding from the State of Connecticut to update the original feasibility study to extend the existing water system from Middletown into the Durham center area where individual wells have been contaminated. **Figure 1-1 and 1-2** are site location maps of the approximate limits of the study area which is intended to address documented areas of contaminated groundwater. The feasibility study addresses the technical feasibility of extending water service for both domestic purposes and fire protection to these areas. **See Appendix A** for the final updated version of the "Durham Water System Extension Feasibility Study Upgrade" dated November 2012.

2 Purpose and Need

2.1 Purpose

Water quality issues have prompted the Town of Durham to consider alternative sources of potable water for Durham Center. The groundwater contamination problems prevent property owners from obtaining a safe and reliable supply of potable water from their existing individual wells.

The purpose of the proposed water main extension is to provide a safe and reliable source of potable water for residences, businesses, and public buildings located in the Superfund Site Area (base case). The main can also serve other areas with documented groundwater contamination and could possibly provide fire protection for these areas of Durham if funding or monies are available.

2.2 Need

The need for the water main extension is due to groundwater contamination from various activities that have impacted existing groundwater supply wells. Certain wells in the study area are part of the Durham Meadows Superfund Site. As outlined in the Record of Decision issued by the United States Environmental Protection Agency (USEPA) in September 2005, USEPA's selected remedy for the site-wide area of groundwater contamination at the Durham Meadows Superfund Site is an extension of the Middletown Water Distribution System from the City of Middletown to all residences currently affected by groundwater contamination and a buffer zone of residences located near the contaminated area.

The areas shown in **Figure 2-1** are described below. In addition to the contamination, the existing Durham Center Water System, currently owned by the Town and operated by Connecticut Water Company (CWC), is depicted. This system reportedly does not have the capacity and facilities to address both contaminated groundwater and fire protection needs for the Town of Durham, necessitating an alternate source of potable water.

As outlined in USEPA's Record of Decision dated September 30, 2005, and in the letter from the USEPA to the Town (See **Appendix B**), USEPA's selected remedy for the site-wide area of groundwater contamination at the Durham Meadows Superfund site is the extension of the Middletown Water Distribution System from the City of Middletown south along Route 17 to all residences currently affected by groundwater contamination and included in a buffer zone of residences around the contaminated area. USEPA prefers this alternative because it provides the most long-term, effective solution to address the risk to human health at all affected and surrounding wells within the Superfund Site. At the time, USEPA's Record of Decision was issued; it was also EPA's understanding that the Middletown Water Distribution System had the capacity to serve the Superfund Site. Such an extension may be able to address other contaminated areas within the Town as described below.

2.2.1 Durham Meadows Superfund Site (Area A)

The Durham Meadows Superfund Site includes an area of groundwater contamination generally centered on Main Street from both the former Merriam Manufacturing Company, Inc. (MMC) located at 281 Main Street and Durham Manufacturing Company (DMC), an operating manufacturing facility located at 201 Main Street. The site includes historic Main Street in Durham Center and contains industrial and residential properties. The site is generally bounded by Talcott Lane to the North; Brick Lane, Ball Brook and Allyn Brook to the East; Allyn Brook to the south; and wetlands off Maple Avenue to the west.

The Superfund Site area includes approximately 109 properties (89 are residential, 9 are vacant and the remaining 11 properties include commercial, industrial and municipal facilities) of which approximately 38 wells are contaminated and are maintaining filter treatment systems.

2.2.2 Additional Problem Areas

- *MTBE Contamination Area along Main Street (Area B)*
  Contamination in this area is related to current and former releases at gas stations. The MTBE groundwater contamination problem has been discovered in potable wells in this area. The area of contamination is centered along Main Street between Middlefield Road and Talcott Lane. The MTBE site area (Area "B") includes approximately 15 properties of which one is residential, one is vacant and the remaining 13 properties include commercial and industrial buildings.

- *1,1-Dichloroethylene (1,1-DCE) Area (Area C)*
  This area is north and west of the Durham Meadows Superfund Site, close to the intersection of Middletown Road and Maple Avenue. Contamination in this area may be related to the Superfund Site, the MTBE area (Area B), or the former Parsons Manufacturing Company. The 1, 1 DCE contamination area

(Area "C") includes approximately 22 properties of which 21 are residential and one is vacant.

- *The Parsons Area (Area D)*
  This area is north of Area C and lies along the west side of Main Street (Route 17). VOC's have been detected in some of the wells. Not all of the contamination in this area can be attributed to the former Parsons Manufacturing Company. The Parsons Area (Area D) includes approximately 37 properties of which 28 are residential, 8 are designated commercial or industrial and one is vacant.

- *The Schools Area (Area E)*
  This area includes the Coginchaug Regional High School, the Korn Elementary School and the Frank W. Strong Middle School. The schools are located on Pickett lane and lie just to the east of the Durham Manufacturing facility. The area also includes some private residences along Maiden Lane, a small chicken farm and residence that is to the north of the High School and 3 vacant lots.

  The three schools are currently supplied with clean potable water from two wells at the High School and one at the Korn School. The supply well at the Strong School had been contaminated with VOC's and was abandoned in 2004.

- *Durham Heights Area (Area F)*
  This is a subdivision that lies east of Main Street between Oak Terrace and north of the Haddam Quarter Road. Many homes in this area had documented bacteria contamination. CTDEEP (formerly CTDEP) used to provide bottled water for those homes. There are not many homes that still have bacteria issues; only two or three have been identified. Most of the homeowners still complain about aesthetic issues related to their water including hardness, iron and manganese. The Durham Heights Area (Area F) includes approximately 95 properties of which 92 are residential and the remaining 3 are vacant.

- *The Woodland Drive Area (Area G)*
  This is a subdivision that lies east of Main Street and west of the Durham Heights between Oak Terrace and Haddam Quarter Road. This area was included because it would allow for looping of the proposed water mains and provide an independent route for water to be conveyed to the south if there are issues along Main Street. There have not been any instances of contamination, but aesthetic issues related to hardness, iron and manganese in this area have been identified and therefore this area has been included in the consideration the of water main extension service area. The Woodland Drive Area (Area G) includes approximately 55 properties of which 50 are residential and the remaining 5 are vacant.

2.2.3 Middletown Problem Area

- *The Royal Oak Area (Area H)*
  This is a subdivision that lies north of Durham Heights, east of Main Street between Oak Terrace in Durham and Acorn Drive in Middletown. There are mostly aesthetic issues related to hardness, iron and manganese in this area. The Royal Oak Drive Area (Area H) includes an estimated 112 properties of which 109 are residential and the remaining 3 are vacant.

3 Water Extension Scenarios

3.1 Scenarios Developed

A technical review committee (TRC) was formed to review the boundaries of the areas discussed above and determine the scenarios that should be used for detailing system improvements. The TRC was comprised of representatives from the CTDEEP, CTDPH, USEPA, the City of Middletown, the Town of Durham and Fuss & O'Neill.

The initial scenario (Area "A") and various other scenarios for the water service areas were collectively determined by the TRC based on available information evaluated at several meetings, and finalized at a workshop held on February 18, 2009 at CTDEEP's offices in Hartford. The boundaries of each area that will be incorporated into the various scenarios are shown in **Figure 2-1.**

The initial service area would service properties that are within the Superfund Area. Subsequent areas would incorporate some looping of the water mains where practical for water quality and pressure considerations.

3.2 Superfund Site (Area "A")

In the initial Superfund service area, a transmission main from Middletown would logically be extended south on Route 17 from Talcott Ridge Drive and the site where the new Cherry Hill Storage Tank is proposed. The transmission route south along Main Street (Route 17) would form the backbone of the initial scenario investigated. All other scenarios will include this area. The water main proposed for Wallingford Road and Maple Avenue would enhance the grid layout of the water system, which will add to the overall reliability of the system. See **Figure 2-1** for proposed water main extension and location of the proposed Cherry Hill tank.

3.3 Core Area - (Superfund Site + Areas B + C + D)

The majority of the Durham Meadows Superfund site (Area "A"), MTBE site (Area "B"), 1,1 DCE site (Area "C") and Parsons area (Area "D") are formed by the blocks consisting of Main Street, Maple Avenue, Middlefield Road, Talcott Lane, Wallingford Road, Parsons Road, Winsome Road and a private road (Marina Place) near Talcott Lane. These roads have been defined as the Core Area. The water main proposed for Talcott Lane, Maple Avenue and

Middlefield Road, not only provides water to lots with contaminated wells but also would enhance the layout of the water system and add to the overall reliability of the system.

3.4 Core Area + Area E (Schools Area)

In this scenario, water main would be installed on Pickett Lane for all three schools as well as the private residences and chicken farm. The water main would then loop and be on Maiden Lane coming back to Main Street.

3.5 Core Area + Area I (Durham Center Area)

A transmission main from Middletown would be extended south on Route 17 and would be connected to the stub from the existing Durham Center Water System that is capped on the north side of the bridge traversing Allyn Brook. It was agreed by TRC that the existing Fairground Wells will be used to meet Peak Demands during the Fair.

3.6 Core Area + Area F (Durham Heights)

Homes on Oak Terrace, Wilcox Drive, Edwards Road, Austin Road and Partridge Lane would be added to the Core Area in this scenario. The water main should be looped back to Main Street via Haddam Quarter Road, if possible.

3.7 Core Area + Area F + Area G + Area H

Most of the homeowners in the Royal Oak Drive, Woodland Drive and the Durham Heights Areas have concerns about aesthetic issues related to their well supplies including hardness, iron and manganese. These areas were included together because of their proximity to each other, the ability to loop the proposed water mains for better water quality and consistent pressures and in order to provide an independent route for water to be conveyed to the south if there are issues along Main Street.

3.8 Core Area + Areas E + F + G + H + I (All Areas)

This scenario includes all the areas described above and is shown on **Figure 2-1.** Water service to the buildings will be provided to properties with well contamination in Superfund site. For other lots, a water service stub will be provided to the property line. If contamination is present (MTBE and 1, 1 - DCE areas), these may have services provided to the buildings depending on funding obtained. Vacant lots will not have service connections.

4 Discussion of Alternatives

4.1 No Action

The "No Action" alternative would include maintaining the individual treatment systems that are in place and continue with current conditions. This is an unacceptable alternative because the No Action alternative does not provide long-term effective and permanent solution to

address residual risks from contaminated groundwater. In addition, the Town will not be in compliance with the Consent Order issued in 1990 to abate pollution to the groundwater from the existing system. For these reasons, "No Action" is not a viable alternative.

4.2 Development of a New Surface Water Source (Miller Pond)

Miller Pond is located in the eastern edge of Town close to the Haddam / Durham Town line. Miller Pond was acquired in 1955 by the State Park and Forest Commission from the heirs of Thomas Macdonough Russell. At that time, the park consisted of 30 acres of pond and 170 acres of wooded land in the Towns of Durham and Haddam. In succeeding years the state purchased additional property from the George W. Seymour Endowment Fund. The stipulations in accepting the Funding from the George Seymour Trust would preclude the use of Miller's Pond for anything other than recreation. The State Parks Division also wishes to preserve the ability to build out a small park and provide public swimming in this area in the future. If this became a public water supply, that would not be possible.

Miller Pond is unique in that its principal source of water comes from large springs which create a body of unpolluted water excellent for small mouth bass or trout.
The Pond size is 32 acres with an average depth of 15 feet (deepest point is 18 feet). The watershed for the dam is approximately 0.4 square miles. The Pond is part of the Miller Pond State Park that has trails for hiking, camping, and picnicking. The Park also allows some hunting in the fall months.

The Pond is categorized as a Class "A" surface water body and can be used for recreational purposes that include fishing, non-designated swimming, cartop boating and potentially water supply.

If this surface water were to be used for water supply, a feasibility study would be required initially to analyze the water quality of the pond to determine the extent of treatment that would be required. Further, a hydraulic study to determine the pond's potential safe yield and available supply would be necessary to size the major components that would make up the treatment facility (initial calculations have determined the safe yield to be only 0.4 - 0.5 million gallon per day). Finally, a diversion permit would be necessary to transfer flow from the existing watershed to the Town of Durham.

If the pond provided enough water (0.5 MGD) to meet the demands of the Superfund Site (without fire protection), the following components would be necessary:

- Treatment facility including chemical treatment, coagulation, filtration, sedimentation and disinfection,
- Clearwell for storing treated water,
- Booster pumping station to pump water from the Facility to Durham,
- Standpipe for the distribution system to provide storage and fire protection, if necessary,
- Approximately 3.5 miles of water transmission line to get to the Durham System,

- Development of a Water Department with provisions for treatment and distribution operators to manage and maintain treatment facility, pump station, storage tank and water mains.
- Annual operation and maintenance budget including operator's salary, chemical costs, equipment costs, power costs and maintenance budget.

If USEPA costs indices are used for a typical complex water treatment plant and components assuming a 0.5 million gallons per day capacity, an estimated cost would range from $5 to $8 million dollars depending on equipment used and facility configuration. In addition, costs for an intake structure to gather water and bring it to the treatment plant (~$2 million dollars), a booster pump station (~$1,000,000), a storage tank ($1.25 Million), and the transmission main to Durham (~$4.0 million) would be necessary to bring water to Durham. Costs for mains in Durham would also need to be included. This source would not allow other residents along the route to connect to the system

The costs presented do not include the development of a Water Department, salaries, operation and maintenance budgets/costs and ancillary administrative expenses that also would be necessary to efficiently and effectively operate and maintain a water department and system.

Because of the limited quantity available, the significant initial capital costs, the need to put a lot of infrastructure in place and the unknown of water quality and available supply, this option was eliminated from further consideration.

4.3 Use of the Durham Fairgrounds Wells (Water Main Extension)

Development of a new groundwater source and distribution system was investigated in the Record of Decision as a contingency measure in the event that the connection to the Middletown Water Distribution System could not be implemented for administrative or other reasons. At the time the Record of Decision was issued, the Town of Durham, in conjunction with the Connecticut Department of Health, was in the process of obtaining the Durham Center Water System and the exclusive service area rights for the Town of Durham.

The Durham Center Water System is now being served by the two Fairgrounds Wells. Durham Fairground Well No. 1 and No. 2 were taken over from the Durham Agricultural Fair Association to provide water to the Durham Center Water System. The Fairground Wells are less than 1,000 feet south of Allyn Brook, and the straight-line distance from these wells to the boundary of Superfund Site Technical Impracticability Zone as described in USEPA's Record of Decision is approximately 1,200 feet. The Technical Impracticability Zone generally defines the limits of the proposed water service area for the Durham Meadows Superfund Site. The groundwater plume from the Superfund site generally travels from the northeast to the southwest, which is generally towards the Fairground Wells. Also, a bedrock fault, called the Ball Brook fault, cuts directly through the site near the Durham Manufacturing Facility in the same general direction of groundwater migration in bedrock.

If the Fairgrounds Wells were to be connected to the Superfund Site and the individual and or residential wells were no longer pumped for the properties within the Superfund Site, the Fairground wells would be drawing water directly downgradient of the Superfund site, while at the same time providing an influx of fresh water into the contaminated aquifer within the

Superfund site. This scenario along with the geological details pointing toward a southwesterly flow would result in an increased risk that the contaminated groundwater would migrate from the Superfund site to the Fairground Wells thus further contaminating that aquifer and this source of supply. Contamination of the Fairground Wells would require treatment to remove the contamination prior to distribution. This would significantly increase the current operating cost for this system.

Note also that extending the Durham Center Water System to service the southern portion of the Superfund site would still require an extension from the Middletown System to service the northern portion of the Superfund site since there is not enough capacity in the Durham Center System to serve the entire Superfund area. This is because the fairground wells presently are limited to a maximum combined withdrawal of 50,000 gallons per day. A Diversion Permit would be required to increase the production from these wells to service the entire area and this effort would be significant. Given the increased risk of contamination of the Fairgrounds wells and the continued need for the Middletown interconnection even if the Durham Center Water System was used due to capacity limitations, this alternative was deemed too costly and unfeasible.

4.4 Investigation of a Groundwater Source

Another potential groundwater source that was discussed is located in the southeastern corner of the Durham Center Water System along Higganum Road. This area was perceived to be a potential water producing area based on the production of some individual residential wells in the area. One developer drilled a test well in January of 2009 to investigate this option. According to Bill Milardo, Town Sanitarian, the test well did not produce very much water and the developer did not feel a production well would be able to produce enough water for the demands projected for the base case of our Study (the Superfund Site Area).

A second parcel, the DeFelice property, is a 37.5 acre parcel located south of the Durham Center. On July 12, 2012, Frank and Debra Defelice wrote a letter to the Commissioner of Department of Energy and Environmental Protection (DEEP) raising their concerns on whether the State and Federal entities have properly evaluated all available options for providing potable water to the Town of Durham. In the letter, Mr. Frank Defelice and Mrs. Debra Defelice expressed an interest in using their property as an alternative water resource to serve the homes with wells polluted by the Durham Meadows Superfund site. With no scientific study or engineering report conducted at the property, the DeFelice Family did not demonstrate that their property could meet long term water quality, quantity, and compliance with health requirements for providing a long term, safe, professionally managed water supply to the Town of Durham. The DEEP, the Department of Public Health and the Town of Durham believe that all reasonable alternatives were considered and that piping water from Middletown is the best and most viable solution to supply drinking water to the area. The DeFelice letter and the DEEP's response are included in **Appendix C**. The DEEP has not received any other written or verbal comments regarding the "DeFelice Property".

4.5 Connect to South Central Connecticut Regional Water Authority

The South Central Connecticut Regional Water Authority (SCCRWA) has capacity available in their system and the Authority indicated they would be prepared to assist the Town in addressing health and safety needs. See **Appendix D** for SCCRWA's submittal on options and preliminary cost estimates for providing potable water service to portions of the Town of Durham.

This alternative would include connection to SCCRWA's existing distribution system at an existing 16-inch water main located at the intersection of State Route 22 and State Route 17 in Northford. The transmission main would continue north along Route 17 (Middletown Avenue) through North Branford and Durham and stop at the intersection of State Route 17 and State Route 79. As indicated in SCCRWA's submittal, to serve the Superfund site, a combination of 16-inch and 20-inch main is required.

Supplying Durham would require the construction of approximately 8 miles of transmission main. SCCRWA's existing Clintonville Pumping Station would be the source of supply for the proposed Durham service areas as described in their proposal. The future demand from SCCRWA's customers and Durham's needs total approximately 2.7 mgd. The Clintonville pumping station has two existing pumps; each capable of 2.2 mgd. SCCRWA does not anticipate any upgrades to the pumping station. (We recommend an additional pump be added to the station, to be able to supply 2.7 mgd to the customers in case one of the pumps is out of service).

This Clintonville Pumping Station would pump water toward a new booster pumping station along Route 17. This new pump station would be necessary in order to pump water over a large hill located on the North Branford/ Durham town line with an elevation of 338 feet. The fire pump is required in the new pump station to supply fire flow. SCCRWA recommended a storage tank be located on the discharge side of the pumping station to reduce the main size and provide redundancy and reliability.

SCCRWA's proposal identified five alternatives for service to Durham. A cost estimate for each of the five alternatives was presented in Table -1 at the end of SCCRWA's proposal (**See Appendix D**). The cost estimates include contingencies for engineering (15%) and construction (25%). Overall costs ranged from $13,712,050 to $21,735,010. The cost estimates did not include improvements to the existing Clintonville Pumping Station as well as costs expected for permitting, a culvert crossing, rock drilling and blasting.

Because of the capital cost, the hydraulic concerns over the long transmission main, the necessary improvements to the Clintonville Booster Station and the need for extending main through the existing Durham Center System in order to provide sufficient water at reliable pressures, this option was eliminated from further consideration.

4.6 Connect to Middletown Water System

The City of Middletown currently has excess capacity available in their municipal system for current demands as well as for demands during the planning periods of 2016, 2030 and 2060 as described in Feasibility Study Final Update dated November 2012). The City has indicated they are prepared to assist the Town in addressing public health and safety needs for the community. This alternative was the alternative of choice of the USEPA in the Record of Decision for the Durham Meadows Superfund Site, issued September 2005, and was recommended by Fuss & O'Neill in the original study completed in 2000. This was confirmed again in the Final Update to the Feasibility Study that was completed in November of 2012. This alternative is described in detail below.

5 Recommended Scenario - Extension of Water

As a result of the groundwater contamination problems, the recommended water distribution system that should be implemented will include, at a minimum, the base case or the Superfund Site Area. In addition, the remaining three areas in the Core Service Area Scenario as described above will be serviced. This is shown on **Figure ES-5.** The Town of Durham has also recognized the need for improved fire protection, therefore, fire protection is recommended as part of the initial water distribution system. This results in a system that will be able to provide approximately 800,000 gallons per day to maximum demands in the system as well as provide fire protection.

If the Town cannot obtain enough funding to implement the recommended water distribution system with fire protection to all Core Areas Scenario in the study, then the project could be constructed in phases as funding and monies become available.

Phase 1 would extend the water system from Middletown down Route 17 to the Durham Area to supply potable water to the properties in the Superfund site as recommended. Service connections would only be provided for the existing structures of 100 properties in the Superfund Site Area. The water mains would be sized for fire protection, and the proposed Cherry Hill Water Storage Tank would be provided.

After more money and supply became available, the remaining Areas (B, C & D) could be serviced and a determination on how service connections would be installed would be determined.

Service connections all the way to the buildings will be provided for the properties within the Superfund Site and buffer zone. Services would only be brought to the property line for the other lots within the remaining areas. Service connections would not be provided for vacant lots.

If USEPA becomes the sole source of funding for this project, USEPA's authority is limited only to providing potable water to the Superfund Site area (base case). No funding could be provided for fire protection or to address any other contaminated areas outside of the Superfund Site.

6 Existing Conditions and Analysis of Impact

This section describes the existing environmental conditions in the project study area shown in **Figure ES-3** and provides an analysis of the direct, indirect and cumulative impacts associated with the proposed action. Existing conditions in the project area would be the same for all alternative water supply sources considered. The analysis of impacts focuses on the identified preferred alternative since other alternatives considered where unable to adequately meet the project purpose and need. Where appropriate, a discussion of probable mitigation measures is also included.

6.1 Wetlands and Inland Water Resources

Figures 6-1, Figure 6-2 and Figure 6-3 show surface waters and their quality, groundwater quality and wetlands within the proposed project area. The proposed water main extension project will not directly impact wetlands but may cross surface water bodies if Area E and G were to be included in extension of water system.

Based on the preliminary layout of the project, the water main is proposed to be installed in the existing road right-of-way but off the payment on State Route 17. It is not anticipated that any construction will occur within the wetlands, although with any significant construction project, there exists a potential for erosion and or sediment to be washed into surface watercourses. Best management practices will be used to minimize or eliminate impacts to the wetlands adjacent to the proposed water main and water storage tank.

Appropriate erosion and sediment control measures, such as haybales and silt fencing will be used wherever necessary to prevent the dispersion of sediments into wetlands and water courses. Water pumped during trench dewatering operations (if necessary) will be discharged into sediment traps or dewatering bags. Disturbed, vegetated areas will be loamed, seeded, and mulched as soon as possible after the installation of water main so the vegetative cover will be re-established quickly to prevent erosion. The use of silt sacks in catch basins or storm drainage is also recommended to reduce the amount of sediment. No construction equipment or materials will be operated, located, or stored in wetlands areas. All exposed soils will be restored to their former condition, either with appropriate foliage or with erosion-resistant stone cover.

A stream crossing would be required if the main were extended to the Schools Area (Area E), the Woodland Drive Area (Area G) and the Durham Center Area south of Allyn Brook (Area I). It is anticipated that a Local Inland Wetlands Permit would be necessary. A permit from the United States Army Corp of Engineers may not be required for a stream crossing because the water main will most likely be strapped to the culvert within the existing roadway and have minimal impact to the stream or surrounding wetlands. The need will be determined as design progresses. Specific mitigation measures would be identified through the permitting process.

6.2 Aquifer Protection Zones

The Town of Durham and the City of Middletown's Aquifer Protection mapping within the study area was reviewed to determine the location of aquifer protection zones. As shown in the

Aquifer Protection Map (See **Figure 6-4**), there is no aquifer protection areas located within the study area for active supplies.

6.3 Floodplains

According to information obtained from the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program Maps (Figure 6-5), the proposed water main extension for looping within the Superfund Site Area will be close to the area designated as the 100-year floodplain. If the water main is extended to Schools Area, a potential crossing of the 100-year floodplain will occur.

Construction of the proposed project will not increase flood hazards or flood elevations, nor will it adversely impact flood storage capability.

6.4 Historical/Archeological and National Landmarks (SHPO Review)

The Connecticut State Historic Preservation Office (SHPO) was contacted to review the study area. The State Historic Preservation Office has indicated that the study area is recognized as a moderately to highly sensitive area with respect to prehistoric and historic archaeological resources (See **Appendix E** for SHPO correspondence). Although this is a sensitive area, minimal concerns are anticipated since the project work will take place primarily in the roadways and already disturbed areas. It was recommended by SHPO that a professional assessment survey be undertaken to identify and evaluate archeological or historical artifacts in the project area. No ground disturbance or construction activity would be initiated until the SHPO review and comment upon the archaeological survey report was completed.

6.5 Endangered, Threaten and Special Concern Species

The CTDEEP Natural Resource Center's Natural Diversity Database (NDDB) was reviewed to identify known extant populations of Federal or State Endangered, Threatened, or Special Concern species. Mapping showed an area in the northern portion of the study area and west of Main Street and Middlefield Road as an area for potential concern or for further investigation regarding these endangered species (See **Figure 6- 6**).

The CTDEEP State Wildlife Division was contacted to review the Natural Diversity Database map of the study area. Based on the NDDB review, it was indicated that the proposed project is unlikely to impact state-listed species which occur within the study area. It was suggested that the proper sedimentation and erosion controls should be used near wetlands/watercourses and adjacent storm drains. A more detailed review may be required as part of subsequent environmental permit applications. (See **Appendix-F** for NDDB correspondence).

If the proposed area of construction is altered during project design, CTDEEP program staff will be consulted for additional measures that may be necessary to provide the required protection for the species.

6.6 Coastal Area Management

The project area is not within the coastal management boundary as depicted in **Figure 6-7**.

6.7 Wild and Scenic Rivers

There are no wild and scenic rivers in the project area.

6.8 Prime Farmland

The majority of the proposed study area is defined as prime farmland soils (See **Figure 6-8**). However, most of these areas are developed residentially and are no longer available as farmland. No impacts to farmland soils are expected since the water main is proposed to be constructed within existing roadways.

6.9 Public Utility Services Impacts

The main impact on public utility services would be on public water supply for the Durham Center Area. The extension would provide a long-term effective and permanent solution to address residual risks from contaminated groundwater.

The extension of water from Middletown would not have any negative impacts on Middletown in the short term and in the long term planning periods. The City would have sufficient supply available as documented in the Feasibility Study Final Update Report dated November 2012 included in **Appendix A**.

6.10 Consistency with Approved Land Use Plans

6.10.1 Local Zoning

Zoning designations for Durham and Middletown are depicted in **Figure 6- 9**. An updated zoning map dated November 2008 was provided by Midstate Regional Planning Agency.

The study area consists of mostly farm residential properties that have varying lot sizes, with the exception of the areas of Main Street, which are primarily residential and commercial properties with small lot sizes. On the northeast portion of Main Street there is some light industrial zoning. Along Main Street there are six undeveloped lots. Merriam Manufacturing Company and Durham Manufacturing Company, and possibly other industries in the area, are grandfathered into what is a residentially zoned neighborhood. (The zoning map in **Figure 6-9** clearly shows the two companies embedded in a residential zoning district.)

Protection of watershed area is included in Middletown's zoning code. Section 42 (in **Appendix G)** is a Water Supply Source Protection Ordinance that includes watershed lands. Any proposed development within an aquifer protection overlay zone or watershed must comply with their regulations. The uses of any new development are limited and require a site

plan review process which includes review by the Middletown Health Department and Water & Sewer Department for sites which require public water.

The proposed project is consistent with local zoning.

6.10.2 Regional and Local Plans of Development

The project is also consistent with the Durham Plan of Conservation and Development adopted in 2000. The Midstate Regional Planning Agency has indicated that this project is consistent with the goals and objectives of the Regional Development Guide for the Midstate Region.

6.10.3 Statewide Plan of Conservation and Development (C&D Plan)

The Statewide Plan of Conservation and Development also designates categories of land use characteristics for the entire state and presents goals and policies for these categories. The categories of land use are designated on the Locational Guide Map (See **Figure 6-10**) as follows:

Development Areas

- Regional Centers
- Neighborhood Conservation Areas
- Growth Areas
- Rural Community Centers

Conservation Areas

- Existing Preserved Open Space
- Preservation Areas
- Conversation Areas
- Rural Lands
- Level A/B Aquifer Protection Areas
- Historic Areas

In general, a water main extension project must be consistent with the C&D Plan's Locational Guide Map in order to be approved by the CT Department of Energy and Environmental Protection (CTDEEP) and to be eligible for most state funding programs.

The Conservation and Development Plan for Connecticut contains multiple classifications in the project area (**Figure 6-10**):

Growth Areas
Growth Areas provide the opportunity for staged urban expansion generally in conformance with municipal or regional development plans. These lands reflect moderately developed areas with vacant, developable lands, existing or planned water or sewer services, and the potential for future mixed use and intensive development of area wide significance.

Rural Community Centers
Rural Community Centers reflect existing mixed use areas or places that may be suitable for future clustering of the more intensive housing, shopping, employment, and public service needs of municipalities outside of urban development areas. Rural Community Centers are areas where small-scale community systems of water supply, waste disposal, and public services are appropriate but large-scale public service systems should be avoided.

Conservation Area
Conservation Areas advocate the long-term public benefit, the lands contributing to the state's need for food, fiber, water and other resources, open space, recreation, and environmental quality and ensure that changes in the use are compatible with the identified conservation values.

Preservation Area
Preservation Areas advocate the protection of significant resource, heritage, and recreation of statewide significance. For these areas, the priority is to avoid support of structural development except as directly consistent with the preservation values.

Rural Lands
Rural Lands are those areas falling outside any other Guide Map Category. Structural development forms and intensities which exceed on-site carrying capacity for water supply and sewage disposal are discouraged.

Historic Districts
Historic Areas include Local Historic Districts, as defined in state statute, as well as National Register Historic Districts. Development in these areas must be in accordance with any guidelines or standards established for the district.

Most all of the areas within the water main extension area are consistent with the State's C&D Plan. The majority of the area along Main Street is classified as "Historic District" and "rural community centers", where water main extensions are appropriate. The areas where there is a discrepancy include:

- Area northeast of Main Street (Route 17), Haddam Quarter Road and Middlefield Road are within a designated "Conservation Area". This area is predominantly developed. Any water main extension in this area would be to serve homes with groundwater quality issues. It would not result in additional development in this area.

- South Main Street in Middletown is also a conservation area. It extends on both sides of Route 17 in the southwest corner of Middletown and in a sliver in the northern tip of Durham. This area coincides with residential and agricultural zoning in Middletown which would limit any development or growth in this area.

- There is area designated a "Growth Area" on the State's C & D Plan (**Figure 6-10**). Zoning maps shows this area to be within the limited industrial (I-4) zoning on the west side of Route 17. The I-4 area is a special zoning designation that restricts the types of businesses allowed. (See **Appendix G** for Section 61 of the zoning code, it

also can be found at www.middletownplanning.com). This same area also has an overlay district which is designed to protect the current or potential water supplies in the area including Laurel Brook Reservoir (See **Appendix G** for Section 42 Protection of Water Sources). The zoning/overlay district prohibits certain types of uses and limits the area that can be developed on a parcel. This was developed in cooperation with the former CTDEP in order to protect the current and potential sources of supply in this area, limit the environmental impacts from manufacturing activities and restrict certain types of development. Because of these limitations, this discrepancy should not attract significant development.

- The preservation areas in Middletown are surrounding the potential source of supply at the Laurel Brook Reservoir and adjacent to the Conservation area along the west side of Route 17. These areas will not be disturbed by the extension of water to Durham.

- Durham zoning is almost entirely farming residential with small pockets of commercial, light industrial and Main Street Residential that supports small commercial development. When comparing this with the State's C&D plan there does not appear to be issues with extending water in and through these areas.

- A portion of Main Street south of the Middlefield border including Oak Terrace and a portion of Partridge Lane are located within designated "Rural Land Areas". This designation limits the amount of development to what can be handled by on-site sewage disposal systems. Given the parcels in the area, there does not appear to be any significant development possible.

- The proposed Booster Station for the Royal Oak Area ("Area H") is proposed for a property designated "Conservation Area". The booster station is necessary to deliver water to the Durham areas being served by the water main extension. The station will be sized to serve the areas included.

All proposed work in these areas will occur in the roadways. Most of the proposed work in Durham is within areas identified as rural community centers. This area would support a water system. The proposed water mains are to eliminate usage of contaminated groundwater and wells and potentially provide fire protection for existing residential and commercial development, not to facilitate growth in these areas. No growth in areas designated as conservation or preservation areas are anticipated as a result of the proposed water extension given the existing zoning and overlay district limitations in place. Based on the discussion and considerations described above, the proposed project is consistent with the goals of the Conservation and Development Plan for Connecticut.

6.11 Energy Considerations

Energy expenditures for the project fall into two categories: construction and operation. In terms of construction, energy consumption will be primarily that needed to power construction vehicles and produce construction materials. This expenditure will not be significant. In terms of operation, the energy expenditures will be those needed to power pumps at the Long Hill pumping station versus those needed for the individual systems and wells already in place at the

homes where contamination was detected. An increase in energy consumption may occur at the pump station with the installation of an additional, larger capacity pump for the proposed service area. A pump with a high efficiency motor and a variable frequency drive (VFD) is recommended for the pump station upgrade to offset increased energy usage. This will be offset by the decrease in energy that would occur by the elimination of the individual well pumps and treatment systems at each of the homes.

6.12 Construction-Related Impacts

Construction-related impacts are those associated with the construction phase of the proposed project, which is anticipated to be approximately 12 to 18 months depending on the final extension configuration and the size of the infrastructure provided.

6.12.1 Air Quality

Any air quality impacts resulting from the project will be minimal and generally short term in nature. It is expected that short-term effects on the air quality in the immediate vicinity of a water extension would occur from dust and exhaust emissions from construction equipment. The dust resulting from construction activities will occur along Main Street, Parsons Rd., Winsome Rd., Haddam Quarter, Marina Pl., Middlefield Rd., Wallingford Rd, and Maple Avenue. The contractor will be required to mitigate levels of excessive dust to minimize air quality issues and this temporary impact. A certain amount of dust will be generated by the water main installation. Dust control through the use of water and/or calcium chloride will be utilized wherever necessary. Dust generation impacts will be minimized to the extent practicable.

6.12.2 Noise

A temporary increase in noise may occur during the construction of the water mains in the roadways of the proposed extension. Restricting construction activities to normal work hours will minimize any impacts. The Town of Durham, if desired, can limit the construction to certain hours each day in the project specifications.

6.12.3 Traffic

Water main construction will result in temporary disruption of traffic on state and local roads in the study area. Maintenance of reasonable access to the homes along the water main route for local residents and emergency vehicles will be maintained. State police officers for state roads, uniformed officers for town road and signage would be used for maintenance and protection of traffic during construction activities. The Connecticut Department of Transportation (CTDOT) restricts work hours on state roadways to off-peak traffic times.

6.12.4 Public Utility Services Impacts

Temporary disruption of utilities is possible during the construction phase, although most conflicts can be avoided through careful design and appropriate confirmation. Electricity, cable and telephone services are provided by overhead utilities. Natural gas and sanitary sewers are not available in the project area. No impacts to the existing public water supply provided by the

Durham Center Water System are anticipated since these mains area located south of the area of proposed construction. Storm drain systems in the project area are old and locations area uncertain is some areas of the proposed water main extension route. Confirmatory test pits can be dug prior to trench excavation where existing storm drain depth and/or locations are unknown.

6.12.5 Water Quality Classifications

Groundwater in the Durham Meadow area and along a portion of Middlefield Road are classified as GA or GAA but they may be impaired due to the public health concerns resulting from the contaminated groundwater releases emanating from the Superfund site and other sites in Town. South Main Street in Middletown is classified as GAA, Main Street (State Route 17) in Durham is classified as GAA and the rest of the study areas are classified as GA.

Water extension from Middletown's existing water system will improve drinking water quality for the Superfund Site Area and potentially in the other contaminated areas within the Core Service Scenario recommended.

6.13 Indirect Impacts

Indirect impacts are secondary impacts that may result from both short-term and long-term activities induced or stimulated by the proposed action.

There is a possible concern of long term adverse impact on water quality given the contamination from the Superfund site may migrate beyond the Superfund Site and the Technical Impracticability Zone after alternative water supply is connected to affected areas. Elimination of pumping in the Superfund Area may allow contamination to migrate since there is no longer any extraction of groundwater that is holding the contaminants in place. After the construction of water supply system to the Superfund Site area, USEPA will implement a monitoring network in order to monitor plume migration and ensure the plume does not migrate beyond the limits of Technical Impracticability zone as defined in USEPA's Record of Decision.

Induced growth is not anticipated as a result of the proposed water main extension. There are total of 30 vacant lots in the study area and only 10 of those are located within the Core Area recommended for service. Development of these lots, if they occur, would be consistent with the underlying zoning.

The proposed project is anticipated to have an indirect positive benefit to property values in the project area. Homes which have historically had contaminated underground well water will benefit by the proposed project. Provision of public water supply, coupled with the potential for fire protection, should result in a long-term increase in property values for the affected homes.

6.14 Cumulative Effects

Cumulative effects are defined in CEPA as the impacts on the environment which result from the incremental impact of the action when added to other past, present or reasonably foreseeable future actions to be undertaken by the sponsoring agency.

The project may have secondary impacts to groundwater quality (See Section 6.13 above) but no cumulative effects are anticipated as a result of prior, current, or reasonably foreseeable agency actions."

6.15 Irreversible and Irretrievable Commitment of Resources

Resources being committed to the implementation of the project include all fuel, labor and materials necessary to construct the water mains, water storage tanks and upgrades to infrastructure in Middletown's Water System. This project also requires a long-term commitment on the part of the Town and or City of Middletown to provide labor and management resources to properly operate and maintain the water system.

6.16 Unavoidable Adverse Impacts

Unavoidable adverse impacts are limited to short term impacts directly related to construction operations. Dust and noise will be present during construction operations. Temporary traffic restrictions or detours may be necessary to accommodate construction in local streets.

Erosion and sedimentation may occur in or adjacent to areas where the water mains are installed adjacent to wetlands or surface waters. Excavation may be necessary in or adjacent to designated wetlands, if no feasible routing alternatives exist. All these adverse impacts can be minimized or mitigated, and will be subject to state and local permit approval.

6.17 Socio-Economic Impacts/Cost-Benefit

A summary of costs for each scenario with and without fire protection are presented in the Update to the Water Main Extension Study attached in **Appendix A**. The overall opinion of capital cost for the recommended scenario (the Core Service Area that includes the Superfund Site and Areas B, C and D) includes the cost of water main, new and upgraded infrastructure and the provision of fire protection is estimated at $16,860,000. This opinion is budgetary and has a range of +30% to -15% of the cost presented. This results in an estimated cost ranging from $14,331,000 to $21,918,000.

Benefits associated with the proposed project include the short term increase in construction activity and the use of various trades that are necessary to complete the extension. The resulting extension will also provide safe reliable drinking water, increase in property values in the areas currently impacted by groundwater contamination, and eliminate the costs associated with individual treatment systems and water quality sampling at existing wells.

If this project is funded by the CTDEEP's Clean Water Fund (CWF), it is expected to be eligible for a grant of at least 20%, with a loan at a reduced interest rate for the balance of the cost. Note that these numbers may vary slightly due to actual bids and billings, revised eligibility determinations, and availability of funding.

7 Required Licenses, Permits, Certifications & Approvals

Applications and possible permits will be required for activities conducted in wetlands and at stream crossings. Permits may be required from the following agencies:

- Connecticut Department of Energy and Environmental Protection,
- Connecticut Department of Public Health;
  - Sale of Excess Water Permit
  - Water main application
  - Cherry Hill Storage Tank
  - Booster Pump Station if All Areas are served
- Town of Durham Inland Wetlands Commission,
- City of Middletown Inland Wetlands Commission, and
- Connecticut Department of Transportation Permit - Construction along State Highways (RT 17 & 147),
- SHPO for disturbance of areas of potential sensitivity.

The proposed activity is not expected to cross any water bodies or disturb any wetlands; therefore an Army Corps of Engineers permit should not be required. Any newly constructed infrastructure such as Cherry Hill Storage Tank may need approval from the Middletown Planning and Zoning Commission. A general permit for the discharge of dewatering and stormwater discharges during construction will be filed with the CTDEEP for the construction activities of the water main and the water storage tank.

8 Summary of Agency and Public Consultations

One public informational meeting was held at the Town of Durham's Public Library. The meeting was held on November 12, 2008 after a Notice of Scoping was published in the Environmental Monitor. A second meeting was held at the Public Library on March 23, 2011 to present the results of the Updated Feasibility Study Report and the Environmental Impact Evaluation completed.

CTDEEP arranged both meetings to inform the public and solicit public comments with regard to the scope of work of the Environmental Impact Evaluation and water main extension feasibility study update. Highlights of both meetings are summarized and attached in **Appendix H.**

9 Reference

Reports/Letters

Durham Water System Extension Feasibility Study Upgrade, prepared by Fuss & O'Neill dated February 2009.

A review of pertinent sections of the Durham Meadows Superfund Site Record of Decision (ROD), by Fuss & O'Neill dated November 3, 2008.

Letter from Anni Loughlin (USEPA) to Laura Francis (First Selectwoman) dated November 19, 2008.

Memo from Patricia Bisacky (CTDPH), dated November 21, 2008 to Martin Beskind (CTDEP). DPH comments on Scoping notice for the Engineering Study for the extension of public water system from Middletown to Durham.

E-mail from Deb Hoyt, a Durham resident to Martin Beskind (CTDEEP), November 14, 2008.

10 Distribution List

REVIEW AGENCIES: FEDERAL

1. United States Environmental Protection Agency - 5 Post Office Square, Suite 100, Mailcode: OSRR07-1, Boston, MA 02109-3912

REVIEW AGENCIES: STATE

1. Connecticut Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT 01606
2. Connecticut Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT 01606
3. Office of Policy and Management, 450 Capital Avenue, MS#52ASP, Hartford, CT 06106
4. Council on Environmental Quality, 79 Elm Street, 6th Floor, Hartford, CT 06106
5. Bureau of Natural Resources, Wildlife Division, 79 Elm Street, 6th Floor, Hartford, CT 06106
6. State Historic Preservation Office - One Constitution Plaza, 2nd Floor Hartford, Connecticut 06103
7. Connecticut Department. of Economic and Community Development - 505 Hudson Street Hartford, CT 06106-7106
8. Connecticut Department of Public Health, Water Supply, 450 Capital Avenue, Hartford, CT 06106
9. Connecticut Department of Transportation, Berlin Turnpike, Newington, CT 06111

REVIEW AGENCIES: MUNICIPAL

Durham Town Hall, Durham, CT

1. Town Clerk
2. First Selectman
3. Health Department
4. Inland Wetlands Commission
5. Planning & Zoning Commission
6. Economic Development Commission
7. Town Library

Middletown Town Hall, Middletown, CT

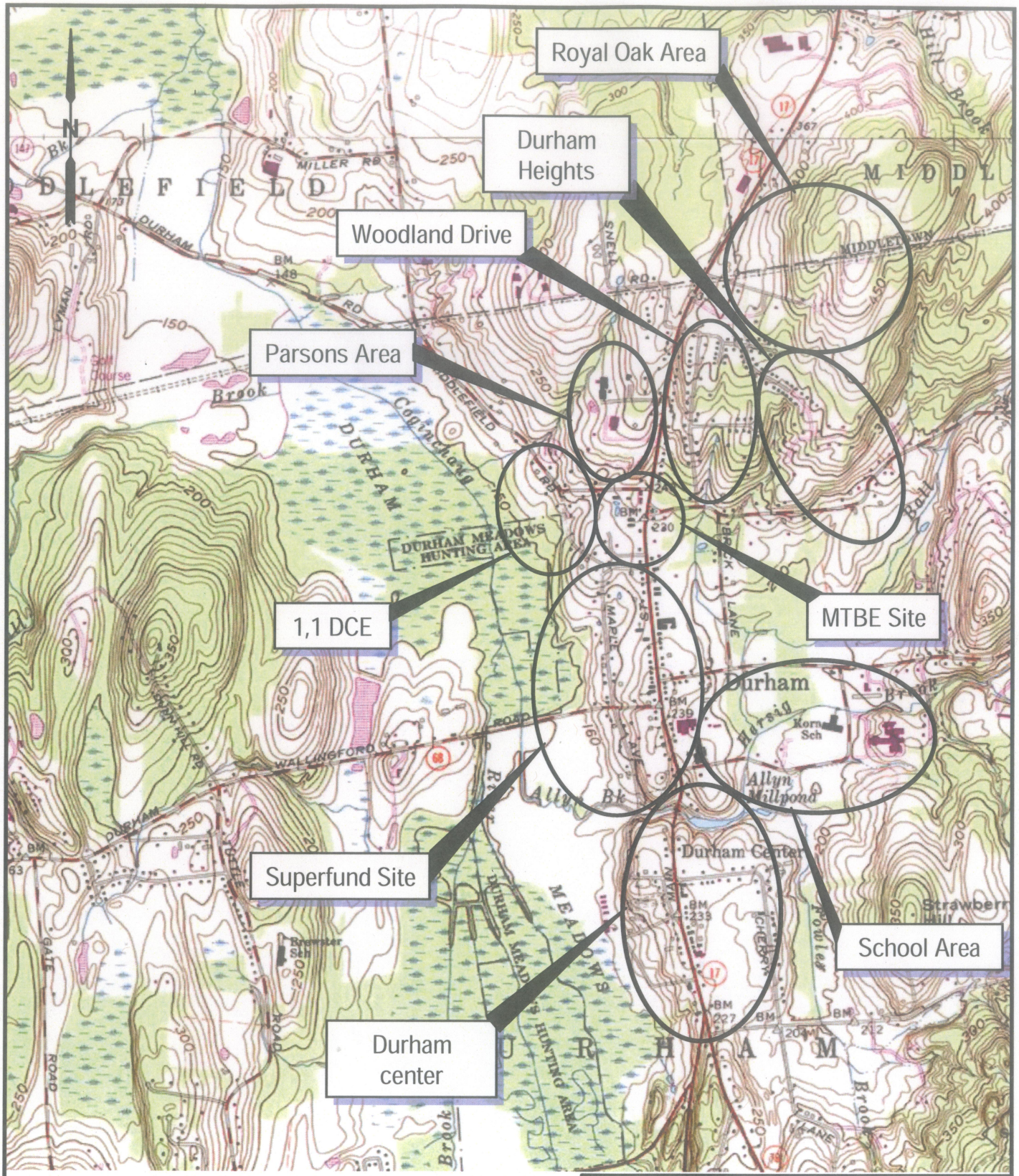
1. Town Clerk
2. Inland Wetlands Commission
3. Planning & Zoning Commission

REGIONAL PLANNING AGENCIES

1. Midstate Regional Planning Agency, P.O. Box 139, Middletown, CT 06457

Figures

Figures



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DURHAM, CONN. 1964 PHOTOREVISED 1984

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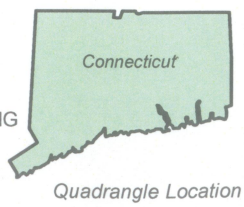
FIGURE ES-1



Quadrangle Location

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TOWN OF DURHAM

AREAS OF CONCERN

WATER SYSTEM EXTENSION FEASIBILITY STUDY UPDATE

DURHAM CONNECTICUT

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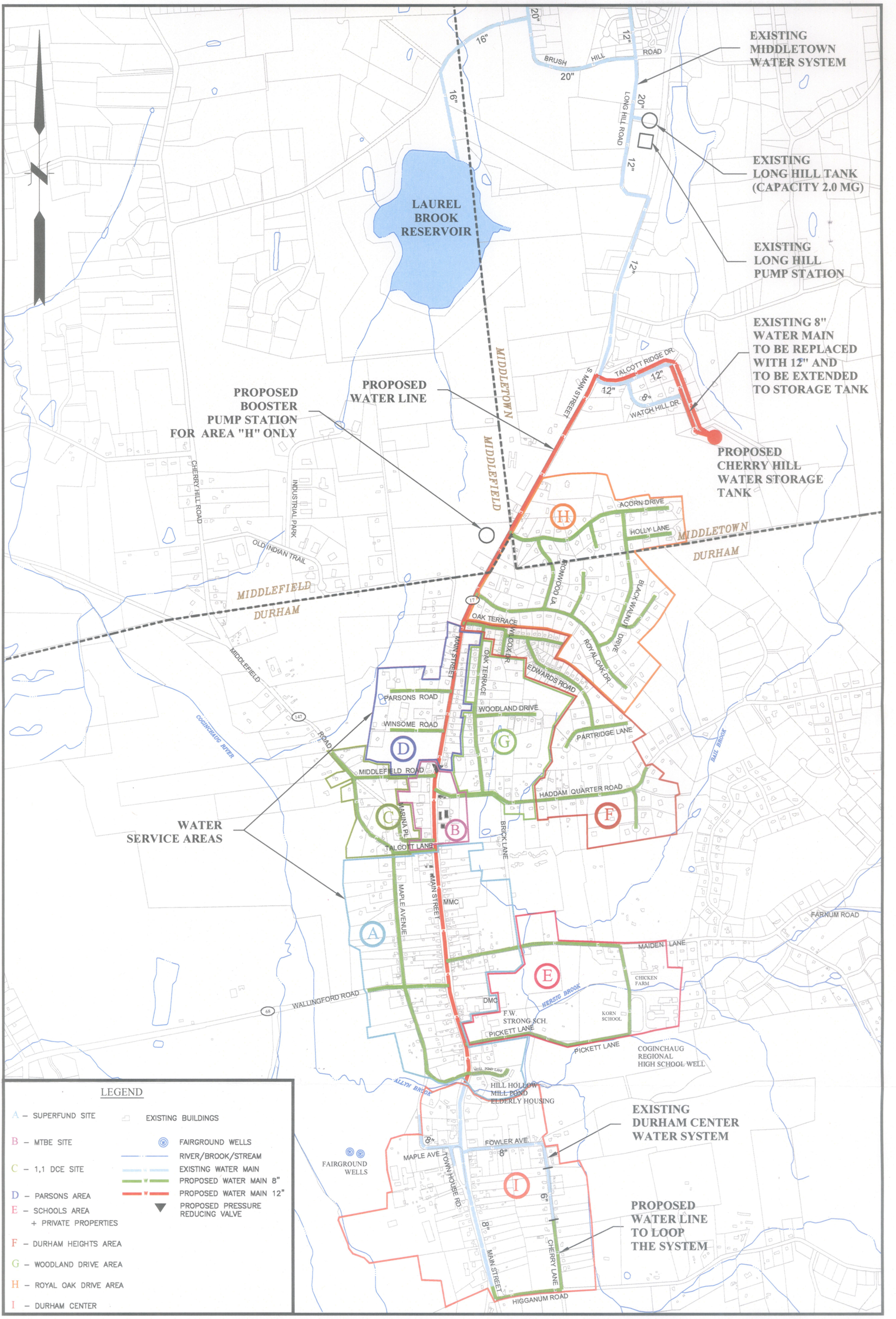

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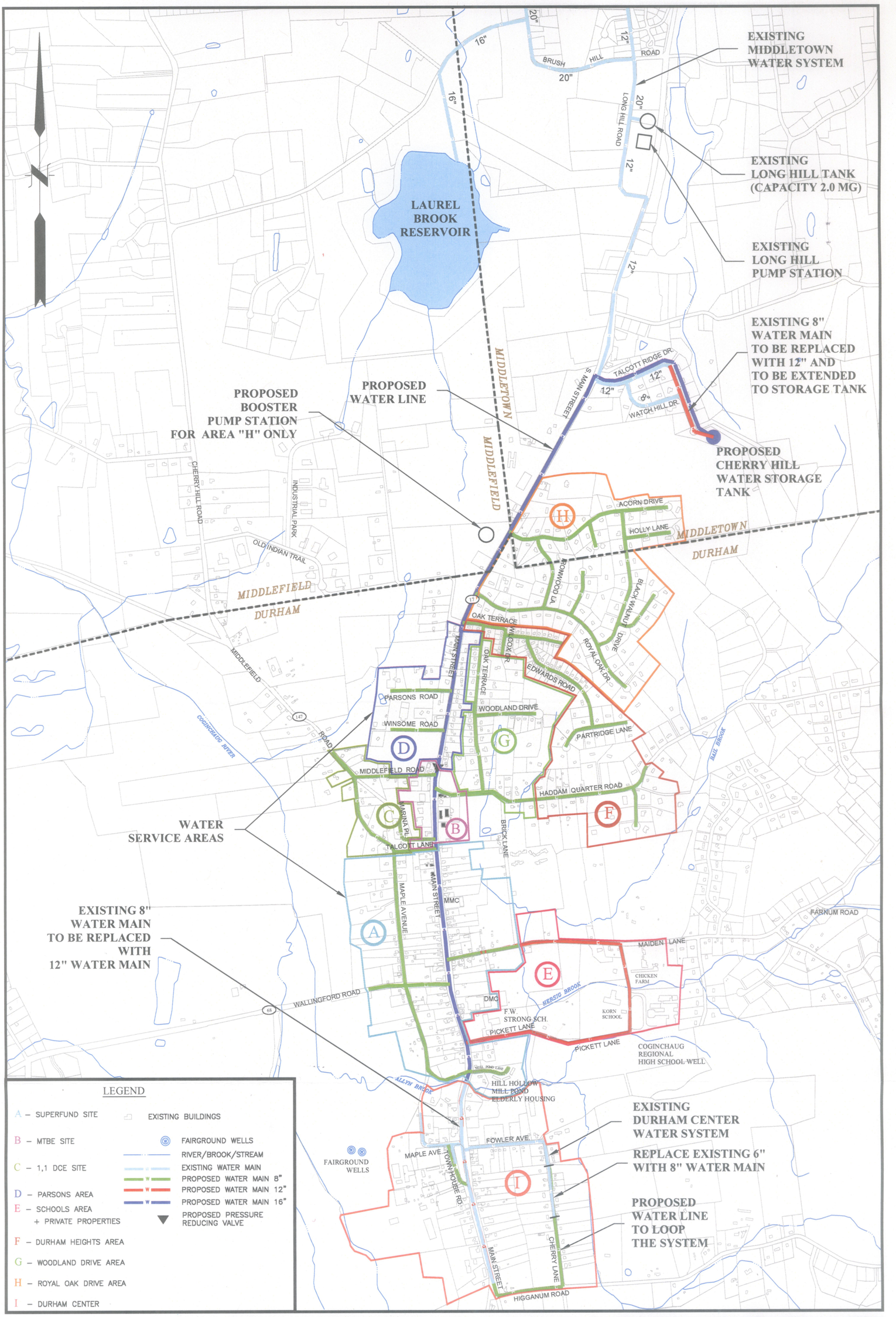

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DATE: AUGUST 2009

FIG.ES-3

STUDY AREAS
ENVIRONMENTAL IMPACT EVALUATION
PIPE SIZING WITH FIRE PROTECTION

DURHAM CONNECTICUT

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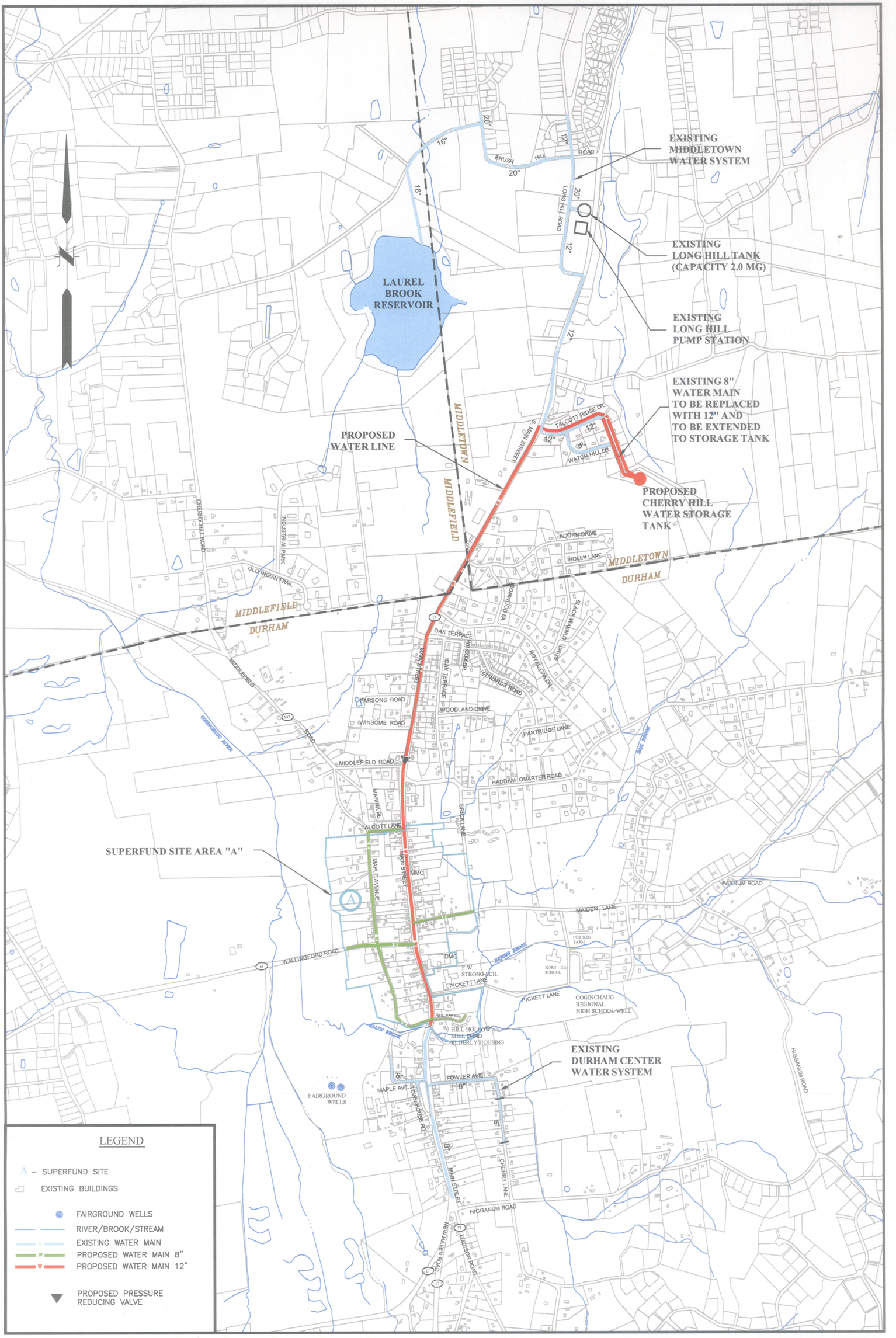

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FIG.ES-4	

SUPERFUND SITE
ENVIRONMENTAL IMPACT EVALUATION
PIPE SIZING WITHOUT FIRE PROTECTION
CONNECTICUT DURHAM

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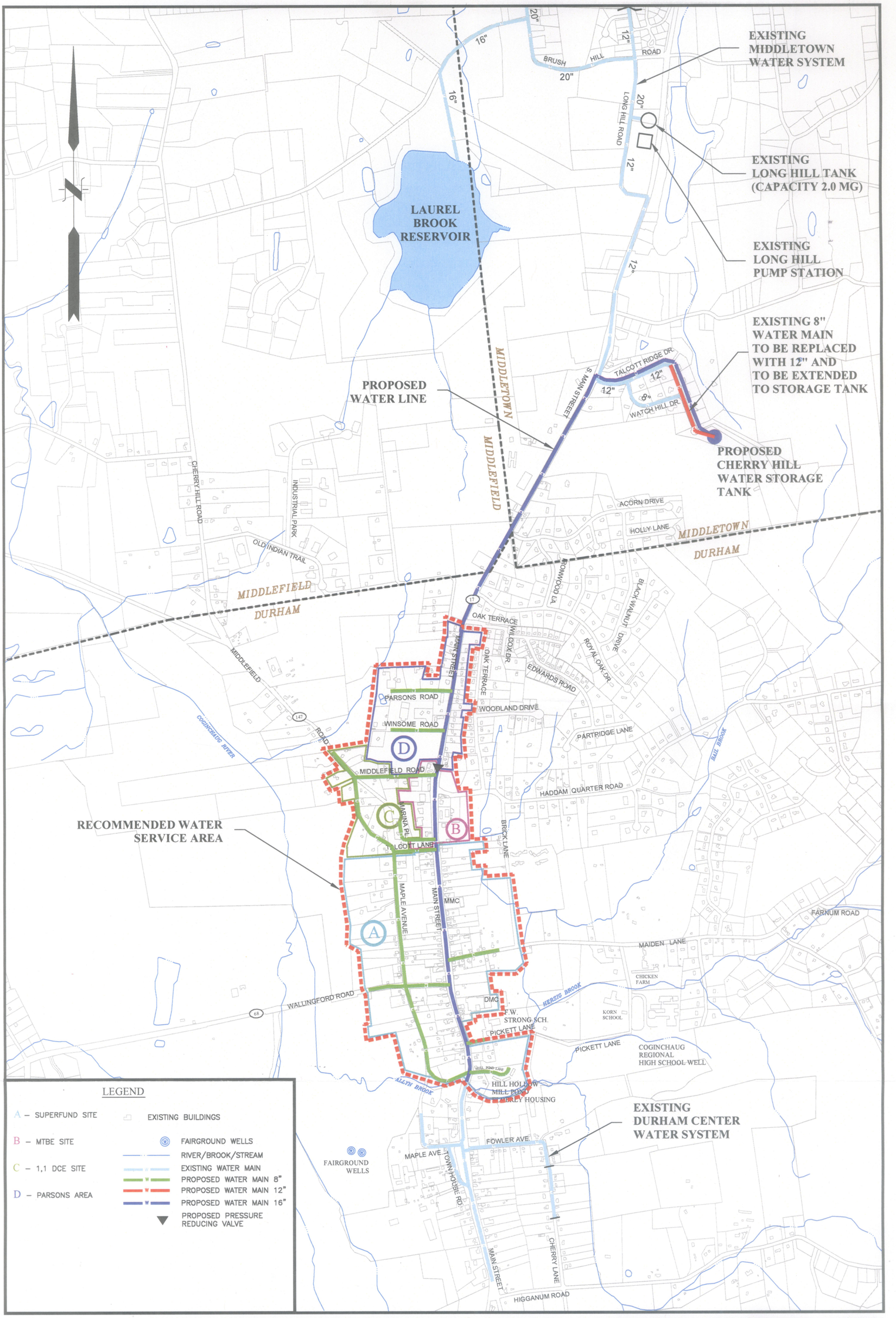

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DATE: AUGUST 2009

FIG.ES-5

RECOMMENDED SERVICE AREAS
ENVIRONMENTAL IMPACT EVALUATION
PIPE SIZING WITH FIRE PROTECTION

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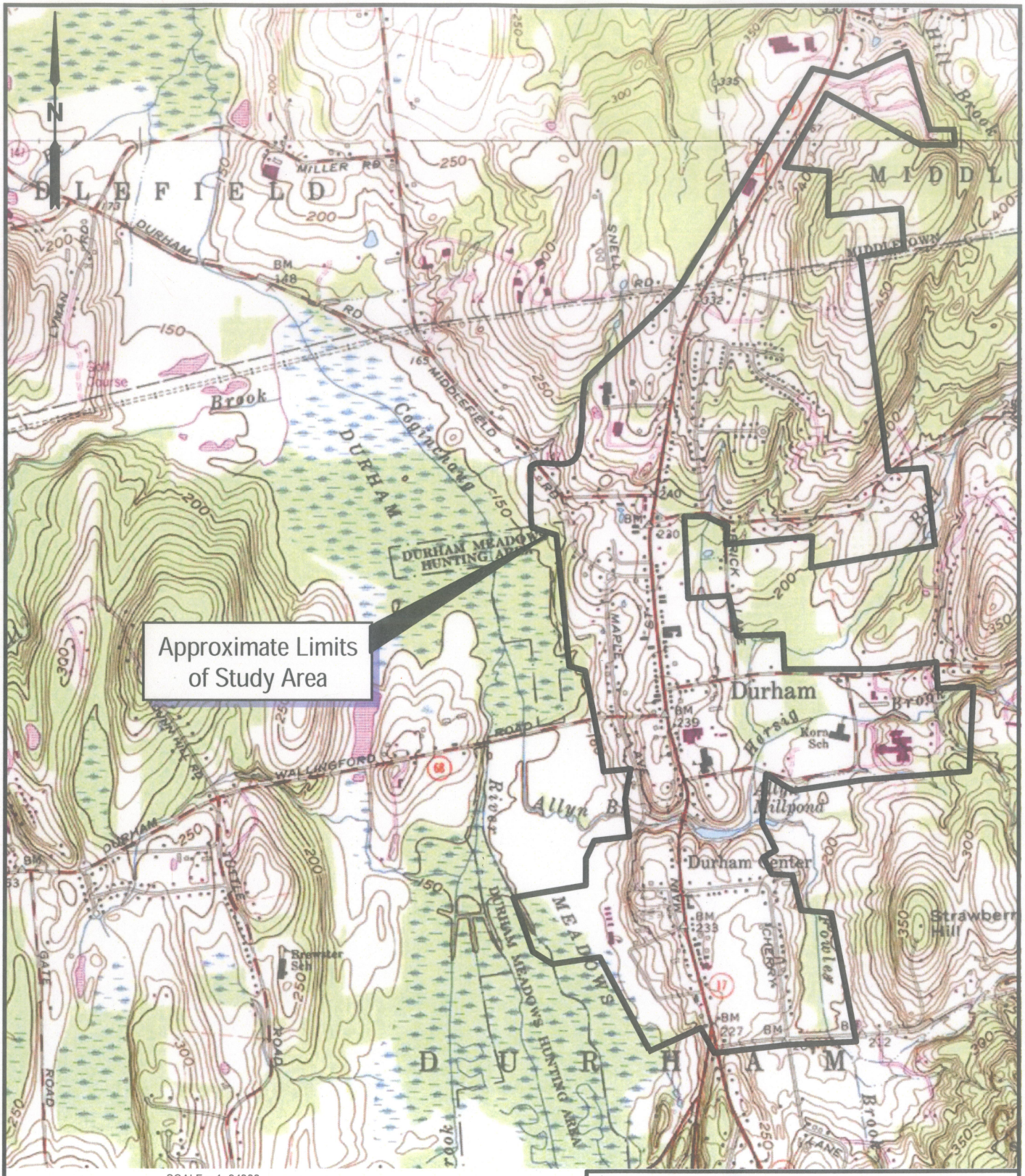

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MAP REFERENCE:

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MIDDLETOWN, CONN. 1965 PHOTOREVISED 1992
DURHAM, CONN. 1964 PHOTOREVISED 1984

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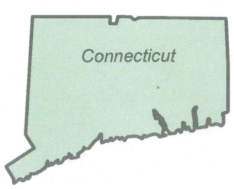
FIGURE 1-1



Quadrangle Location

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TOWN OF DURHAM

SITE LOCATION MAP

WATER SYSTEM EXTENSION FEASIBILITY STUDY UPDATE

DURHAM CONNECTICUT

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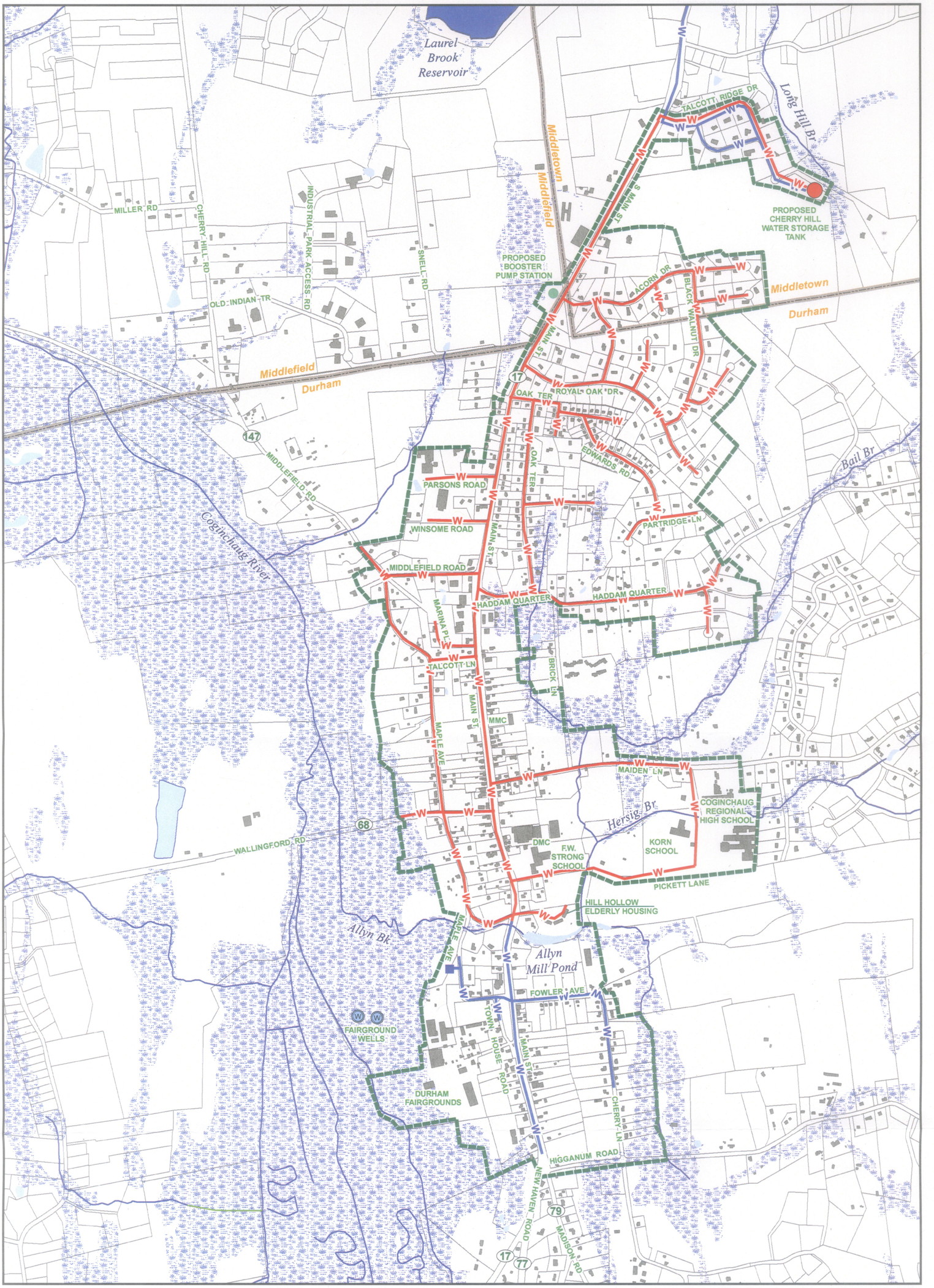

FIGURE 1-2 MAY 2009

Water
Wetlands
Water
Marsh Connector
Surface Water Reservoir

W Existing Water Main
W Proposed Water Main
Study Area

N
W E
S

0 500 1,000 2,000
Feet

PROJECT LOCATION
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

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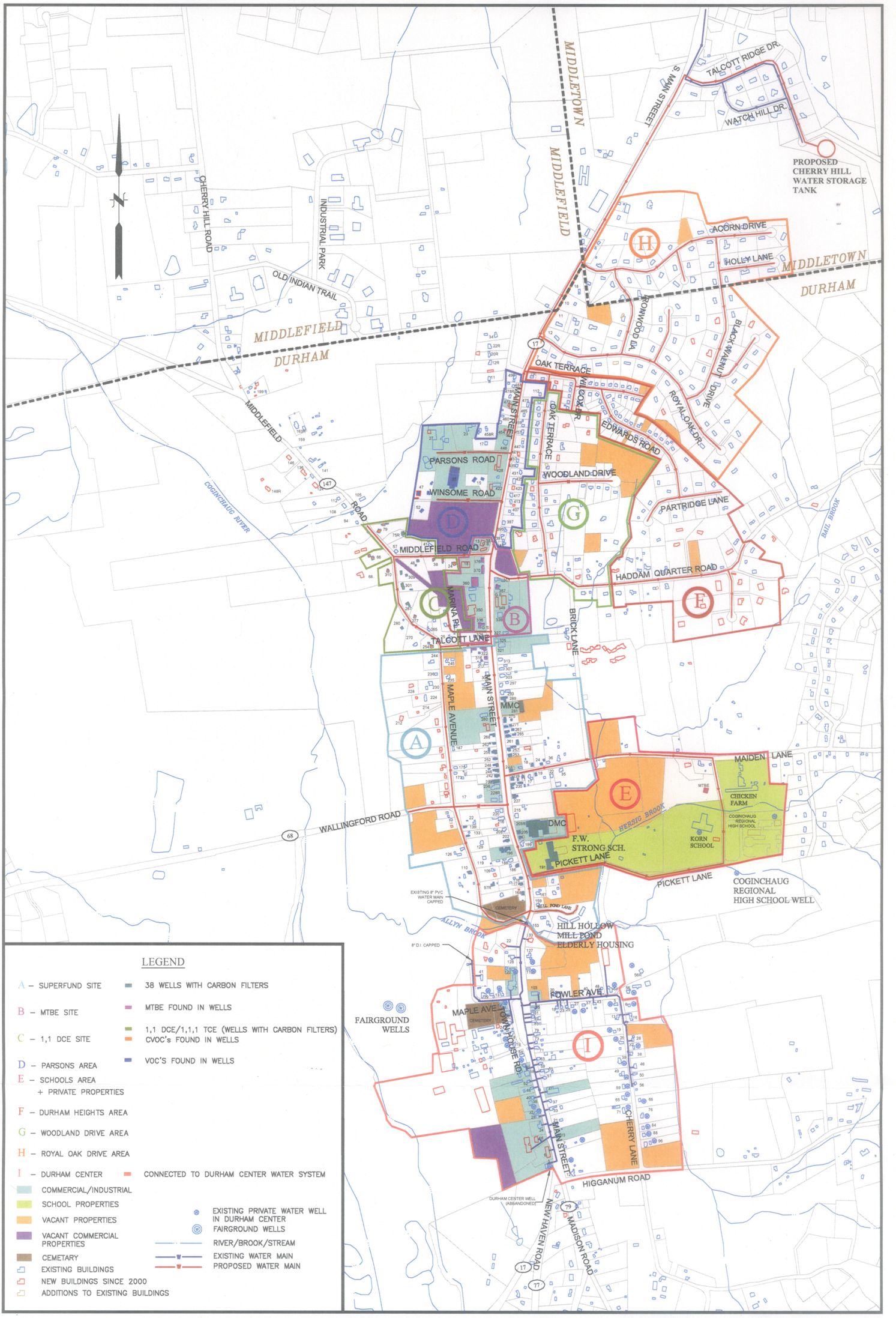

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DATE: AUGUST 2009

EIE-FIG.2-1

STUDY AREAS
ENVIRONMENTAL IMPACT EVALUATION
HISTORIC CONTAMINATED WELLS

DURHAM CONNECTICUT

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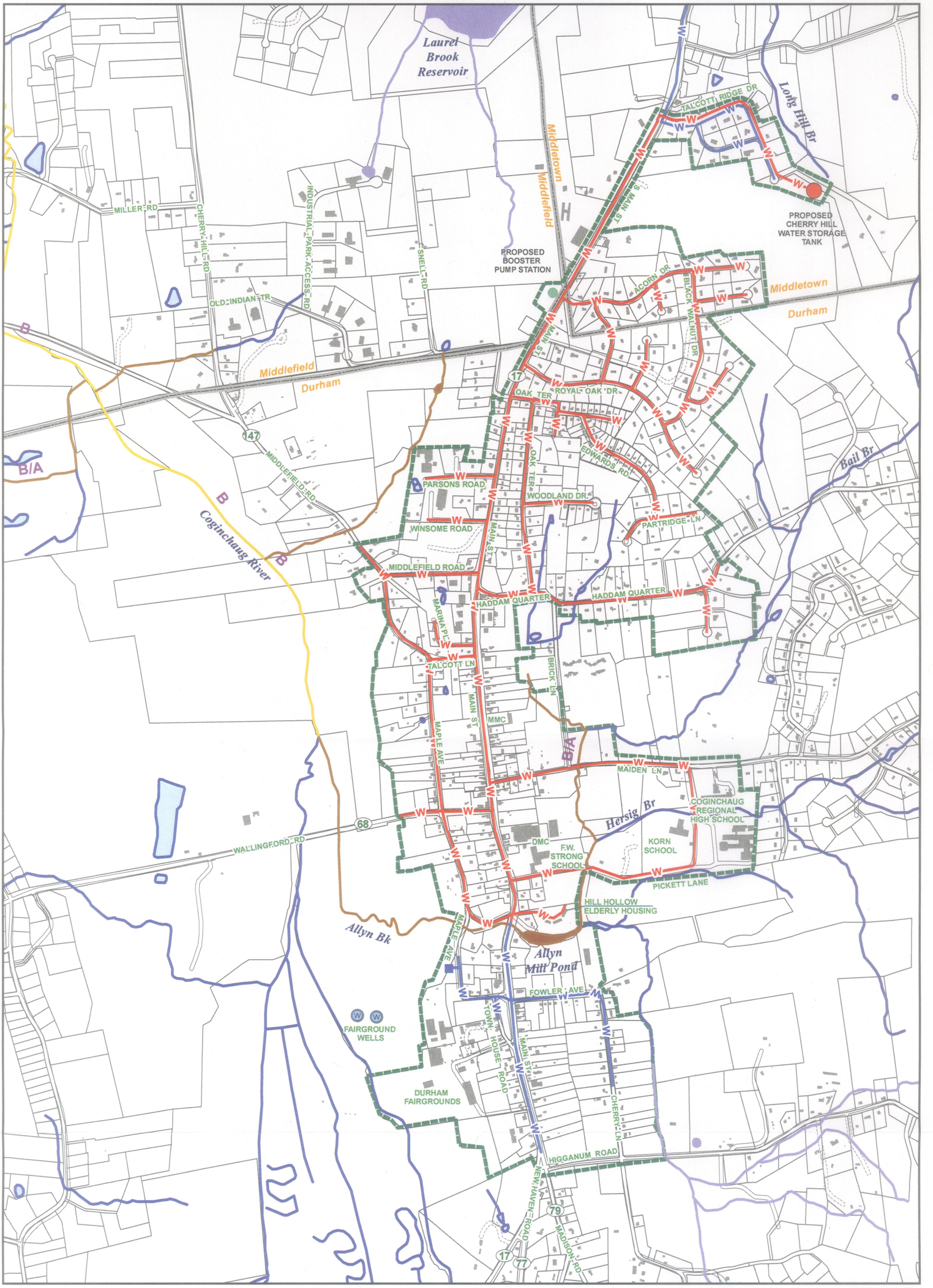

FIGURE 6-1 AUGUST 2009

Surface Water Quality Classifications

A	A	Study Area
AA	AA	Existing Water Main
B	B/A	Proposed Water Main
B/A	Dashed	
	Solid	

N W E S

0 500 1,000 2,000 Feet

SURFACE WATER QUALITY
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

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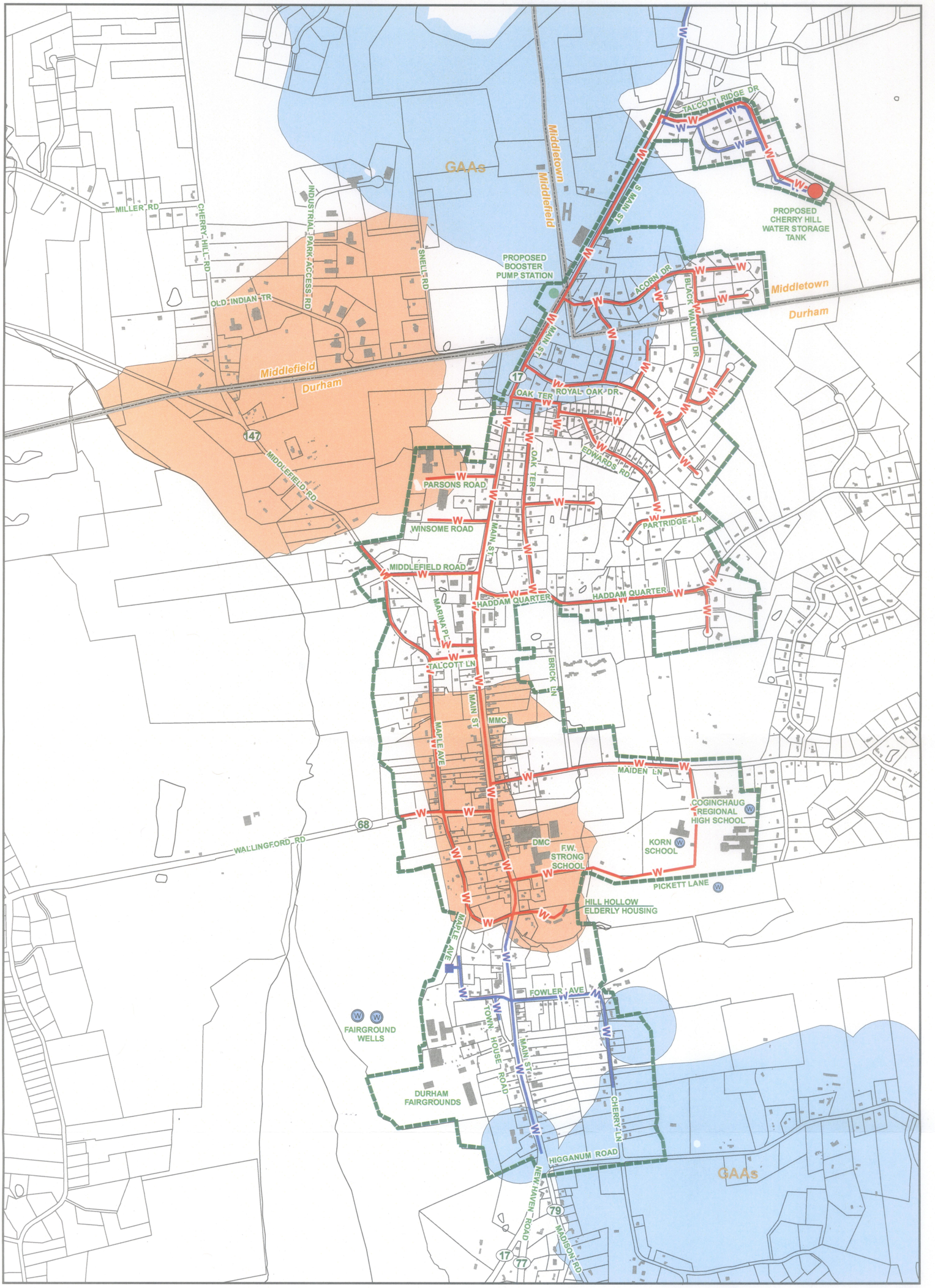

FIGURE 6-2 MAY 2009

W Proposed Water Main

W Existing Water Main

Study Area

GA

GAA, GAAs

GA, GAA May be impaired

N

W E

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0 500 1,000 2,000 Feet

GROUNDWATER QUALITY
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

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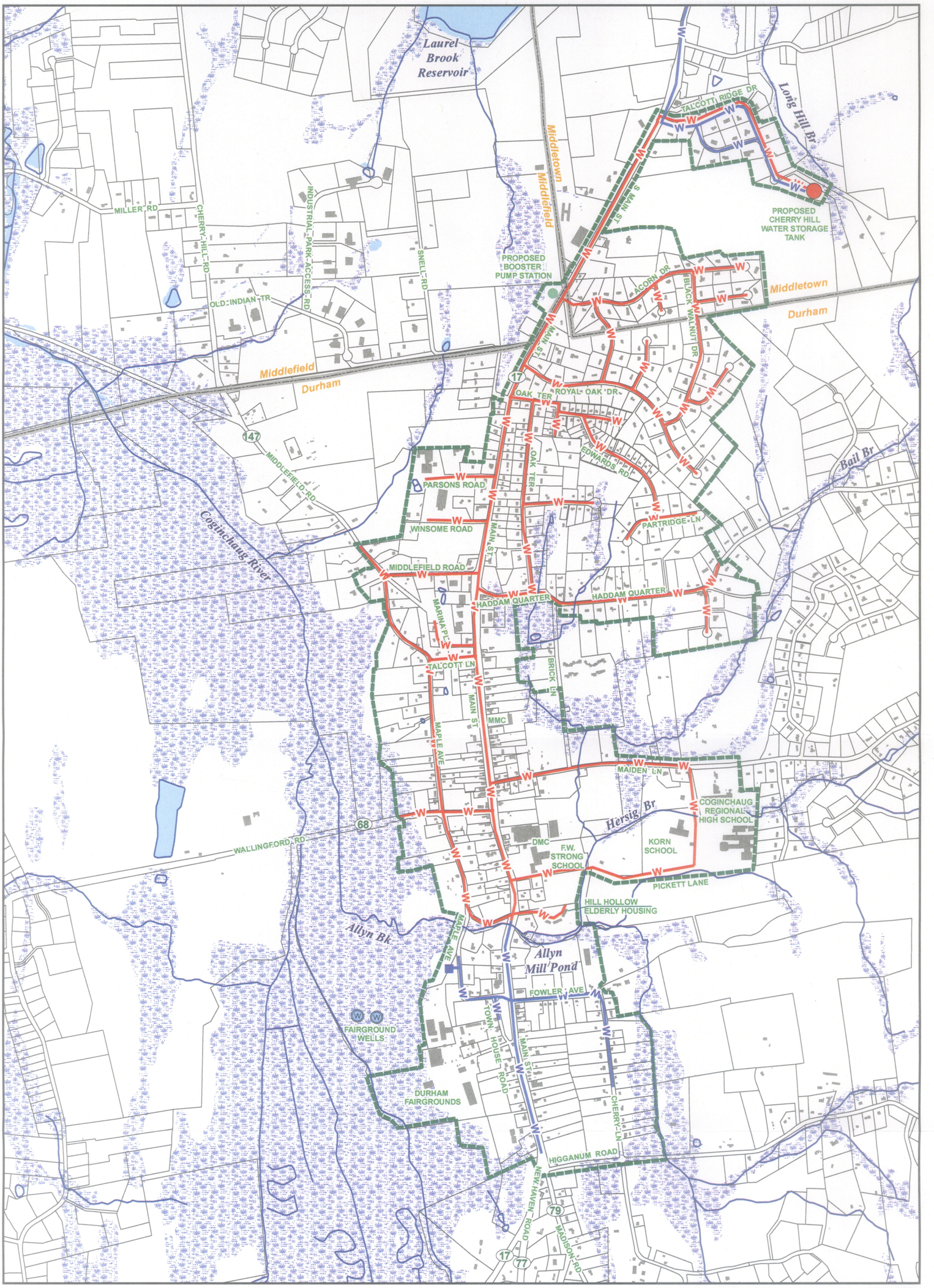

FIGURE 6-3 MAY 2009

Water
Water
Wetlands
Study Area
Proposed Water Main
Existing Water Main

0 500 1,000 2,000 Feet

N W E S

WETLAND MAPPING
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

K:\GIS\P98\98823\B20\MXD\Wetlands.MXD

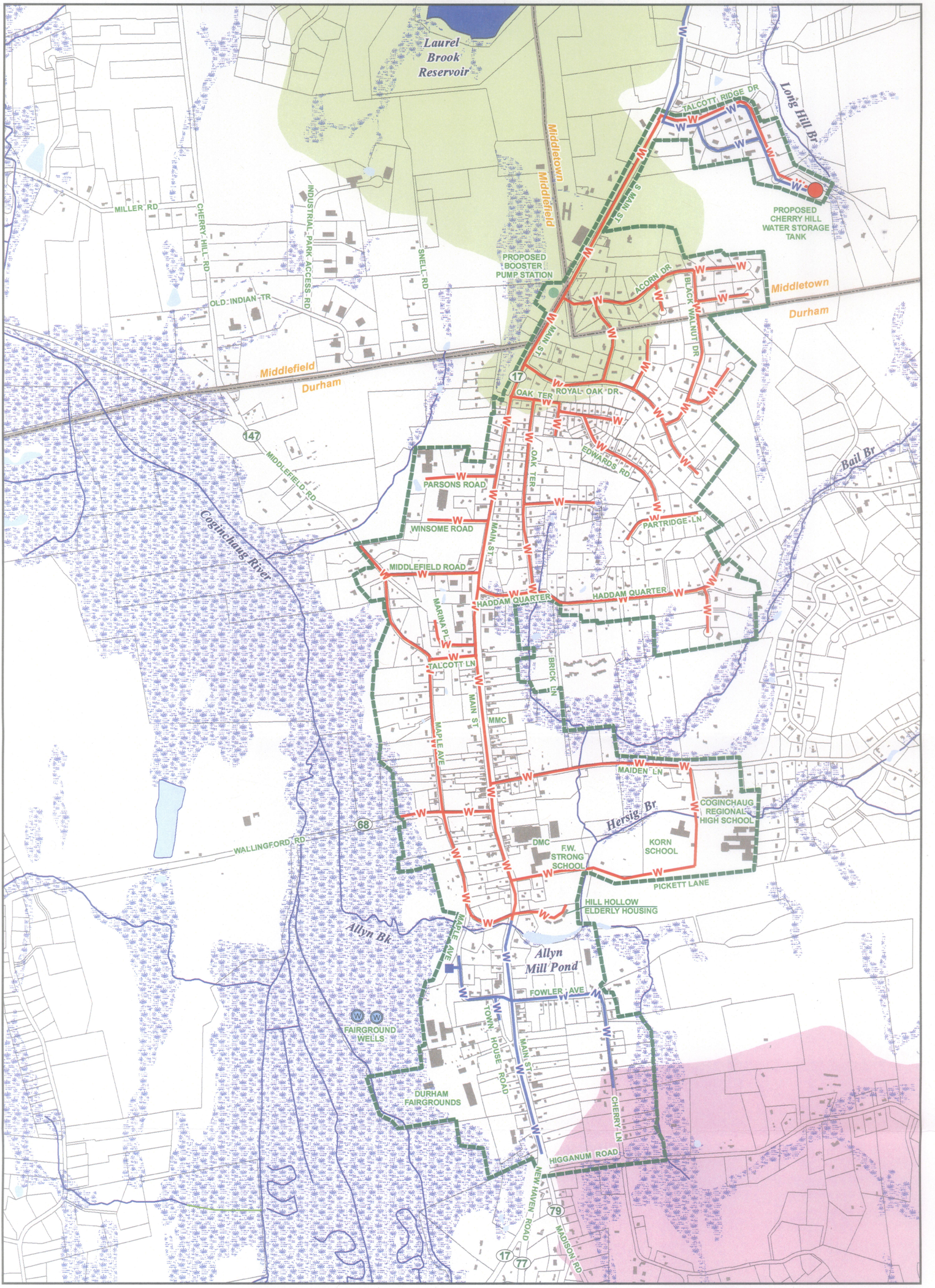

FIGURE 6-4 MAY 2009

Water

CLASS

- Wetlands
- Final
- Preliminary

Public Watershed STATUS

- Active
- Emergency
- Inactive

- Study Area
- Proposed Water Main
- Existing Water Main

N W E S

0 500 1,000 2,000 Feet

AQUIFERS & STREAM CROSSINGS
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

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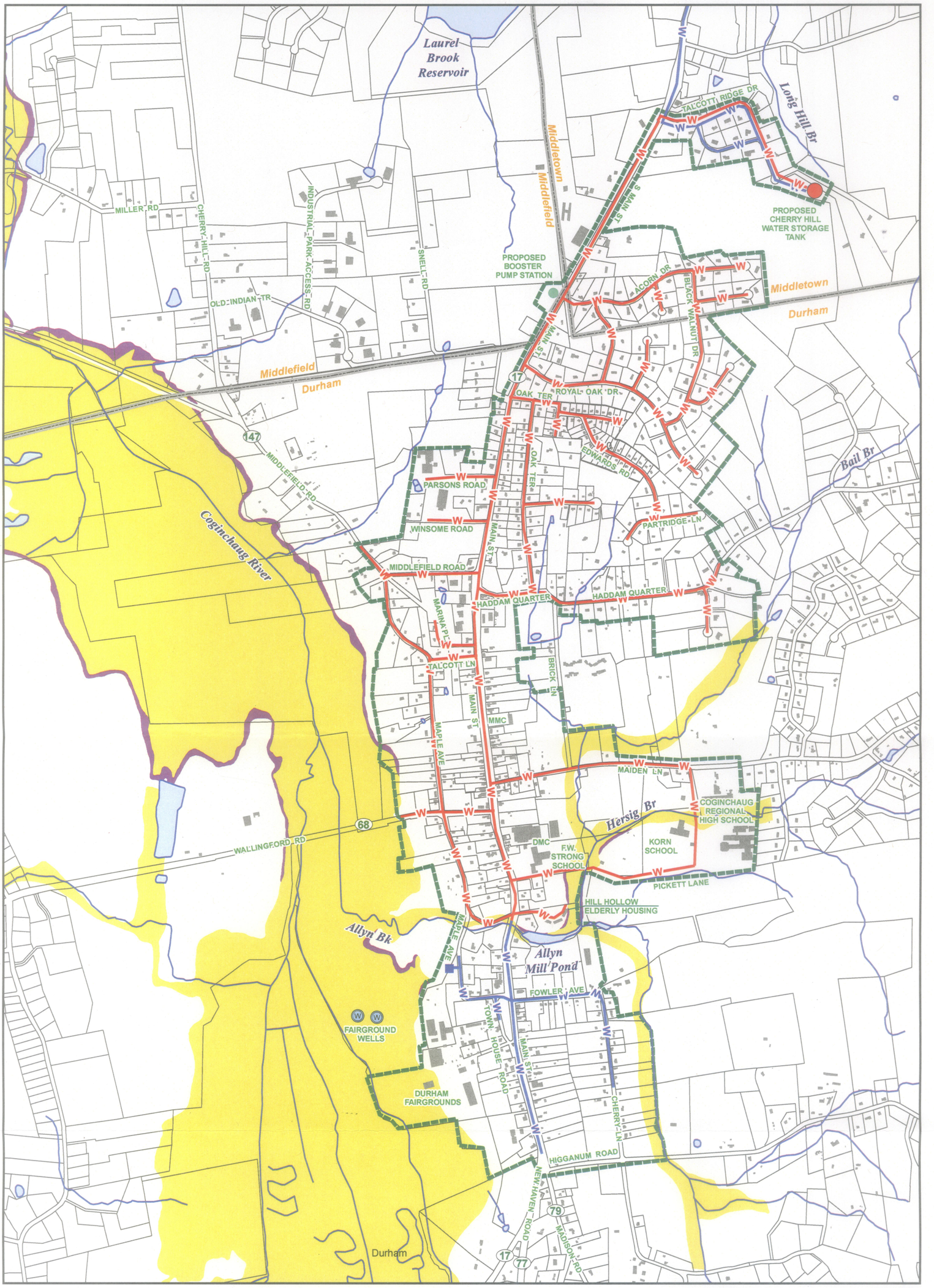

FIGURE 6-5 MAY 2009

General Flooding Classification

- 100 Year Flood Zone
- 500 Year Flood Zone
- Water
- Water

- Study Area
- Existing Water Main
- Proposed Water Main

0 500 1,000 2,000 Feet

N W E S

FEMA FLOOD PLAIN MAPPING

ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

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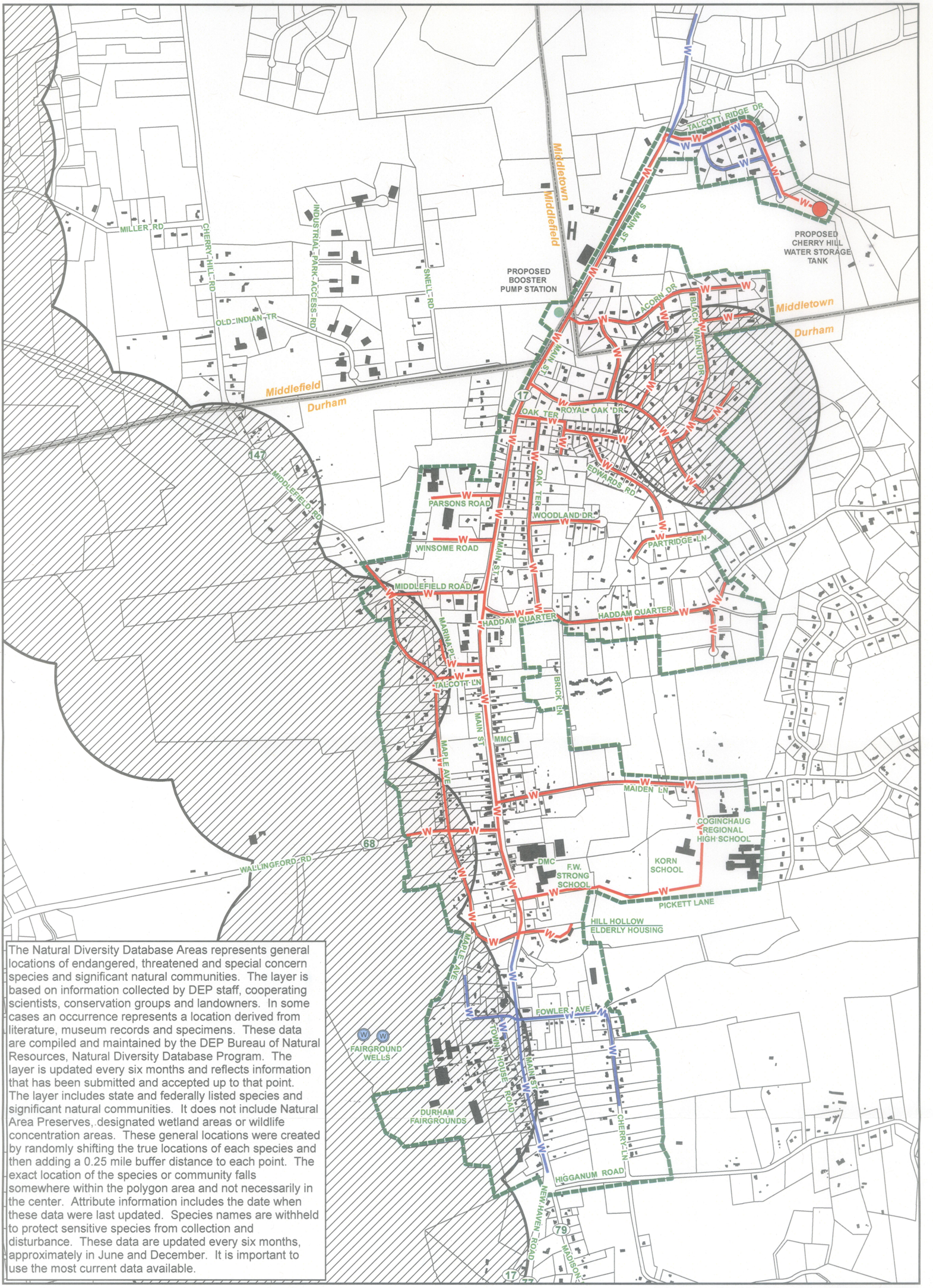

The Natural Diversity Database Areas represents general locations of endangered, threatened and special concern species and significant natural communities. The layer is based on information collected by DEP staff, cooperating scientists, conservation groups and landowners. In some cases an occurrence represents a location derived from literature, museum records and specimens. These data are compiled and maintained by the DEP Bureau of Natural Resources, Natural Diversity Database Program. The layer is updated every six months and reflects information that has been submitted and accepted up to that point. The layer includes state and federally listed species and significant natural communities. It does not include Natural Area Preserves, designated wetland areas or wildlife concentration areas. These general locations were created by randomly shifting the true locations of each species and then adding a 0.25 mile buffer distance to each point. The exact location of the species or community falls somewhere within the polygon area and not necessarily in the center. Attribute information includes the date when these data were last updated. Species names are withheld to protect sensitive species from collection and disturbance. These data are updated every six months, approximately in June and December. It is important to use the most current data available.

FIGURE 6-6 DECEMBER 2010

W Existing Water Main

W Proposed Water Main

Study Area

Natural Diversity Database Area

Natural Diversity Database downloaded from CT DEP GIS Data Web Site and last updated 12/1/2010.

N W E S

0 500 1,000 2,000 Feet

NATURAL DIVERSITY DATABASE
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

K:\GIS\P98\98823\B20\MXD\NDDB.MXD

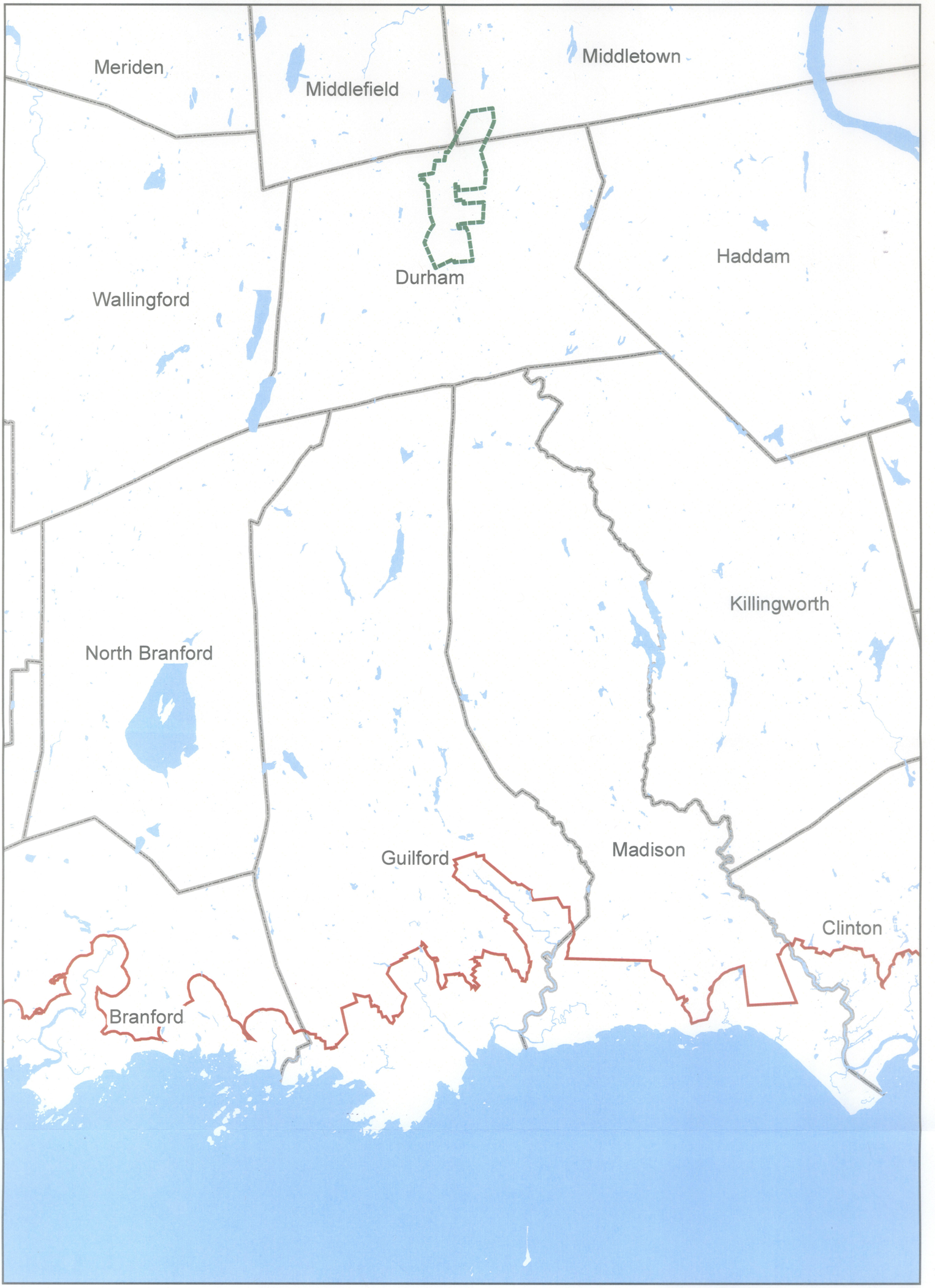

FIGURE 6-7 MAY 2009

StudyArea_Approx
Water
Coastal Boundary

N
W E
S

0 0.5 1 2 Miles

COASTAL AREAS
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

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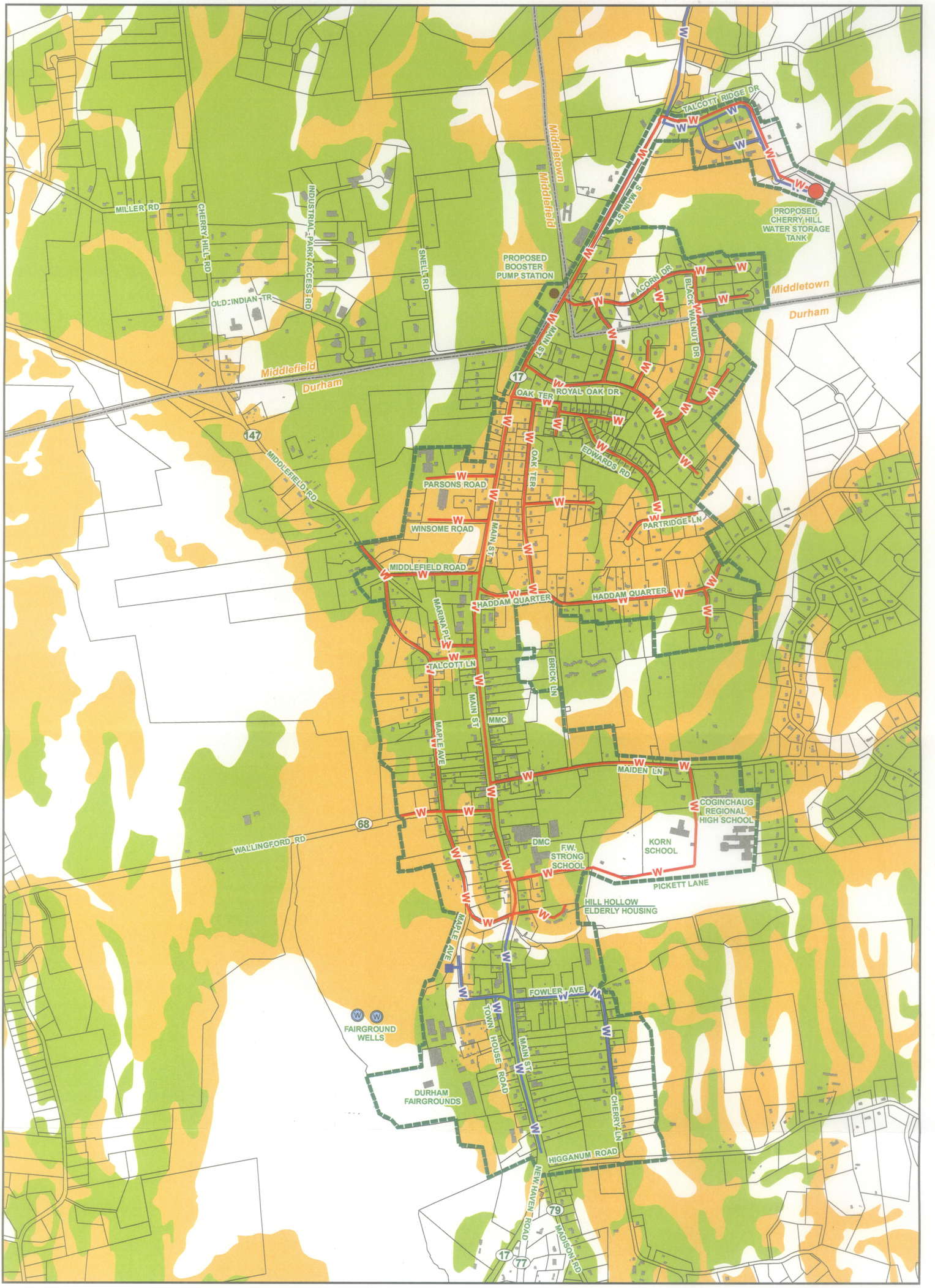

FIGURE 6-8 MAY 2009

Farmland Soils

- Prime Farmland Soils
- Additional CT Important Farmland Soils

- Study Area
- Existing Water Main
- Proposed Water Main

N W E S

0 500 1,000 2,000 Feet

PRIME FARMLAND
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

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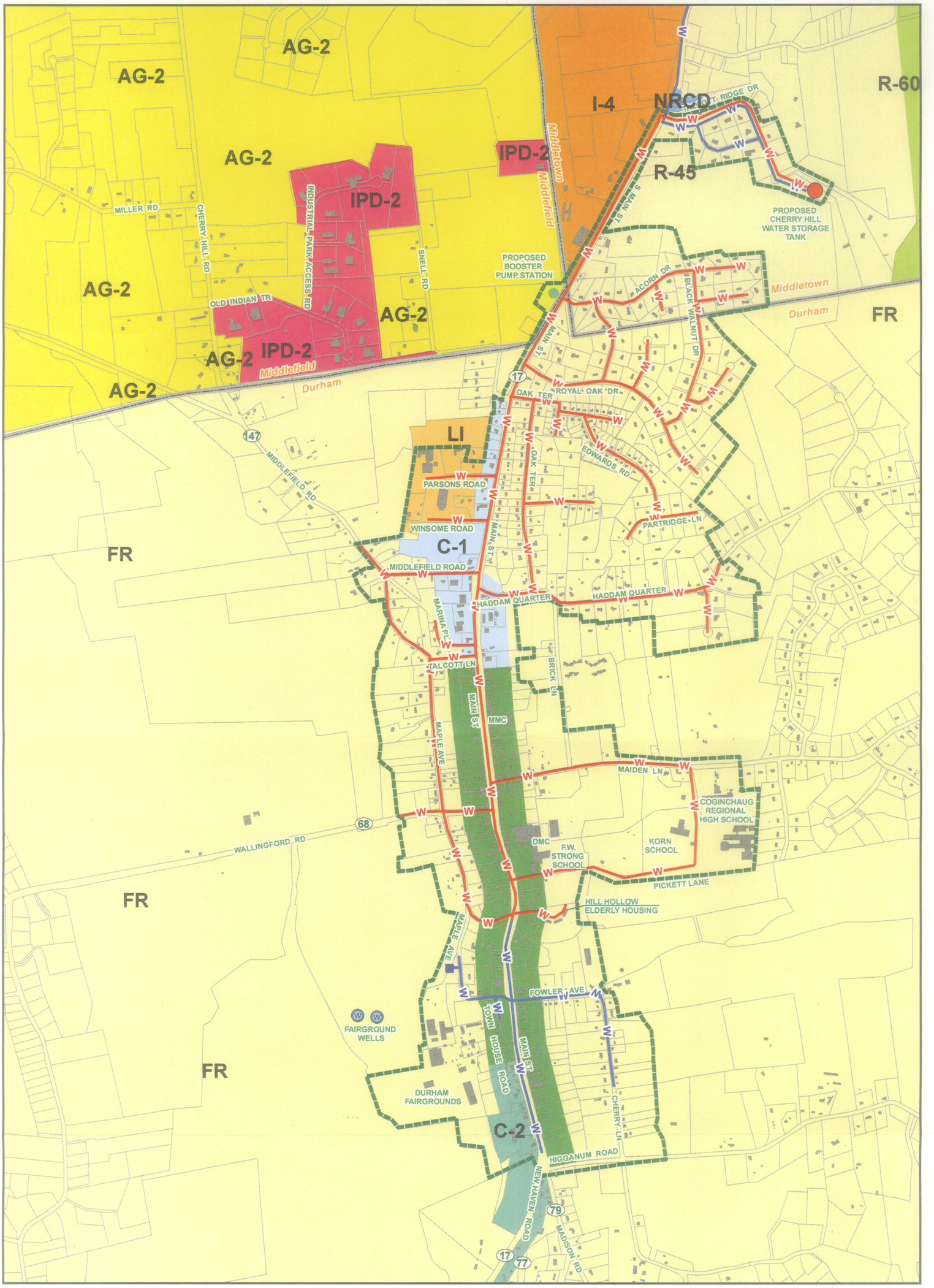

FIGURE 6-9 MAY 2009

Durham Zoning
- Farm Residential (FR)
- Main Street Residential (MR)
- Commercial (C-1)
- Commercial (C-2)
- Light Industrial (LI)

Middletown Zoning
- Residential (R-45)
- Residential (R-60)
- Commercial (NRCD)
- Limited Industry (I-4)
- Study Area

Middlefield Zoning
- Agriculture (AG-2)
- Industrial Park District (IPD-2)
- Existing Water Main
- Proposed Water Main

0 500 1,000 2,000 Feet

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ZONING MAP
ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

N W E S

FUSS & O'NEILL
Disciplines to Deliver

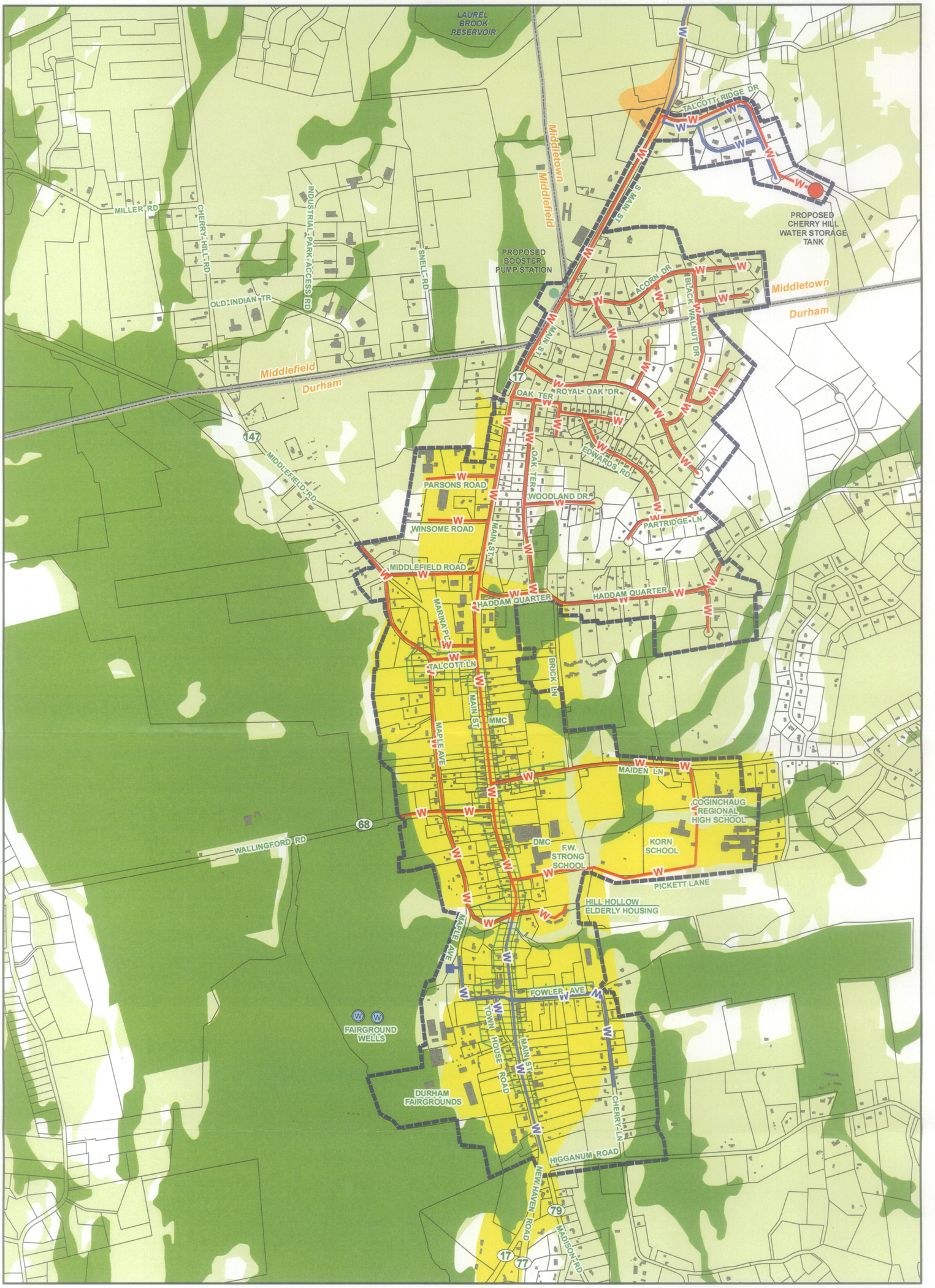

FIGURE 6-10 AUGUST 2009

Development Policies

- Growth Areas
- Rural Community Centers
- Preservation Areas
- Conservation Areas
- Rural Lands
- Historic Districts

- Existing Water Main
- Proposed Water Main
- Study Area

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N W E S

0 500 1,000 2,000 Feet

OPM CONSERVATION AND DEVELOPMENT LOCATIONAL GUIDE MAP

ENVIRONMENTAL IMPACT EVALUATION
WATER SYSTEM EXTENSION
TOWN OF DURHAM

A

Appendix A

Durham Water System Extension Feasibility Study Upgrade (Under Separate Binder)

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Appendix B

EPA Letter to Town of Durham (2008)
Other Correspondence to the CTDEEP regarding the Scope of the Update to the Feasibility Study Being Completed

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ONE CONGRESS STREET, SUITE 1100
BOSTON, MA 02114-2023

November 19, 2008

Laura L. Francis, First Selectman
Town of Durham
P.O. Box 428, 30 Townhouse Road
Durham, CT 06422

RE: Extension of Public Water to the Durham Meadows Superfund Site

Dear Ms. Francis:

The United States Environmental Protection Agency (EPA) is responding to discussions with the Town of Durham and the Connecticut Department of Environmental Protection (CT DEP) regarding the extension of the Durham Center Water System to service a portion of the Durham Meadows Superfund Site.

In 1982, after contamination was discovered in private drinking water wells, under a CT DEP order, Merriam Manufacturing Company (MMC) and Durham Manufacturing Company (DMC) installed carbon filters on impacted residential wells. Since then, the two companies have monitored and maintained up to 38 filtered wells on at least a quarterly basis. DMC is responsible for servicing 14 of these wells. MMC is responsible for servicing 24 of these wells, but ceased these activities in late 2004; CT DEP has taken over monitoring and maintenance of these locations.

As outlined in EPA's Record of Decision, dated September 30, 2005, EPA's selected remedy for the site-wide area of groundwater contamination at the Durham Meadows Superfund Site is extension of the Middletown Water Distribution System from the City of Middletown south along Route 17 to all residences currently affected by groundwater contamination and a buffer zone of residences located near the contaminated area. EPA prefers this alternative because it provides the most long-term effectiveness and permanence to address the risk to human health at all affected and surrounding wells within the Superfund site and also because the Middletown Water Distribution System has the capacity to serve the Superfund site. Such an extension may be able to address other contaminated areas within the Town.

Development of a new groundwater source and distribution system was retained in the Record of Decision as contingency measure in the event that the connection to the Middletown Water Distribution System could not be implemented for administrative or other reasons. At the time the Record of Decision was issued, the Town of Durham, in conjunction with the Connecticut Department of Public Health, was still investigating the potential use of the Durham Fairgrounds Wells for a future source of water to the Durham Center System, and the capacity of the Fairgrounds Wells was still in question.

Now, the Durham Center Water System is indeed served by the Fairgrounds Wells, and it appears that the Fairgrounds Wells have the capacity to serve additional locations. EPA does not, however, support extending the Durham Center Water System to the Superfund site without significant additional investigation and evaluation, due to the potential risk of the Fairgrounds Wells being contaminated by contaminants in groundwater from the Superfund site.

The Durham Fairground Wells are less than 1,000 feet south of Allyn Brook, and the straight-line distance from these wells to the boundary of Superfund site groundwater contamination is approximately 1,200 feet. The groundwater plume at the Superfund site generally travels from the northeast to the southwest, which is generally towards the Fairgrounds Wells. Also, a bedrock fault, called the Ball Brook fault, cuts directly through the site near DMC in the same general direction of groundwater migration in bedrock. This fault could facilitate the migration of the contamination towards the Fairgrounds Wells.

Although the current boundary of the groundwater plume is expected not to extend beyond the Technical Impracticability Waiver Zone as outlined in Figure 8 of EPA's Record of Decision, very little monitoring data currently exists for any contaminants associated with the site south of Allyn Brook. The southernmost impacted wells at the site, located north of Allyn Brook at 168 and 174 Main Street, are among the most highly contaminated bedrock wells within the entire Superfund site area. As part of EPA's selected remedy to provide the water main extension from the City of Middletown, the remedy includes implementing a monitoring well network within and outside of the current known boundaries of the overall groundwater plume to ensure the plume does not migrate beyond the limits of the Technical Impracticability zone.

If the Fairgrounds Wells are connected to the Superfund site, they will be pumping directly downgradient of the Superfund site, while at the same time providing an influx of water into the contaminated groundwater at the Superfund site. This scenario may result in an increased risk that contaminated groundwater will migrate from the Superfund site to the Fairgrounds Wells thus contaminating that source. Contamination of the Fairgrounds Wells would require the wells to be treated prior to distribution, which would significantly increase the current operating cost of this system.

Note also that extending the Durham Center System to service the southern portion of the Superfund site would still require an extension from the Middletown System to service the northern portion of the site. Given the risk of contamination of the Fairgrounds wells, such an approach is neither cost-effective nor technically sound.

Last, EPA wishes to note that it did not see huge differences in the capital cost estimates between the alternatives of the water main extension from the City of Middletown and the development of a new groundwater source and water distribution system within the Town of Durham. (These cost estimates are presented in detail in EPA's Draft Final Feasibility Study Report, dated June 2005.) Both alternatives require the construction of

distribution infrastructure within the Superfund site area, which accounts for most of the capital costs for construction and implementation. The need for treatment due to contaminant migration would obviously increase the cost of the in-town well alternative, whether it be the Fairgrounds Wells or some other location. Federal and state agencies generally prefer clean water supply options over contaminated sources or sources at risk of contamination.

EPA's preferred remedy for the alternative water supply to the Durham Meadows Superfund Site is still the extension from the City of Middletown. Please consider this letter in your evaluation of the water supply for the Town of Durham.

Please feel free to call me at 617-918-1273 if you have any questions or wish to discuss this letter.

Sincerely,

Anni Loughlin
Project Manger

cc: Mary Jane O'Donnell, Chief, ME/VT/CT Superfund Section
John W. Kilborn, Senior Enforcement Counsel
Martin Beskind, CT DEP

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

November 21, 2008

Mr. Martin Beskind
Remediation Division
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106

RE: Notice of Scoping for the Engineering Study for the Extension of Public Water System from Middletown to Durham

Dear Mr. Beskind:

The Department of Public Health Drinking Water Section's Source Water Protection Unit has reviewed the above scoping notice. Please refer to the attached report for our comments.

If you have any questions regarding these comments, please call Pat Bisacky of this office at (860) 509-7333.

Sincerely,

Lori Mathieu
Public Health Services Program Manger
Drinking Water Section

Cc: Darrell B. Smith, Section Chief, DWS
Michael Hage, Section Supervisor, DWS
file

Phone (860) 509-7333
Telephone Device for the Deaf: (860) 509-7191
410 Capitol Avenue - MS # 51WAT
P.O. Box 340308 Hartford, CT 06134

Appendix C

Letter from the DeFelice Family and DEEP Response

log letter
#12-106

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

August 7, 2012

Frank & Debra Defelice
32 Cherry Lane
Durham , CT 06422

RE: Letter raising concerns regarding the supply of potable water to the Town of Durham and Request for Information under Connecticut's Freedom of Information Act. (FOIA)

Dear Mr. and Mrs. Defelice,

The Connecticut Department of Energy and Environmental Protection ("DEEP") is in receipt of your letter regarding your concern whether State and Federal entities have properly evaluated all reasonable sources of drinking water options to serve the area in and around groundwater contamination associated with the Durham Meadows Superfund site. I'd like to take this opportunity to assure you that the DEEP, along with our partners from the Connecticut Department of Public Health ("DPH"), Federal Environmental Protection Agency ("EPA") , and the towns of Middletown, and Durham have looked at every reasonable option and have concluded that a water main extension from Middletown is not only cost effective, but will produce a long term safe supply of drinking water to the affected areas in an expedient manner.

Let me begin by addressing some of the issues you bring up in your letter dated July 12, 2012 which may help clarify to you why the solution of bringing water from Middletown is the only preferred safe, cost effective way to supply drinking water to the area.

All of the parties involved have been working very hard to resolve and settle on a viable source to supply the area with a safe long term supply of drinking water. This process has been ongoing since approximately 2005 when EPA issued a Record Of Decision ("ROD") for the Durham Meadows Superfund Area which identified Middletown as the most likely and expedient option. The Federal ROD also underwent a significant public comment process at the time it was issued. On November 12, 2008, DEEP led a meeting along with representatives from DPH to undertake a study to evaluate the sources of drinking water for the area. DEEP opened up the meeting for public comments and received several from various parties. The Department along with the Town and EPA, in a public meeting, presented the results of this Feasibility Study ("FS") and Environmental Impact Evaluation ("EIE") completed by Fuss and O'Neill on March 23, 2011 and published in a local paper identifying other potential sources of water and why they are not viable for the purposes of supplying a long term safe supply of drinking water to the area. No proposals, engineering, or scientific information citing your parcel as a potential supply was submitted at any time through this process.

In order to consider your property there would have to be a demonstration of long term water quality, quantity, compliance with critical health requirements for siting, diversion permitting, and an assessment of the possibility of moving the contaminant plume from its current location once drinking water wells are taken offline. Only the presentation of detailed scientific study and engineering report would be able to address the possibility that the subject property might meet community needs for a long term, safe, professionally managed water supply. Such study and reporting is very costly, has limited probability in this case and the property is not currently owned by a public entity. We cannot recommend the investment of public funds for the purpose of research and investigation on private property for this purpose.

The public entities believed and still believe that all viable options have been explored and that any further delays will jeopardize funding on both State and Federal fronts. Therefore, both the Department of Energy and Environmental Protection and Department of Public Health are working to approve the FS and EIE identifying Middletown as the only source for the Durham Superfund Area.

Your FOI request is being processed by DEEP and you will be notified when the documents have been assembled and a page count is available. Please note that there is a twenty five cent per page charge for copies of documents and that if the total is greater than forty pages, prepayment will be required. It is expected that the document total will reach many hundreds of pages.

I hope this addresses your concerns and clarifies any questions you may still have. If you have any further questions or comments please contact Patrick F. Bowe of my staff at (860) 424-3762 or Gil Richards who is the project manager for the site at (860) 424-3523.

Sincerely,

Macky McCleary
Deputy Commissioner

Wingfield
12-106
due 8-1-12

Frank & Debra DeFelice
32 Cherry Lane
Durham, Connecticut 06422
Telephone 860-690-2400
fcdefelice@aol.com

July 12, 2012

Mr. Daniel C. Esty
Commissioner
Department of Environmental Protection
State of Connecticut
79 Elm Street
Hartford Connecticut 06106

RE: Lack of Diligence regarding the supply of potable water to the Town of Durham and Request for Information under Connecticut's Freedom of Information Act (FOIA)

Dear Commissioner Esty,

We are writing to convey our disappointment with your department regarding its failure to consider a local and far less expensive source of potable water, for the nearly one-dozen homes in Durham, Connecticut which are unable to obtain potable water from their wells, due to chemical contamination.

We believe that all residents are entitled to clean drinking water; however, we strongly disagree that running a new water line from the Town of Middletown to the Town of Durham, at a cost of more than thirteen million dollars ($13,000,000) is the best alternative; especially when those involved in the planning and funding of this project have knowledge that an alternate solution exists.

We are the owners of a 37.5 acre parcel, which was tested by the Aquasource Water Company in 1990 (Aquasource then had sole distribution rights to the Town of Durham). The company has since relinquished these rights to the Town of Durham, which now manages its own public water system.

According to published reports, testing conducted at that time indicated that our parcel had the ability to provide potable water for up to 400 homes. An additional benefit is that the parcel is located immediately south of Durham's Center, proximate to its municipal water distribution piping; yet far away from underground plumes and other potential sources of contamination.

We believe that the purchase, engineering, well development and connection costs associated with this option would be approximately <u>one-third</u> of the price to connect to the City of Middletown.

We also note that *Smart Growth* principles (particularly regarding infrastructure) suggest that rural communities, such as Durham, should be encouraged to develop their own public water systems; as this helps reduce sprawl, and reduces the costs associated with installation and maintenance of the infrastructure required to transport water from larger, neighboring cities (e.g. Middletown). Upon completion of this $13,000.000 pipeline, it can reasonably be concluded that other Durham residents will be required to connect to it, to offset its cost; regardless of the water quality of their present wells.

C.G.S. Section 22a-471 states that any water company which is applying for a grant shall include a "description in detail of the problem, area and population affected by pollution of the groundwaters; *<u>alternate solutions</u>*, *<u>including relative cost of construction or installation, operation and maintenance</u>*".

The availability of our property as a solution has long been known by the First Selectmen of the Town of Durham and the Manager of the Water & Sewer Division of City of Middletown. Still, they have continued to solely advance the concept of running a line from Middletown to Durham. We believe that all parties involved have an obligation to assess <u>all</u> the available options; particularly when public funding is being requested. <u>This has clearly not been done.</u> Because this project has not yet received your department's approval, we request that your department refrain from issuing a recommendation, until a reasonable level of due-diligence has been performed regarding this alternative solution. We believe a local solution would be far less costly, and ultimately more beneficial to the Town of Durham.

Request Under the Freedom of Information Act (FOIA):

By this letter, and in accordance with Connecticut's Freedom of Information Act (FOIA) we are formally requesting copies of all communications and correspondence which have occurred during the period of July 3, 2011 through July 3, 2012 from, to, with or between employees and consultants of the State of Connecticut Department of Energy and Environmental Protection (DEEP or DEP) and from, to, with or between others, including representatives of the Town of Durham, City of Middletown Water & Sewer Department, EPA or State of Connecticut Department of Health, which are related to the current or potential future supply of water to the Town of Durham, Connecticut, whether such correspondence is written or oral, formal or in notation form, in electronic or paper formats.
We hereby agree to pay standard and customary rates for reproduction of all materials requested.

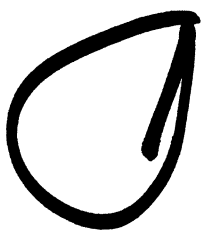
Respectfully,

Frank C. DeFelice

Frank C. DeFelice

Debra A. DeFelice

Debra A. DeFelice



Appendix D

South Central Connecticut Regional Water Authority Proposal (Water Main Extension to Durham)

South Central Connecticut Regional Water Authority
90 Sargent Drive, New Haven, Connecticut 06511-5966 203.562.4020
http://www.rwater.com

May 13, 2011

Ms. Lori Mathieu
State of Connecticut
Department of Public Health
Drinking Water Section
410 Capital Avenue, MS #51WAT
P.O. Box 340308
Hartford, CT 06134-0308

Re: Service to Durham

Dear Ms. Mathieu:

At your request, the South Central Connecticut Regional Water Authority (SCCRWA) is pleased to submit options and cost estimates for providing potable water service to portions of the Town of Durham. The estimates contained herein are preliminary estimates. Final estimates could be provided after engineered designs are completed, should the department wish to pursue this further with SCCRWA.

The groundwater in portions of Durham along Route 17 is contaminated. This is due primarily to historical land uses that included industrial production and fuel stations. One hundred properties north of Allyn Brook are within a designated Environmental Protection Agency (EPA) Superfund site identified as "Area A". The September 2010 "Durham Water System Extension Feasibility Study" by Fuss & O'Neill (F&O) was used as a basis for demands, distribution main sizing, tank sizing, distribution main location, and number of services in our investigation.

Executive Summary

SCCRWA could supply Durham from our existing distribution system in North Branford. The construction of a small booster pumping station would be required in addition to approximately eight miles of transmission main. Additional distribution main would be required within Durham. SCCRWA could provide service to the Superfund site located in the center of Durham for a cost of $13.7 million. The area would be supplied by a hydropneumatic tank and pumping station, with fire protection provided by fire pumps at the pumping station. A more reliable (and recommended option) for serving the Superfund site would supply fire protection from a new storage tank in lieu of fire pumps at an estimated total project cost of $15.0 million. SCCRWA could supply all of the areas identified by F&O within the town of Durham at a total project cost of $19.7 million. A detailed cost estimate based is attached to this letter as Table 1.

Modeling

A hydraulic model was developed from our existing Clintonville-Northford model. Aerial photographs from GIS were imported to the model to accurately layout the proposed transmission main. Elevations were taken from USGS maps and the demands developed by F&O were used for the customers in Durham.

Supplying Durham would require the construction of approximately eight miles of transmission main. The proposed transmission main would connect to SCCRWA's existing distribution system at an existing 16-inch water main located at the intersection of Route 17 and Route 22 in Northford. The transmission main would continue north along Route 17 through North Branford and Durham and stop at the intersection of Route 17 and Route 79. To serve the Superfund site, a combination of 16-inch and 20-inch main is required. If SCCRWA chose to extend service to Middletown, a 20-inch main would be needed to sustain a flow of three million gallons per day (mgd).

The potential transmission main along Route 17 would cross through the existing exclusive service area held by the Connecticut Water Company (CWC). SCCRWA's modeling and cost analysis assumes that the main extension would be approved by the Connecticut Department of Public Health. Options for service along the route of the transmission main including a wholesale agreement with CWC or revision of the exclusive service area boundary have not been considered as part of this analysis.

SCCRWA's existing Clintonville Pumping Station would be the source of supply for the proposed Durham service areas. The future demand from SCCRWA's customers and Durham's totals approximately 2.7 mgd. The Clintonville Pumping Station has two existing pumps capable of 2.2 mgd each. Therefore, it is not anticipated that any upgrades to the pumping station will be required to serve Durham. If SCCRWA was requested to supply wholesale water to Middletown, an additional pump and variable frequency drive would need to be installed. The Clintonville Pumping Station was designed with extra piping, conduits and controls to easily facilitate future expansion. The cost to increase capacity would be minimal ($150,000) compared to the scope of the project.

Our existing Clintonville Pump Station would pump water toward a new booster pumping station along Route 17. This new pump station is necessary in order to pump water over a large hill located on the North Branford/Durham town line with an elevation of 338 feet. This pump station could be located on SCCRWA property near the Northford Diversion eliminating the need to purchase additional property. A fire flow of 3,500 gallons per minute (gpm) is needed for the Superfund area in Durham. While a fire pump can supply this flow, larger piping would be needed to pump water through the eight miles of proposed transmission main needed to reach Durham. A storage tank located on the discharge side of the pumping station is recommended to reduce the main size, provide more reliable fire flows and provide redundancy.

The transmission main would draw water from SCCRWA's Northford Service Area. Northford has a hydraulic grade line (HGL) of 343 feet. This is only 5 feet higher than the hill near the town lines. The proposed pumping station and tank would have a HGL at approximately 420 feet. This would maintain a pressure of 35 pound per square inch (psi) at the peak of this hill. Due to headlosses over the long transmission main, modeling indicates that the center of Durham would be served at a HGL between 390 and 400 feet. This will provide pressures of approximately 75 psi.

Two alternative tank sites were located based on elevation and aerial photographs. Only one storage tank would be needed to serve Durham. No other research regarding the purchase of these properties and no site visits were conducted. One location, the "North Tank" is located near the Middletown / Durham town line. The other tank location, "Middle Tank", is near Durham's southern border approximately 5 miles north of our existing system, along the proposed transmission line. The tanks would be approximately one million gallons in volume to serve the expanded areas in Durham. The tank size would be reduced to 750,000 gallons if service is provided to only the Superfund site. Both tanks work well hydraulically and are estimated to be similar in cost. Generally, the Middle Tank would be preferred as the Middle Tank location is nearer to the SCCRWA's existing service areas, and this location would help reduce maintenance / travel costs and provide a faster response for emergencies.

Five alternatives for service to Durham were identified and analyzed as described below:

1. Superfund Only – Fire Pump: Service provided to the Superfund area in Durham only; includes fire service provided through fire pumps; no water storage tank.

2. Superfund Only – Middle Tank: Service provided to the Superfund area in Durham only; includes fire service provided through a new 750,000 gallon storage tank at the "Middle Tank" location.

3. Service to Durham – Middle Tank: Service provided to the Superfund area and also potential expansion areas B through I in Durham identified by F&O; includes fire service provided through a new 1,000,000 gallon storage tank at the "Middle Tank" location.

4. Service to Durham – North Tank: Service provided to the Superfund area and also potential expansion areas B through I in Durham identified by F&O; includes fire service provided through a new 1,000,000 gallon storage tank at the "North Tank" location.

5. Service to Durham – Middletown Interconnection: Service provided to the Superfund area and also potential expansion areas B through I in Durham identified by F&O; main and facilities sized to also provide up to 3 mgd to Middletown; includes fire service provided through a new 1,265,000 gallon storage tank at the "Middle Tank" location.

Costs

A detailed cost estimate for each of the five alternatives noted above is attached to this memorandum as Table 1. Costs were developed using information from the F&O report and hydraulic modeling. Costs for the transmission main were based on a per linear foot cost developed by the Construction Department, while costs for other facilities were based on past SCCRWA experience. The transmission main estimate includes the cost of anticipated milling and paving work on Route 17. Water main estimates include the cost of any engineering work. As shown on Table 1, 15% additional for engineering and 25% contingency have been added to the cost estimates for the pumping station and storage tanks in order to match the costs developed by F&O. Similarly, in order to match the work included by F&O in their cost estimates, SCCRWA's cost estimates include the work to connect all customers in the Superfund area to the new water mains, but do not include the cost of service connections in the other potential service areas of Durham. SCCRWA could provide service to the Superfund site for a cost of $13.7 million. SCCRWA could supply all of the areas identified by F&O within the town of Durham at a total cost of $19.7 million.

List of Attachments

The following supporting information is attached to this letter:

- Map of Proposed Route
- Map of Proposed Durham Service Areas (F&O)
- 2011 Construction Department Main Estimate
- RWA Cost Estimates: Tables 1 and 2

We look forward to working with CTDPH and the other stakeholders on this project in order to provide areas in Durham with a safe and reliable supply of drinking water. Should the SCCRWA options not prove viable, we remain willing to assist with the process if you feel we can bring value to it.

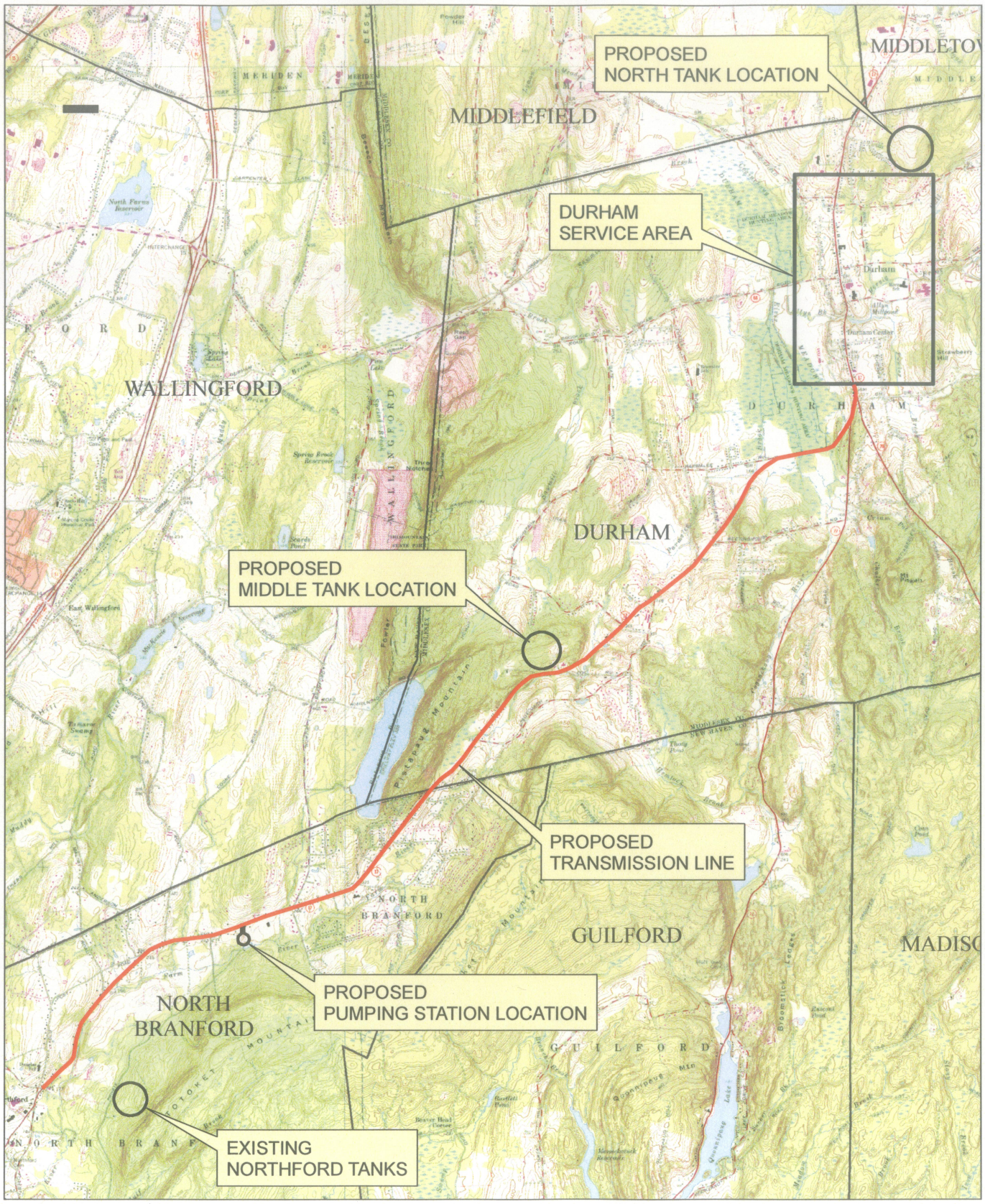
Very truly yours,

REGIONAL WATER AUTHORITY

Edward O. Norris, III, P.E.
Vice President – Operations & Engineering

cc: L. Bingaman, Regional Water Authority
S. Rupar, Regional Water Authority

TN/lg



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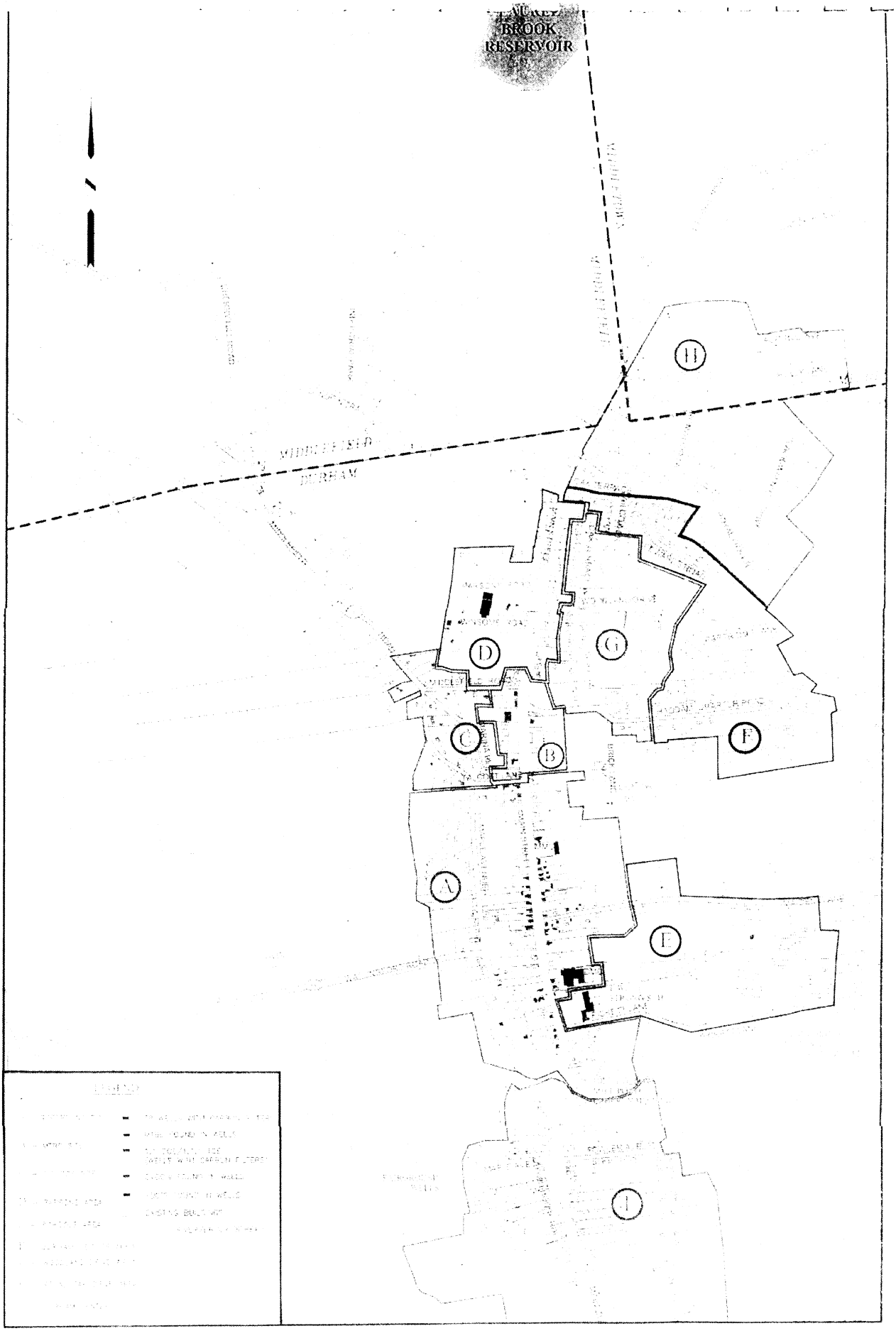
Miles

PROPOSED TRANSMISSION MAIN EXTENSION
NORTH BRANFORD & DURHAM, CONNECTICUT

Regional Water Authority


BROOK
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REGIONAL WATER AUTHORITY
ESTIMATED PROJECT COST

STREET NAME: Middletown Avenue **TOWN** North Branford **ESTIMATE NO:** GJ973A

PROJECT NAME: **INQUIRY NO** 09028

APPLICANT: Fuss & O'Neill Inc. **CONTACT:** Kevin Flood

146 Hartford Road

Manchester CT 06040 **PHONE:** (860) 646-2469

DESCRIPTION OF WORK: Extend 16" water main 19500' north on Middletown Avenue from existing 16" water main to proposed 16" main on the North Branford/ Durham town line

NUMBER OF FEET OF PIPE:	19500	16" @ 16" cost @	$117.78	$2,296,710.00
ROCK BLASTING:		linear feet @		$0.00
		Test Drilling		$0.00
PAVEMENT REPLACEMENT:	19500	square yards @	$50.00	$975,000.00
CURBING REPLACEMENT:		linear feet @		$0.00
		Milling Paving		$568,750.00
			Total:	**$3,840,460.00**

Remarks: Rock drilling, blasting and mechanical removal at extra cost. Frost removal at extra cost
Revised 5/2/11

Estimatedby George Jerolman Date 5/2/2011

Approved By [signature] Date 5/2/11

REGIONAL WATER AUTHORITY
ESTIMATED PROJECT COST

STREET NAME: Middletown Avenue **TOWN** Durham **ESTIMATE NO:** GJ974A

PROJECT NAME: **INQUIRY NO** 09028

APPLICANT: Fuss & O'Neill Inc. **CONTACT:** Kevin Flood

146 Hartford Road

Manchester CT 06040 **PHONE:** (860) 646-2469

DESCRIPTION OF WORK: Extend 16" water main 24500' north on Middletown Avenue from proposed 16" main @ the North Branford town line to blow off end

NUMBER OF FEET OF PIPE:	24500	16" @ 16" cost @	$118.43	$2,901,535.00
ROCK BLASTING:		linear feet @		$0.00
		Test Drilling		$0.00
PAVEMENT REPLACEMENT:	24500	square yards @	$50.00	$1,225,000.00
CURBING REPLACEMENT:		linear feet @		$0.00
		Milling Paving		$726,215.00
			Total:	**$4,852,750.00**

Remarks: Rock drilling, blasting and mechanical removal at extra cost. Frost removal at extra cost
Revised 5/2/11

Estimatedby: George Jerolman Date 5/2/2011

Approved By Thomas Hall Date: 5/2/2011

REGIONAL WATER AUTHORITY
ESTIMATED PROJECT COST

STREET NAME: Middletown Avenue **TOWN** North Branford **ESTIMATE NO:** GJ973B

PROJECT NAME: **INQUIRY NO** 09028

APPLICANT: Fuss & O'Neill Inc. **CONTACT:** Kevin Flood

146 Hartford Road

Manchester CT 06040- **PHONE:** (860) 646 2469

DESCRIPTION OF WORK: Extend 20" water main 19500' north on Middletown Avenue from existing 16" water main to proposed 20" main on the North Branford/ Durham town line.

NUMBER OF FEET OF PIPE:	19500	20" @ 20" cost @	$132.26	$2,579,070.00
ROCK BLASTING:		linear feet @		$0.00
		Test Drilling		$0.00
PAVEMENT REPLACEMENT:	19500	square yards @	$50.00	$975,000.00
CURBING REPLACEMENT:		linear feet @		$0.00
		Milling Paving		$568,750.00
			Total:	**$4,122,820.00**

Remarks: Rock drilling, blasting and mechanical removal at extra cost. Frost removal at extra cost

Estimatedby: George Jerolman Date: 5/2/2011

Approved By: Thomas McCann Date: 5/2/11

REGIONAL WATER AUTHORITY

ESTIMATED PROJECT COST

STREET NAME: Middletown Avenue **TOWN** Durham **ESTIMATE NO:** GJ974B

PROJECT NAME: **INQUIRY NO** 09028

APPLICANT: Fuss & O'Neill Inc. **CONTACT:** Kevin Flood

146 Hartford Road

Manchester CT 06040- **PHONE:** (860) 646 2469

DESCRIPTION OF WORK: Extend 20" water main 24500' north on Middletown Avenue from proposed 20" main @ the North Branford town line to blow off end.

NUMBER OF FEET OF PIPE:	24500	20" @ 20" cost @	$133.73	$3,276,385.00
ROCK BLASTING:		linear feet @		$0.00
		Test Drilling		$0.00
PAVEMENT REPLACEMENT:	24500	square yards @	$50.00	$1,225,000.00
CURBING REPLACEMENT:		linear feet @		$0.00
		Milling .Paving		$726,215.00
			Total:	**$5,227,600.00**

Remarks: Rock drilling, blasting and mechanical removal at extra cost. Frost removal at extra cost

Estimatedby: George Jerolman Date: 5/2/2011

Approved By: Date

Table 1
Estimate to Provide Water Service to Durham
Prepared April 27, 2011

Item	Unit	Unit Price	Superfund Only Fire Pump		Superfund Only Middle Tank		Service to Durham Middle Tank		Service to Durham North Tank		Service to Durham Middletown Interconnection	
			Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Area A - Superfund Site												
8-inch Main	LF	$ 152	5,950	$ 904,400	5,950	$ 904,400	5,950	$ 904,400	5,950	$ 904,400	5,950	$ 904,400
12-inch Main	LF	$ 155	1,100	$ 170,500	1,100	$ 170,500	1,100	$ 170,500	1,100	$ 170,500	1,100	$ 170,500
16-inch Main	LF	$ 198	0	$ -	6,450	$ 1,277,100	6,450	$ 1,277,100	6,450	$ 1,277,100	0	$ -
20-inch Main	LF	$ 213	6,450	$ 1,373,850	0	$ -	0	$ -	0	$ -	6,450	$ 1,373,850
Abandon Wells	Each	$ 2,000	100	$ 200,000	100	$ 200,000	100	$ 200,000	100	$ 200,000	100	$ 200,000
Remove Filtration Systems	Each	$ 500	38	$ 19,000	38	$ 19,000	38	$ 19,000	38	$ 19,000	38	$ 19,000
Service Connections (main to meter vault)	Each	$ 4,000	100	$ 400,000	100	$ 400,000	100	$ 400,000	100	$ 400,000	100	$ 400,000
Service to House (meter vault to house)	Each	$ 2,500	100	$ 250,000	100	$ 250,000	100	$ 250,000	100	$ 250,000	100	$ 250,000
Sub-Total				**$ 3,317,750**		**$ 3,221,000**		**$ 3,221,000**		**$ 3,221,000**		**$ 3,317,750**
Area B - MTBE Site												
8-inch Main	LF	$ 152	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	1,350	$ 267,300	1,350	$ 267,300	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	1,350	$ 287,550
Sub-Total				**$ -**		**$ -**		**$ 267,300**		**$ 267,300**		**$ 287,550**
Area C - 1,1 DCE Site												
8-inch Main	LF	$ 152	0	$ -	0	$ -	2,800	$ 425,600	2,800	$ 425,600	2,800	$ 425,600
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Sub-Total				**$ -**		**$ -**		**$ 425,600**		**$ 425,600**		**$ 425,600**
Area D - Parsons Area												
8-inch Main	LF	$ 152	0	$ -	0	$ -	1,550	$ 235,600	1,550	$ 235,600	1,550	$ 235,600
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	2,100	$ 415,800	2,100	$ 415,800	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	2,100	$ 447,300
Sub-Total				**$ -**		**$ -**		**$ 651,400**		**$ 651,400**		**$ 682,900**
Area E - Schools Area												
8-inch Main	LF	$ 152	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
12-inch Main	LF	$ 155	0	$ -	0	$ -	5,250	$ 813,750	5,250	$ 813,750	5,250	$ 813,750
16-inch Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Sub-Total				**$ -**		**$ -**		**$ 813,750**		**$ 813,750**		**$ 813,750**
Area F - Durham Heights Area												
8-inch Main	LF	$ 152	0	$ -	0	$ -	6,350	$ 965,200	6,350	$ 965,200	6,350	$ 965,200
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Sub-Total				**$ -**		**$ -**		**$ 965,200**		**$ 965,200**		**$ 965,200**

Table 1
Estimate to Provide Water Service to Durham
Prepared April 27, 2011

Item	Unit	Unit Price	Superfund Only Fire Pump		Superfund Only Middle Tank		Service to Durham Middle Tank		Service to Durham North Tank		Service to Durham Middletown Interconnection	
			Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Area G - Woodland Drive Area												
8-inch Main	LF	$ 152	0	$ -	0	$ -	4,550	$ 691,600	4,550	$ 691,600	4,550	$ 691,600
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Sub-Total				**$ -**		**$ -**		**$ 691,600**		**$ 691,600**		**$ 691,600**
Area H - Royal Oak Drive Area -*Not Included serves Middletown*												
8-inch Main	LF	$ 152	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Sub-Total				**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
Area I - Durham Center												
8-inch Main	LF	$ 152	0	$ -	0	$ -	3,900	$ 592,800	3,900	$ 592,800	3,900	$ 592,800
12-inch Main	LF	$ 155	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-inch Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
20-inch Main	LF	$ 213	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Sub-Total				**$ -**		**$ -**		**$ 592,800**		**$ 592,800**		**$ 592,800**
Transmission Main from SCCRWA to Durham												
16-inch Main	LF	$ 198	22,500	$ 4,455,000	43,000	$ 8,514,000	27,000	$ 5,346,000	43,000	$ 8,514,000	0	$ -
20-inch Main	LF	$ 213	20,500	$ 4,366,500	0	$ -	16,000	$ 3,408,000	0	$ -	47,100	$ 10,032,300
Env. Impact Evaluation	LS	$ 100,000	1	$ 100,000	1	$ 100,000	1	$ 100,000	1	$ 100,000	1	$ 100,000
Sub-Total				**$ 8,921,500**		**$ 8,614,000**		**$ 8,854,000**		**$ 8,614,000**		**$ 10,132,300**
Middle Storage Tank												
Land	LS	$ 200,000	0	$ -	1	$ 200,000	1	$ 200,000	0	$ -	1	$ 200,000
1.0 MG Tank	LS	$ 1,265,000	0	$ -	0	$ -	1	$ 1,265,000	0	$ -	1	$ 1,265,000
0.75 MG Tank	LS	$ 948,750	0	$ -	1	$ 948,750	0	$ -	0	$ -	0	$ -
16-Inch Approach Main	LF	$ 198	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
16-Inch Approach Main (no paving)	LF	$ 118	0	$ -	1,300	$ 153,400	1,300	$ 153,400	0	$ -	1,300	$ 153,400
Engineering 15% + 25% Contingency	%	40%		$ -		$ 520,860		$ 647,360		$ -		$ 647,360
Sub-Total				**$ -**		**$ 1,823,010**		**$ 2,265,760**		**$ -**		**$ 2,265,760**
North Storage Tank												
Land	LS	$ 200,000	0	$ -	0	$ -	0	$ -	1	$ 200,000		$ -
1.0 MG Tank	LS	$ 1,265,000	0	$ -	0	$ -	0	$ -	1	$ 1,265,000		$ -
16-Inch Approach Main (no paving)	LF	$ 80	0	$ -	0	$ -	0	$ -	4,350	$ 348,000		$ -
Engineering 15% + 25% Contingency	%	40%		$ -		$ -		$ -		$ 271,950		$ -
Sub-Total				**$ -**		**$ -**		**$ -**		**$ 2,084,950**		**$ -**
Pumping Station												
Land	LS	$ -	1	$ -	1	$ -	1	$ -	1	$ -	1	$ -
Pumping Station	LS	$ 800,000	1	$ 800,000	1	$ 800,000	1	$ 800,000	1	$ 800,000	1	$ 800,000
16-inch Suct/Disch Main (no Paving)	LF	$ 118	1,500	$ 177,000	1,500	$ 177,000	1,500	$ 177,000	1,500	$ 177,000	1,500	$ 177,000
Fire Pump	LS	$ 75,000	1	$ 75,000		$ -	0	$ -	0	$ -	0	$ -
Modification to Clintonville PS	LS	$ 150,000		$ -		$ -	0	$ -	0	$ -	1	$ 150,000
Engineering 15% + 25% Contingency	%	40%		$ 420,800		$ 390,800		$ 390,800		$ 390,800		$ 450,800
Sub-Total				**$ 1,472,800**		**$ 1,367,800**		**$ 1,367,800**		**$ 1,367,800**		**$ 1,577,800**
SCCRWA TOTAL				**$ 13,712,050**		**$ 15,025,810**		**$ 20,116,210**		**$ 19,695,400**		**$ 21,753,010**
Middletown Water TOTAL				$ 12,120,000		$ 12,120,000				$ 27,150,000		$ 27,150,000

Table - 2
Miscellaneous Calculations

Estimated Pipe Costs	
Size (inch)	**Cost (LF)**
8	$ 152.00
10	$ 154.00
12	$ 155.00
16	$ 198.00
20	$ 213.00

Services

From Main to Meter Vault (inc meter):	$ 4,000.00
Service line from vault to building:	$ 2,500.00
Total:	$ 6,500.00

Appendix E

The State Historic Preservation Office (SHPO) Response Letter

Connecticut Commission on Culture & Tourism

Historic Preservation
and Museum Division

[illegible]
Hartford, [illegible]
06103

[illegible]
860.256.[illegible]

January 16, 2009

Mr. Tereshteh Doost
Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040-5921

Subject: Water Main Construction
Durham, CT

Dear Mr. Doost:

The State Historic Preservation Office has reviewed the above-named project. This office notes that the project area possesses moderate to high sensitivity for prehistoric and historic archaeological resources. Therefore, we recommend that a professional assessment survey be undertaken to identify and evaluate archaeological resources which may exist within proposed project limits, including, equipment storage and associated work areas. All archaeological studies must be undertaken in accordance with our *Environmental Review Primer for Connecticut's Archaeological Resources*. A list of archaeological consultants is attached for your information.

No ground disturbance or construction-related activities should be initiated until this office has had an opportunity to review and comment upon the recommended archaeological survey report.

We anticipate working with all interested parties in the expeditious furtherance of the proposed undertaking as well as in the professional management of Connecticut's archaeological heritage.

For further information please contact Dr. David A. Poirier, Staff Archaeologist.

Sincerely,

David Bahlman

David Bahlman
Deputy State Historic Preservation Officer

cc: Dr. Nicholas Bellantoni OSA

CONNECT

Connecticut Commission on Culture & Tourism

Historic Preservation
and Museum Division

One Constitution Plaza
Second Floor
Hartford, Connecticut
06103

860 256-2800
860 256-2763 (f)

TO WHOM IT MAY CONCERN

The following archaeologists, as known to us, meet the professional qualification guidelines of the National Park Service:

ACS [Archaeological Consulting Services]
Attn: Dr. Gregory Walwer
10 Stonewall Lane
Guilford, CT 06437-2949
Phone: 203-458-0550
Fax: 203-458-0550

American Cultural Specialists
Attn: Dr. Lucianne Lavin
108 New Street
Seymour, CT 06483
Phone: 203-888-8897
Fax: 801-729-5961

Archaeological & Historical Services
Attn: Ms. Mary Harper
PO Box 543
Storrs, CT 06268
Phone: 860-429-2142
Fax: 860-429-9454

Archaeological Services
Attn: Dr. Mitchell Mulholland
The Environmental Institute
Blaisdell House
University of Massachusetts
Amherst, MA 01003
Phone: 413-545-1626
Fax: 413-545-2304

Archaeology Research Center
Attn: Mr. William C. Crandall
University of Maine at Farmington
139 Quebec Street
Farmington, ME 04938
Phone: 207-778-7012
Fax: 207-778-7024

CONNECT

Marc L. Banks, Ph.D., LLC
111 Lincoln Lane
Weatogue, CT 06089
Phone: 860-658-7482
Fax: 860-217-7402

Louis Berger Group Inc.
Attn: Ms. Hope Luhman, Cultural Resources
20 Corporate Woods Boulevard
Albany, NY 12211
Phone: 518-432-9545
Fax: 518-432-9571

BL Companies
Attn: Mr. James R. Kodlick
355 Research Parkway
Meriden, CT 06450
Phone: 717-651-9850
Fax: 717-651-9858

Gray & Pape Inc.
Attn: Mr. Raymond D. Pasquariello
60 Valley Street, Suite 103
Providence, RI 02909
Phone: 401-273-9900
Fax: 401-273-9944

Hartgen Archaeological Associates Inc.
Attn: Ms. Karen S. Hartgen
524 Broadway
Albany, NY 12207
Phone: 518-427-0382
Fax: 518-427-0384

Heritage Consultants LLC
Attn: Mr. David R. George
877 Main Street
Newington, CT 06111
Phone: 860-667-3001
Fax: 860-667-3008

Historical Perspectives Inc.
Attn: Ms. Cece Saunders
PO Box 3037
Westport, CT 06880-9998
Phone: 203-226-7654
Fax: 203-226-8376

John Milner Associates Inc.
Attn: Mr. James A. Chiarelli
410 Great Pond Road, Suite B-14
Littleton, MA 01460
Phone: 978-486-0688
Fax: 978-486-3470

Public Archaeology Laboratory Inc.
Attn: Ms. Deborah Cox
210 Lonsdale Avenue
Pawtucket, RI 02860
Phone: 401-728-8780
Fax: 401-728-8784

Public Archaeology Survey Team Inc.
Attn: Ms. Mary Harper
PO Box 209
Storrs, CT 06268
Phone: 860-429-1723
Fax: 860-429-1724

Raber Associates
Attn: Dr. Michael S. Raber
81 Dayton Road, PO Box 46
South Glastonbury, CT 06073
Phone: 860-633-9026
Fax: 860-633-9026

TRC Solutions
Attn: Dr. Peter Pagoulatos
850 Bear Tavern Road, Suite 104
Trenton, NJ 08628
Phone: 609-882-7704, ext. 108

Mr. Ernest Wiegand
152 Silver Spring Road
Wilton, CT 06897
Phone: 203-733-5184

This information updates and supersedes all previous material provided by the State Historic Preservation Office with respect to the identification of archaeological consultants. Further, this list has been arranged alphabetically; no preferential rating or evaluation should be inferred. The State Historic Preservation Office does not recommend, endorse, or assume responsibility for the quality of work for any individual or firm on this list, nor is there any guarantee, implicit or implied, that any work product produced by those on this list will necessarily meet federal and state requirements.

At its discretion, the State Historic Preservation Office may remove consultants from its informational list if no work has been undertaken in Connecticut over a three year period.

For further information please contact Dr. David A. Poirier, Staff Archaeologist.

Revised 1/09

FUSS & O'NEILL
Disciplines to Deliver

COPY

January 13, 2009

Mr. David Poirier
State Historic Preservation Officer
Connecticut Commission on Culture & Tourism
Historic Preservation and Museum Division
One Constitution Plaza, 2nd Floor
Hartford, Connecticut 06103

RE: Site Review for Water Main Construction in Durham, CT

Dear Mr. Poirier:

Several water quality issues and the need for improved fire protection has prompted the Town of Durham to consider the extension of public water supply into the center of Town. An existing privately owned water system near Durham center reportedly does not have the capacity and facilities to address both contaminated groundwater and fire protection needs for the Town of Durham. The City of Middletown currently has capacity available in their municipal system, and City representatives have indicated they are prepared to assist the Town in addressing public health and safety needs for the community.

As part of this study, Fuss & O'Neill is interested in coordination with the CT State Historic Preservation Officer for future permitting issues. Please review this project location (attached) for information on the location and existence of historic resources and report any findings to us.

Sincerely,

Fereshteh Doost

Fereshteh Doost, P.E.
Senior Project Engineer

/lhp

Attachment

146 Hartford Road
Manchester, CT
06040-5921

t (860) 646-2469
(800) 286-2469
f (860) 533-5143

www.FandO.com

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Copies (HO)

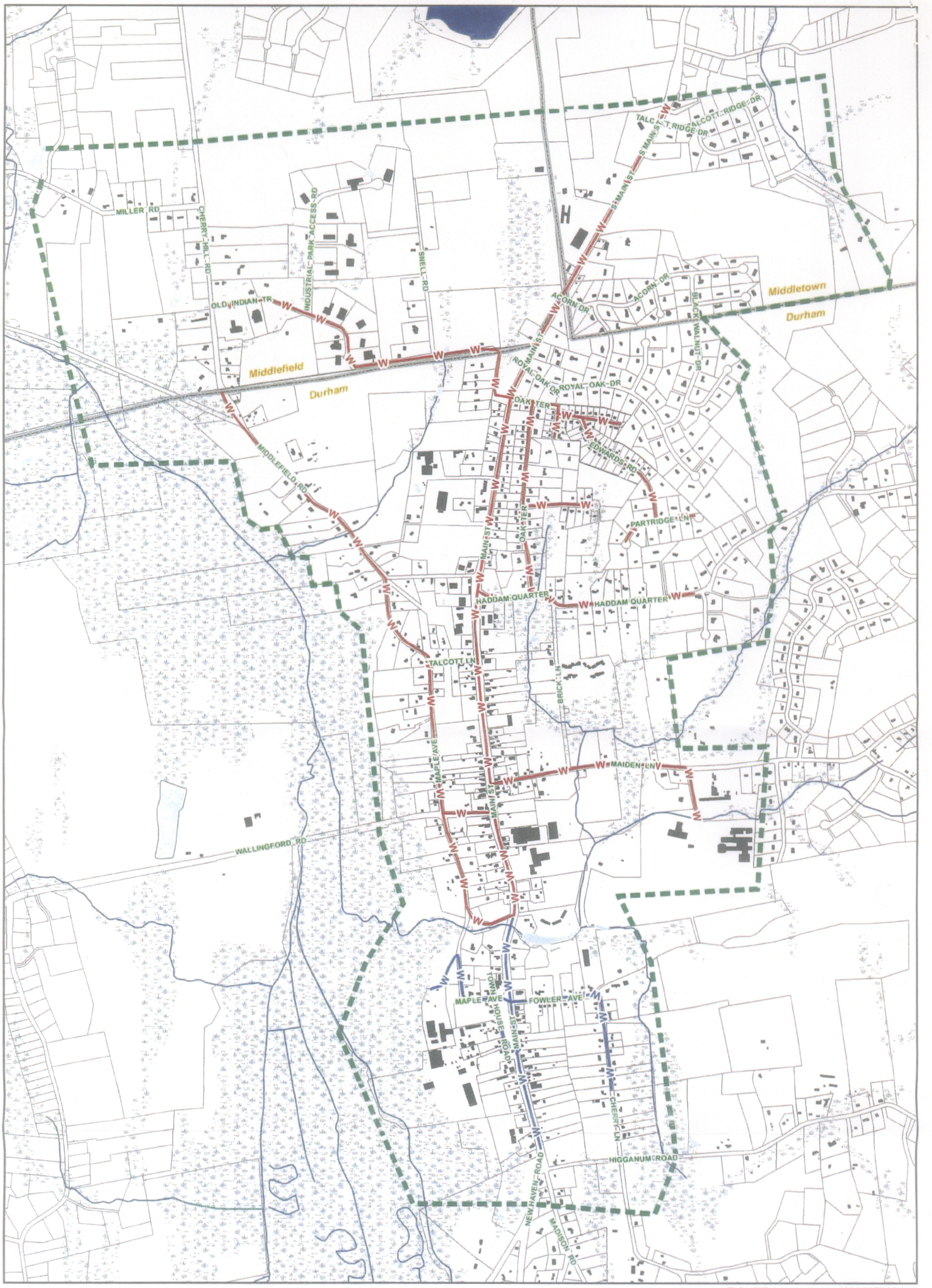

FIGURE 1 JANUARY 2009

Water
Wetlands
Water
Marsh Connector
Surface Water Reservoir

General Study Area
Existing Water Main
Proposed Water Main

N
W E
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PROJECT LOCATION
WATER SYSTEM EXTENSION FEASIBILITY STUDY
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

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Appendix F

The Natural Diversity Database (NDDB) Response Letters

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WILDLIFE DIVISION

SESSIONS WOODS WILDLIFE MANAGEMENT AREA
P.O. BOX 1550 • BURLINGTON, CT 06013 - 1550
TELEPHONE (860) 675-8130 • FAX (860) 675-8141

March 12, 2009

Fereschteh Doost
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Re: Water main extension in Middletown and Durham, Connecticut

Dear Fereshteh,

Materials pertaining to the above project were forwarded to me for review by the DEP Natural Diversity Database (NDDB). The NDDB indicated that the state species of special concern wood turtle (*Glyptemys insculpta*) occurs in the upland area of this proposed project.

Given that construction is slated to occur within Main Street (Route 17), it is unlikely that this proposed project will impact wood turtles or the other state-listed species noted by Ms. McKay (DEP-NDDB) which occur within the Durham Meadows wetland complex. Proper sedimentation and erosion controls should be used near wetlands/watercourses and adjacent storm drains. This practice should be maintained throughout the course of the project.

The Wildlife Division has not made an on-site inspection of the project area. Consultation with this office should not be substituted for site-specific surveys that may be required for environmental assessments. This is a preliminary site review and is not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to the DEP for the proposed site. Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested and species-specific surveys may be required. If the proposed project has not been initiated within six months of this Wildlife Division review, you should contact the NDDB for an updated review.

If you have additional questions regarding wood turtles, contact Julie Victoria (DEP Wildlife Division: Franklin WMA, 391 Route 32, North Franklin, CT 06254). If you additional questions regarding the state-listed species found within Durham Meadows wetland complex, please feel free to contact me.

Sincerely,

Jenny Dickson
Wildlife Biologist

JD/ls
cc: D. McKay -16647
J. Victoria

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Natural Resources
Wildlife Division
79 Elm Street, 6th Floor
Hartford, CT 06106
Natural Diversity Data Base

February 18, 2009

Fereshteh Doost
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

re: Durham Water Main Extension Study
in Middletown and Durham, Connecticut

Dear Fereshteh Doost:

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed study of a water main extension within Main Street (Rte. 17) from Middletown into Durham, Connecticut. According to our information there are records for many state-listed animal species from this area of the Durham, especially in the area of Durham Meadows. The only state-listed species on this list that is not associated with Durham Meadows is State Special Concern *Glyptemys insculpta* (wood turtle). I have attached a list of these species for your files and have sent your letter to Jenny Dickson (DEP-Wildlife; 860-675-8130) for further review. Ms. Dickson will write to you directly with her comments.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at 424-3592. Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Sincerely,

Dawn M. McKay
Biologist/Environmental Analyst

Cc: Jenny Dickson, NDDB # 16647

Species List for Request Number R16647

2/18/2009

Scientific Name	Common Name	State Protection Status
Animals		
Anas discors	Blue-winged Teal	T
Botaurus lentiginosus	American Bittern	E
Clemmys insculpta	Wood Turtle	SC
Dolichonyx oryzivorus	Bobolink	SC
Empidonax alnorum	Alder Flycatcher	SC
Ixobrychus exilis	Least Bittern	T
Lycaena hyllus	Bronze Copper	SC
Rallus elegans	King Rail	E
Rana pipiens	Northern Leopard Frog	SC

E = Endangered, T = Threatened, SC = Special Concern, SC* = Special Concern, Presumed Extirpated

FUSS & O'NEILL
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COPY

☒146 Hartford Road, Manchester, CT 06040
TEL: (860) 646-2469 FAX: (860) 533-5143

☐78 Interstate Drive, West Springfield, MA 01089
TEL: (413) 452-0445 FAX: (413) 846-0497

☐275 Promenade Street, Suite 350, Providence, RI 02908
TEL: (401) 861-3070 FAX: (401) 861-3076

☐56 Quarry Road, Trumbull, CT 06611
TEL: (203) 374-3748 FAX: (203) 374-4391

☐610 Lynndale Court, Suite E, Greenville, NC 27858
TEL: (252) 355-1370 FAX: (252) 355-8186

☐462 Dorothy Drive, King of Prussia, PA 19406
TEL: (610) 337-2450 FAX: (610) 337-2155

☐1419 Richland Street, Columbia, SC 29201
TEL: (803) 376-6034 FAX: (803) 376-6035

☐24 Madison Avenue Extension, Albany, NY 12203
TEL: (518) 218-0600 FAX: (518) 518-0606

☐80 Washington Street, Suite 301, Poughkeepsie, NY 12601
TEL: (800) 394-8081 FAX: (845) 452-5186

Letter of Transmittal

To:	Wildlife Division	Date:	December 30, 2008
	Bureau of Natural Resources	Project No:	1998.823.B20
	Department of Environmental Protection	Re:	Water Main Extension Feasibility Study
	79 Elm Street, 6th Floor		NDDB Detailed Review
	Hartford, CT 06106-5127	Telephone No:	

We are sending you: ☒ Attached ☐ Under Separate Cover ☐ via Certified Mail

☐ Shop Drawings ☐ Prints ☒ Plans ☐ Specifications
☒ Copy of Letter ☐ Change Order ☐ Reports ☒ Other

Copies	Date	No.	Description
1	12/30/2008	2 Pages	Connecticut Natural Diversity Database Review Request Form
1	12/30/2008	1 Pages	8.5x11 USGS Project Location Map with Preliminary NDDB Mapping
1	10/23/2008	1 Sheet	11x17 Recommended Water Main Extension

☒ For approval ☐ Returned loaned prints ☐ Furnish as submitted
☐ As requested ☐ Return signed original ☐ Furnish as noted
☒ For your use ☐ For bids due ☐ Rejected
☒ For review & comment ☐ Submit _____ copies for distribution ☐ Resubmit _____ copies for approval

Please review the following material for any potential conflicts and impacts on listed species or significant natural communities.

C: **Permitting File Folder**

Signed: Fereshteh Doost, PE

Connecticut Natural Diversity Data Base Review Request Form

Please complete this form *only* if you have conducted a review which determined that your activity is located in an area of concern.

Name: **Fuss & O'Neill, Inc**

Affiliation: **Consulting Engineer**

Mailing Address: **146 Hartford Road**

City/Town: **Manchester** State: **CT** Zip Code: **06040**

Business Phone: **860-646-2469** ext. **5295** Fax: **860-533-5143**

Contact Person: **Fereshteh Doost** Title: **Senior Project Engineer**

Project or Site Name: **Durham, CT Water Main Extension**

Project Location **Main Street** Town: **Durham** USGS Quad: **Durham (#82)**

Brief Description of Proposed Activities: Middletown (#67)

Public water system will be extended south from Middletown within Main Street (Route 17) to provide potable water for existing and potential properties with contaminated groundwater in the center portion of Durham and southeast portion of Middletown. Water extension may also provide fire protection for the Town of Durham. Impacts will be primarily construction related and temporary, since the infrastructure improvements will be below grade in the existing roads.

Have you conducted a "State and Federal Listed Species and Natural Communities Map" review?

☒ Yes ☐ No Date of Map: **December 2008**

Has a field survey been previously conducted to determine the presence of any endangered, threatened or special concern species? ☐ Yes ☒ No

If yes, provide the following information and submit a copy of the field survey with this form.

Biologists Name:

Address:

If the project will require a permit, list type of permit, agency and date or proposed date of application:

DEP Storm water Permit (from Construction Activities)	**2009 / 2010**
DOT Encroachment Permit	**2009 / 2010**

(See reverse side - you must sign the certification on the reverse side of this form)

The Connecticut Natural Diversity Data Base (CT NDDB) information will be used for:

permit application

☐ environmental assessment (give reasons for assessment):

☒ other (specify):

Environmental Impact Evaluation (EIE)

"I certify that the information supplied on this form is complete and accurate, and that any material supplied by the CT NDDB will not be published without prior permission."

Kenneth Dodd — Signature

12/30/08 — Date

All requests must include a USGS topographic map with the project boundary clearly delineated.

Return completed form to:

WILDLIFE DIVISION
BUREAU OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM ST, 6TH FLOOR
HARTFORD, CT 06106-5127

* You must submit a copy of this completed form with your registration or permit application.

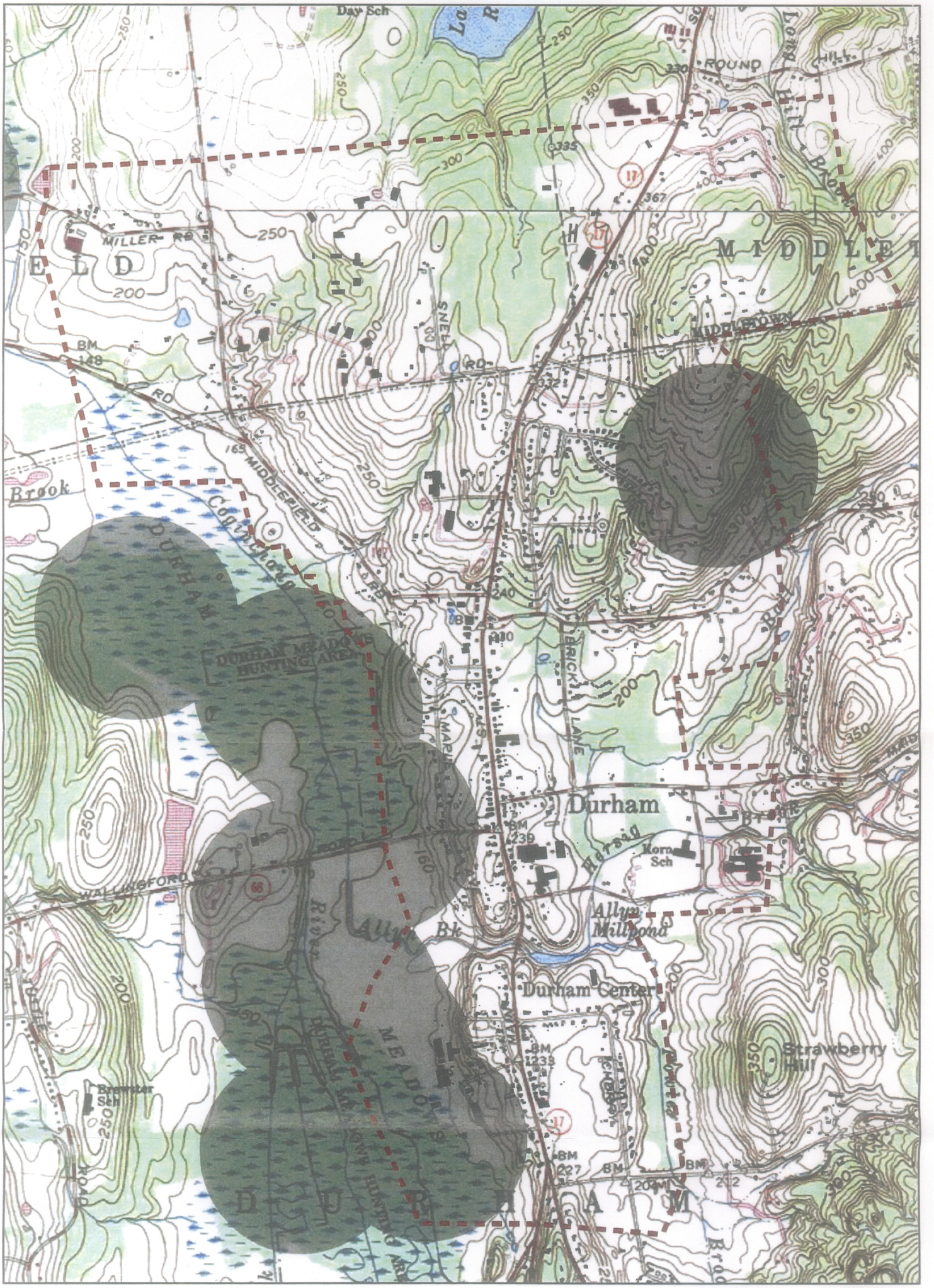

FIGURE 2 JANUARY 2008

General Study Area

Natural Diversity Database Area

NATURAL DIVERSITY DATABASE
WATER SYSTEM EXTENSION FEASIBILITY STUDY
TOWN OF DURHAM

0 500 1,000 2,000 Feet

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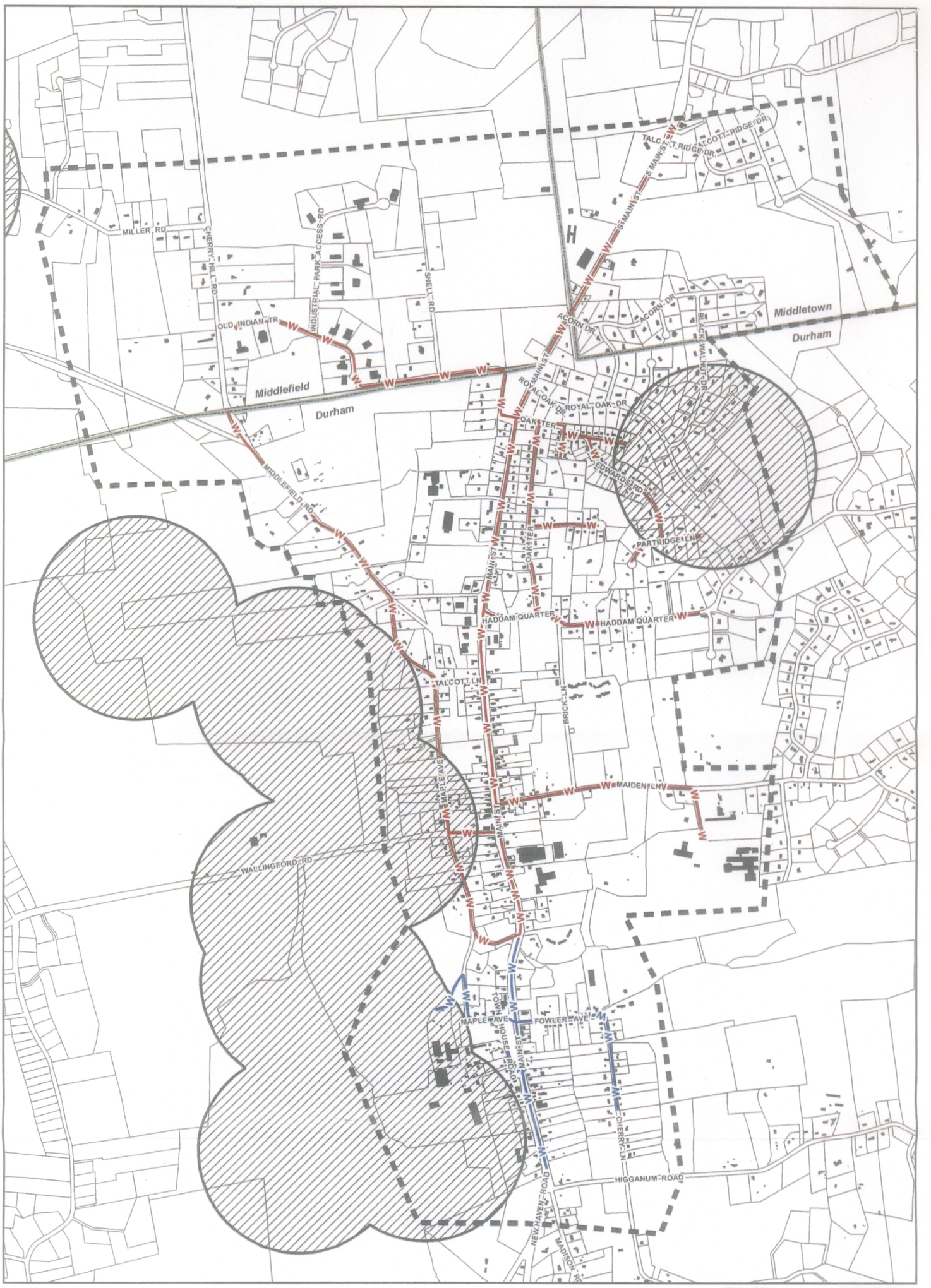

FIGURE 1 JANUARY 2008

General Study Area

Natural Diversity Database Area

Existing Water Main

Proposed Water Main

0 500 1,000 2,000 Feet

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NATURAL DIVERSITY DATABASE
WATER SYSTEM EXTENSION FEASIBILITY STUDY
TOWN OF DURHAM

FUSS & O'NEILL
Disciplines to Deliver

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Appendix G

Excerpts from Middletown's Planning and Zoning Code

CITY OF MIDDLETOWN, CONNECTICUT
Department of Planning, Conservation and Development
245 DeKoven Drive, Suite 202, Middletown, Connecticut, 06457
(PH) 860-344-3425 (FX) 860-344-3593
William Warner, AICP Department Director

Home
News
Plan of Development
Zoning Code
GIS Mapping
Middletown Statistics
Calendar
Permits
Regulations
Initiatives & Projects
Common Questions
For Residences
For Businesses
Boards and Commissions
Application Review
Citizen's Advisory
Conservation
Design Review & Preserv.
Economic Development
Planning & Zoning
Redevelopment Agency
Wetlands and Watercourses
Zoning Board of Appeals
Divisions
CommunityDevelopment
Economic Development
Environment
Planning and Zoning
Zoning Enforcement
Site Map
Contact Us

Planning and Zoning Code- Section 61

Online version is NOT official, it is only for use as a reference.
Official copies can be viewed or purchased at the
Department of Planning, Conservation, and Development.

Return to Zoning Code- Table of Contents

SECTION 61- BUSINESS ZONES, INDUSTRIAL ZONES AND OTHER NON-RESIDENTIAL ZONES USES SCHEDULE-

61.00- No land shall be used or occupied and no structure shall be erected, constructed, reconstructed, altered or used, except for any use of the following permitted uses, special exception uses, accessory uses, permitted home occupation uses or uses by temporary uses.

In any case where a use is alleged to be similar to a specified use referred to in the following schedule, its status shall be determined by the Commission by reference to the most clearly similar uses or uses that are specifically referred to in the use schedule or declare that the use is not similar. When the status of a use has been so determined, such determination shall thereafter have general applicability to all uses of the same type.

61.01- PERMITTED USES- The following uses may be operated as permitted uses:

- 61.01.01- Agriculture, including nurseries and farms, hydroponics farming.
  ZONES: I-1, I-2, I-3, IT
- 61.01.01A- Raising crops, nursery stock or trees.
  ZONE: I-4 (Added effective 11/10/88)
- 61.01.02- Animal hospitals, veterinary clinics, etc. Animal hospitals, kennels, display and housing and board of pets and other domestic animals, provided that any enclosures or buildings in which animals are kept shall be at least two hundred (200) feet from any residential zone, and at least one hundred (100) feet from any B-1 zone, and exercise runs shall be enclosed on four (4) sides by a sight-obscuring unpierced fence or wall at least five (5) feet in height.
  ZONE: I-1
- 61.01.03- Automobile, truck, repair garages to provide services such as rebuilding, body and paint work, overhauling, tire retreading or recapping, but not to include commercial wrecking, dismantling or junk yards- all parking and storage areas shall be paved with concrete, asphalt or comparable hard surface.
  ZONE: I-1
- 61.01.04- Automobile services, farm implements--automobile, truck trailers, farm implements, for sale, display, hire or repair, including sales lots, used car lots, trailer lots, repair garages, body and fender shops, paint shops, but not within fifty (50) feet from any residential zone.
  ZONE: I-1
- 61.01.05- Banks--savings and loan companies, finance companies and similar services.
  ZONES: B1, B2, TD*, NPC (Added effective 1/15/99)

- 61.01.06- Blacksmith shop, welding or other metal working shop and machine shops.
  ZONES: I-1, I-2, IT, IRA (Revised 8/1/86), NPC (Added effective 1/15/99)
- 61.01.07- Building and related trades--including carpenter shops, electrical, plumbing, paint shops, heating shops, paper hanging shops, furniture upholstering and similar enterprises, but not within one hundred (100) feet from any residential zone. In the B-2 Zone no exterior storage shall be permitted.
  ZONES: B2, I-1, I-2, IRA (Revised 8/1/86), NPC (Added effective 1/15/99)
- 61.01.08- Commercial studies and art studios--including automobile driving schools, business colleges, trade schools, dancing studios, photographic studios, radio and telecasting studios.
  ZONES: B1, B2 (Revised 5/8/96), NPC (Added effective 1/15/99)
- 61.01.09- Commercial Parking Lots, need not be enclosed.
  ZONES: B1, B2
- 61.01.10- Contractor's yard and related establishments--including building material yards (excluding concrete mixing, contractor's equipment storage yard or plant); or storage yard for rental of equipment commonly used by contractors; trucking or motor freight stations or terminals; retail lumber yards, including incidental millwork; storage and sale of grain, livestock feed or fuel; carting, express or hauling establishments, including storage of vehicles; provided new uses are conducted either (1) wholly within a completely enclosed building or buildings, except for storage of vehicles, which building shall be distant at least one hundred (100) feet from any residential zone or (2) when conducted within an area completely enclosed on all sides with a solid wall or uniformly painted solid board fence not less than six(6) feet high, but not within two hundred (200) feet of any residential zone; provided further that all storage yards related to the uses in this paragraph shall be enclosed.
  ZONE: I-1
- 61.01.11- Eating and drinking establishments--including eating and drinking places, summer gardens, and roadhouses (Excluding drive-in restaurants); provided that such use is not within two hundred (200) feet of any residential zone.
  ZONES B2, TD*
- 61.01.12- Eating and drinking places--including soda fountains, ice cream parlors, tea rooms, private dining rooms and restaurants, banquet halls and clubs, subject to all applicable regulations and such permits and licenses as may be required by, but not including drive-in restaurants.
  ZONES: B1, B2, TD*
- 61.01.13- Dry Cleaning Establishments (Addition, Effective 3/115/85) ZONE: I-2, NPC (Added effective 1/15/99)
- 61.01.14- Entertainment--including theaters, radio and television studios, bowling alleys, assembly halls, or similar places of assembly or entertainment.

  ZONES: B1, B2
- 61.01.15- DELETED (Effective 8/15/94)
- 61.01.16- DELETED (Effective 2/14/96)
- 61.01.17- Hotels and Inns- but not including Motels. ZONES: B1, NPC (Added effective 1/15/99)
- 61.01.18- Laboratories--including experimental, photographic or testing laboratories, dental and medical, provided no operation shall be conducted or equipment used which would create hazards, noxious or offensive conditions.
  ZONES: I-1, I-2, I-3, IT, IRA, IOP (Revised effective 4/10/92) NPC (Added eff. 1/15/99)
- 61.01.19- Manufacturing- A use engaged in the basic processing and manufacturing of materials, parts or products from extracted or raw materials or from previously prepared materials, including processing, fabrication, assembly, treatment, packaging, and incidental storage, sales and distribution of such products.
  ZONES: I-1, I-2, I-3, TD*, IT, IRA, NPC (Section amended 3/30/99)
- 61.01.19A- Enterprises which perform the following activities with non-primary,

finished components or goods; manufacturing with all its integral functions, fabrication, assembly, testing, packaging, storage and distribution.
ZONE: I-4 (Added effective 11/10/88)

- 61.01.20- Mortuaries or funeral homes--including ambulance service.
ZONES: B1, B2, TD*
- 61.01.21- Newspaper and job printing.
ZONES B1, I-1, NPC (added effective 1/15/99)
- 61.01.22A- Non-commercial uses such as churches and other places of worship; libraries, museums, and similar institutions; private clubs or lodges. (Revised effective 4/15/94) ZONES: B1, B2, TD*, NPC (Added effective 3/15/02)
- 61.01.22B- Housing for the elderly or handicapped within 1,000 feet of public transportation and shopping; single family dwelling detached; two family dwelling; Urban Core Living Units. (Amended 7/15/85)
ZONES: B1, TD*
- 61.01.23- Professional and Business offices and office buildings--including general and professional tenants as well as banking, savings and loan and other financial institutions but not including medical or dental clinics or mental health/substance abuse treatment facilities, offices or clinics.
ZONES: B1, B2, TD* (Amended effective 5/1/97) NPC (added effective 1/15/99)
- 61.01.24- Printing and related trades--including publishing, job printing, lithographing; blueprinting, etc., but not within one hundred (100) feet of any residential zone.
ZONES: B2, I-1, I-2, I-3, TD* IT, IRA (Revised 8/1/86) NPC (Added eff. 1/15/99)
- 61.01.25- Public building--including post office; fire and police stations; bus passenger terminal, telephone exchange or office or other public utility office; and governmental buildings.
ZONES: B1, B2, TD*, NPC (Added effective 1/15/99)
- 61.01.26- Public utilities buildings and structures--including Storage yards and vehicle parking are.
ZONES: I-1, I-2, I-3, TD*, IRA (Revised 8/1/86)
- 61.01.27- Recreation (commercial)--including baseball field, swimming pools, skating rinks, golf driving ranges, stadiums or arenas and similar open air facilities; livery stables or riding academies, amusement parks, or similar recreational establishments shall be al least two hundred (200) feet from any residential zone. ZONES: B2, I-1
- 61.01.28A- Product testing, Research and Development facilities
ZONES: IT, IOP (Amended effective 8/15/94), NPC (added eff. 1/15/99)
- 61.01.28B- Physical Fitness Centers
ZONES: B1, B2, I-2, and IRA (Effective 6/20/88), NPC (added eff. 1/15/99)
- 61.01.29- Retail sales distribution facility for the processing of orders for and preparation of pharmaceutical and related products in the health care field but not to include sale and delivery of product to customers on premises. (1/84)
ZONE: IT
- 61.01.30- Restaurant--With or without alcoholic beverages.
ZONES: B1, B2, I-1, TD*, NPC (Added eff. 1/15/99)
- 61.01.31- Retail business--whose principal activity is the sale of merchandise in an enclosed building (except automobile sales, boat sales, mobile home sales; etc., which tend to detract or interfere with a high intensity of pedestrian shopping activity).
ZONES: B1, B2, NPC (added effective 1/15/99)
- 61.01.32- Retail sales or rental--including lumber, paint, hardware and other building supplies; automobiles, trucks, trailers, boats, motorcycles, new or used; construction equipment agricultural equipment, power tools, new or used scientific and laboratory supplies.
ZONES: B2, I-1, IRA (Revised 8/1/86)
- 61.01.33- Retail sales in which both a workshop and a retail outlet are required, such as interior decorating, dressmaking, upholstering, printing, photographic reproducing, radio and home appliances, provided that no more

than fifty (50) percent of the total usable floor area of the establishment shall be used for servicing, repair or processing activities.
ZONES: B1, B2, TD*, NPC (Added eff. 1/15/99)

- 61.01.34- Retail services--including grocery stores; supermarkets; fruit, meat and vegetable stores; drug stores; garden store; barber shops; beauty parlors; clothes cleaning and laundry pick-ups; art and antique shops, artists supply stores; self-service laundries; departments stores including discount houses; variety and dime stores; dry goods and apparel stores; mail-order houses; and similar uses. (Revised effective 4/15/94)
  ZONES: B1, B2, TD*
- 61.01.35- Service establishments, including barber shops and beauty parlors; dry cleaning and laundry pickup stations for work to be done elsewhere; dry cleaning, using non-inflammable cleaning agents only, for work accepted on the premises; locksmith; radio and television repair shop; shoe repair; tailoring, dressmaking and pressing; newspaper stand; and similar uses. (Revised effective 4/15/94)
  ZONES: B1, B2, NPC (Added eff. 1/15/99)
- 61.01.36- Studios--motion picture, recording, television and radio production studios, transmitters and related equipment.
  ZONES: I-1, I-2, IT (Revision effective 7/1/86), NPC (added effective 1/15/99)
- 61.01.37A- Wholesale and warehousing of items manufactured on the premises.
  ZONES: I-1, I-2, IT (Revision effective 7/1/86), NPC (Added effective 1/15/99)
- 61.01.37B- Warehousing of items or materials not produced or created on the premises (except items prohibited as shown elsewhere in this Code).
  ZONE: I-1 (Revision effective 7/1/86), IRA (Revised 8/1/86), I-2 (Addition 2/15/88), I-4 (Added eff. 11/10/88), NPC (added eff. 1/15/99)
- 61.01.38- Office buildings--including general and professional tenants but not including mental health/substance abuse treatment facilities, offices or clinics. (Amended effective 5/1/97)
  ZONES: I-1, I-2, IT, IRA (revised 8/1/86)
- 61.01.38A- Offices except medical and dental but not including mental health/substance abuse treatment facilities, offices or clinics. (Amended eff. 5/1/97)
  ZONE: I-4 (Added effective 11/10/88)
- 61.01.39- Interstate Office Park Zone
  The use of the zone shall be limited to business and professional offices and corporate \ business offices. Business uses shall include but not be limited to, any occupation or trade primarily of a clerical nature such as insurance company or sales offices but shall not include commercial activities such as the manufacturing or assembling of wares.
  ZONE: IOP
- 61.01.40- DELETED (Effective 7/1/95)
- 61.01.41- Institutions
  ZONE: ID
- 61.01.42- Repair, replacement and reconditioning of diesel engines, components, power trains and equipment, but not to include junkyards or permanent outside storage of dismantled or salvaged parts, equipment or vehicles.
  ZONE: IT
- 61.01.43- DELETED (Effective 9/15/94)
- 61.01.44- Servicing repair, installation and assembly of computers and communication equipment, including two-way marine and automobile radios, emergency alarms and lighting systems, but not to include the general retail sales thereof.
  ZONE: IT
- 61.01.45- Motor vehicle services and repair and body and fender repair and paint shop, provided that no building or structure for said use is located within fifty feet of any residential zone and further provided that all outside storage of material associated with said business be screened so as to not be observable from abutting properties. (Revised effective 4/15/94)

ZONES:I-1, I-2, IRA (Revised 8/1/86), B2

- 61.01.46- Conference Center Complex. A hotel with a minimum area of 200,000 square feet on at least fifteen (15) acres and a minimum of two hundred fifty (250) rooms with multipurpose public meeting and conference rooms, auditoriums, ballrooms and assembly halls, together with customary conference center-hotel accessory uses, including, but not limited to, eating establishments, dining facilities and entertainment areas, all serving food only as well as those serving both food and alcoholic beverages, gift and other shops; swimming pools, sauna and steam rooms; barber shops and beauty parlors; secretarial and other services. (Effective 8/1/84)
  ZONE: IT
- 61.01.47- Manufacturing and distribution. Only in buildings which have been used, historically, for this purpose, and only in buildings with more than 40,000 S.F.
  ZONES: B1 (Added effective 3/12/92)
- 61.01.48- DELETED (Effective 5/8/96)
- 61.01.49- Business and Professional Offices
  ZONE: B3 (Added effective 6/30/93), NPC (Added effective 1/15/99)
- 61.01.50- A Golf Driving Range subject to conditions described hereafter: (1) that not more than 25% of the I-4 parcel is used as a driving range; (2) that not more than 10 acres of the I-4 zone parcel is used as such golf driving range; (3) that the sales office/pro shop has a land foot print not any greater than 900 square feet; and (4) that the Planning and Zoning staff approve the site plan as a whole including location of protective fencing and such other structures and improvements as the particular site shall demand.
  ZONE I-4 (Added effective 10/30/93)
- 61.01.51- Wholesaling, warehousing and distribution facilities employing greater than 50 employees (not to include terminal exclusively for the transfer of freight not owned by the building occupant).
  ZONE: IT (Added effective 8/15/94)
- 61.01.52- Biotech, telecommunication, and environmental service industries excluding those dealing with the transfer and/or final disposition of solid waste.
  ZONES: IT, I-2, IRA, I-4 (Added effective 8/15/94), NPC (added eff. 1/15/99)
- 61.01.53- Sports training facilities solely for the use by a professional sports team.
  ZONES: ID, IT, IOP (Added effective 8/15/94), NPC (added eff. 1/15/99)
- 61.01.54- Medical and Dental Offices
  Medical and Dental Offices with less than five (5) practitioners, specifically excluding those whose principal service is mental health and/or substance abuse diagnosis and treatment.
  ZONES: B1, B2, TD, MX (Added effective 5/1/97), NPC (added eff. 1/15/99)
- 61.01.55- Vocational School for Massage Therapy
  Including classroom training facilities, administrative offices, Student Clinic, Professional Graduate Clinic, and associated services and support activities involved in the daily operation of a Professional Massage Therapy Vocational School. All activities are to be in compliance with state statutes regulating the training and practice of Massage Therapy.
  ZONE: IT (Amended effective 3/30/99)
- 61.01.56- Design Center approved by issuance of a Special Permit (Special Exception) where the Design Center, including corporate offices, sales area, warehousing, and stone and tile distribution, is part of a Stone Fabrication facility. And where such Center:
  1. is located not less than a 1/2 mile from the entrance to an interstate highway; and
  2. is not greater in size than thirty (30) percent of the area of the combined facility and where such center is found to support or enhance employment in the on-site manufacture and fabrication of such items as are on display.

  A Design Center shall display stone items fabricated on-site and may incorporate other interior and exterior decorating items including architectural woodwork, wood inlays, cabinets, plumbing fixtures, works of art, and other

accessory and coordinated items and may also include offices, meeting areas for architects, decorators, and designers.
ZONE: IT (Added effective 7/31/01)

61.02- SPECIAL EXCEPTION USES- The following uses by special exception may be permitted in accordance with the provisions of Section 44.

- 61.02.01- Gasoline filling stations (44.08.13)
  ZONES:B2, TD (Amended effective 3/1/98)
- 61.02.02- DELETED (Effective 3/1/98)
- 61.02.03- DELETED (Effective 3/1/98)
- 61.02.04- Drive-in establishment, limited to drive-in banks (44.08.12)
  ZONES: B2, TD (Amended effective 3/1/98)
- 61.02.05- Eleemosynary or philanthropic institutions--need not be enclosed (44.08.15)
  ZONES: B1, B2
- 61.02.06- General retail use not expressly prohibited by this Code (44.04)
  ZONES: B1, B2
- 61.02.07- Junkyards and building material salvage yards.
  ZONES: I-1, I-2, I-3
- 61.02.08- DELETED (Effective 5/1/97)
- 61.02.09- DELETED (Effective 7/1/95)
- 61.02.10- Public utility structures. (44.08.11)
  ZONES: B1, B2, TD, IT, I-4 (added effective 11/10/88), NPC (added eff. 1/15/99)
- 61.02.11- Readymix concrete plant. (44.08.18)
  ZONE:I-1
- 61.02.12- Restaurant or lunch room (44.08.19)
  ZONES: I-1, I-2, TD
- 61.02.13- Taxi cab stand --need not be enclosed. (44.08.20)
  ZONES: B1, B2
- 61.02.14- Adaptive residential use for structures currently or recently occupied by non-conforming use. (Effective 5/1/89)
  ZONE: B1
- 61.02.15- Natural Resource Extraction (44.08.10)(Effective 5/1/86)
  ZONES: B1, I-1, I-2, I-3
- 61.02.16- Alcoholic Liquor Establishments (44.08.24)
  ZONES: B1, B2, NPC (Added eff. 10/22/03) (Amended effective 8/25/05)
- 61.02.17- Automobile, truck, trailer, farm implements and similar automotive equipment sales, new and used. (44.008.24)
  ZONES: I-1, I-2, NPC (Added effective 1/15/99)
- 61.02.18- Bustop Passenger Shelters (44.08.25)
  ZONES B1, B2, I-1, I-2, I-3, TD, IT, I-4 (Added effective 11/10/8), ID (Added effective 12/31/03)
- 61.02.19- Adaptive historic preservation use harmonious with the physical characteristics and originally designed use of the structure. (44.08.26)
  ZONES: B1, B2, I-1, I-2, I-3, TD, IT, B3 (Added effective 6/30/93), NPC (added eff. 1/15/99)
- 61.02.20- Banking facilities with drive-up windows. (44.08.12)
  ZONES: B1, I-2, IT, I-4 (Added effective 11/10/88), NPC (added eff. 1/15/99)
- 61.02.21- Child Care Facilities (44.08.12)
  ZONES: B1, I-1, I-2, I-3, TD, IT, B2 (Added effective 7/1/94)
- 61.02.22-Care/nursing homes (44.08.29)
  ZONES: TD, B2 (revised 5/1/97)
- 61.02.23- Solid Waste Facility (44.08.32)
  All proposals including expansion to existing facilities shall be subject to Category 4 Site Plan Approval.
  ZONES: I-1, I-2, I-3, ID, IT
  Except that: Solid Waste Disposal Areas (16.19.05) shall not be permitted in

the IT zone. (Amended effective 9/15/96)

- 61.02.24- DELETED (Effective 5/8/96)
- 61.02.25- DELETED (Effective 5/8/96)
- 61.02.26- Upper story multi-family dwelling designed as an integral part of a mixed use development.
  ZONE: B3 (Amended effective 6/30/93)
- 61.02.27- DELETED (Effective 5/8/96)
- 61.02.28- Recreation (commercial)--including billiard parlors and pool halls; bowling alleys; night clubs; theaters and other assembly halls; subject to all applicable regulations and such permits and licenses as may be required by law, and expressly prohibiting drive-in theaters.
  ZONES: B1, B2 (Added effective 2/28/94), NPC (Added effective 1/30/04)
- 61.02.29- Research, experimental and testing laboratories and light manufacturing in existing buildings in excess of 15,000 square feet.
  ZONE: B2 (Added effective 8/15/94), NPC (Added effective 1/15/99)
- 61.02.30- Trucking company terminals for storage, assembly, distribution, handling or transfer of freight.
  ZONE: IT (Added effective 8/15/94)
- 61.02.31- Golf Driving Ranges, Miniature Golf Courses, and golf courses.
  ZONE: I-2 (Amended effective 8/15/950, NPC (Added effective 1/15/99)
- 61.02.32- Antique/Flea Market whose principal activity would be to allow antique dealers and other vendors to see their merchandise.
  ZONE: I-2 (Added effective 7/1/95)
- 61.02.33- Commercial schools and art studios, business colleges, trade schools, dancing studios, photographic studios, radio and telecasting studios. There shall be no more than one (1) satellite dish per property and the diameter shall not be more than six (6) feet.
  ZONE: B-3 (Added effective 5/8/96)
- 61.02.34- Landscaping and Garden Center
  ZONE: I-2 (Added effective 1/31/97), NPC (Added effective 1/15/99)
- 61.02.35- Medical and Dental Clinics
  Medical and Dental Offices with less than five (5) practitioners, specifically excluding those whose principal service is mental health and/or substance abuse diagnosis and treatment.
  ZONES: B1, B2, TD, MX (Added effective 5/1/97), NPC (added eff. 1/15/99)
- 61.02.36- Corporate office/high technology processing of previously manufactured parts used in aerospace, automotive, medical and similar industries, provided, that such processing does not create hazardous, noxious or offensive conditions, and specifically excluding (a) traditional manufacturing (i.e. conversion of raw materials) and (b) the use, storage or disposal of medical or solid wastes. (44.08.42)
  ZONE: IOP (Added effective 7/3/98)
- 61.02.37- Indoor Recreational Facility. A facility where a fee is paid in exchange for activities, events, or programs related to athletics, physical conditioning and accessory activities conducted indoors.
  ZONES: I-4 (Added effective 10/13/06)

61.03- ACCESSORY USES- The following Accessory Use shall be permitted in accordance with the provisions of subsection 10.07 of this Code.

- 61.03.01- Use customarily incidental to the main or principal building or land use such as business office, conference/meeting facilities, data processing/storage, personnel services (i.e. dining facilities, child care facilities, medical services) and off street parking and loading space.
  ZONES: ALL (Revised effective 11/10/88)
- 61.03.02- Closely associated accessory uses as an integral part of the principal or main use or the premises, conference/meeting facilities, data processing/storage, personnel services (i.e. dining facilities, child care facilities, medical and emergency services), off-street parking and loading space, research laboratories and solid waste facility. Dining facilities serving

both food and alcoholic beverages shall be permitted in any office building housing any corporate headquarters or corporate branch office provided that the uses occupy a minimum of 500,000 square feet on a single parcel. Heliports or Helicopter landing areas shall be permitted as an accessory use only if the principal use is conducted on a single lot having an area of 20 acres or larger.
ZONE: IOP, IT (Revised Effective 8/1/86)

61.04- USES BY TEMPORARY PERMIT- The following are permitted as Temporary Uses.

- 61.04.01- Temporary office and building or yard for construction material of equipment and model all incidental and related to construction within the immediate area; provided, however, that each permit shall not be renewed for more than four (4) successive periods at the same location.
  ZONES: ALL

61.05- PROHIBITED USES- Any Uses can be reasonably considered to cause, despite existing environmental safeguards, hazardous or noxious conditions or which would violate Section 15.01, Performance Standards. Further any use not specified as a permitted use, special exception use, accessory use, permitted home occupation use or use by temporary permit are prohibited uses including but not limited to the incineration of solid waste, correctional facilities, alternate incarceration centers, methadone clinics, half way houses, rooming houses, tattoo and/or body piercing studios, pawn shops, check cashing establishments, and asphalt/batch plants. (Amended effective 4/15/98)
ZONES: All

- 61.05.01- no land or building, or any portion thereof, shall be used in the City of Middletown, for gambling purposes as a principal or accessory use (including land use for parking or other uses to benefit water based gambling). No manually or automatically operated gambling devices, video or otherwise, including, but not limited to slot machines, shall be permitted as principal or accessory use in any zone in the City of Middletown. Where such land or building is used solely for the benefit of charitable or non profit institutions this section shall not apply. Nothing in this section shall be construed to prohibit the sale of State of Connecticut lottery tickets in the City of Middletown.
  ZONES: ALL (Added effective 4/3/95)
- 61.05.02- Junk Yards
  ZONES: ALL (Added effective 1/22/03)

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SECTION 42- PROTECTION OF WATER SOURCES

42.00- PURPOSE OF REGULATIONS- To provide for the protection of water sources which are or may be used for public water supply. This includes unique geologic units called aquifers, capable of yielding usable amount of groundwater, and areas called watersheds in which surface water drains into reservoirs. The boundaries of the City's aquifer and watershed areas are shown the Zoning Map and are hereby designated the geographic boundaries of the water protection boundaries. (Revised effective 11/10/88.)

42.01- WATERSHED PROTECTION AREAS (WPA)- The Watershed Protection Area is an overlay district which provides for additional conditions, standards and safeguards to the permitted users of the underlying district in order to protect and maintain the surface waters and ground waters, of the Middletown Public Water Supply Watershed to a quality consistent with their uses as a primary source of drinking water for the City.

42.02- NON-PERMITTED USES- Within this district the requirements for the underlying districts continues to apply, except that the following uses are prohibited, even where the underlying district requirements are more permissive.

A. Any industrial, commercial or other use in which the manufacture, use, storage, transport, process or disposal of hazardous materials or waste is a primary use.
B. Sanitary landfill, septage lagoons, waste water treatment facilities for municipal or industrial waste, or other waste processing or transfer facilities.
C. Road salt storage and salt storage loading sites.
D. Junkyard, salvage yard, truck terminal.
E. Vehicle service operations. To include but not be limited to fuel stations, auto service stations, body shops, rust-proofing, and auto sales dealership.
F. New or enlarged fertilizer storage facilities.
G. Engine repair or machine shops.
H. Dry cleaners, printers, furniture strippers, photo processors and labs.
I. Medical, dental or veterinarian offices, beauty salons, kennels, car washes, science, research or medical laboratories.
J. Cemeteries, in compliance with State Statute prohibitions.

42.03- COVERAGE, BUFFERS, AND SETBACKS- Within the Watershed Protection areas, the following additional lot requirements shall apply except for 1 and 2 family residential lots which are excluded. In the instances where the underlying zone requirements are different, the more stringent shall apply.

A. Total lot coverage shall not exceed 60% of the lot area. To be included in the

60% maximum, include but not limited to the following: all buildings, walkways, travelways (paved and unpaved), paved islands, paved boulevards, impervious storm water management structures, and other structures deemed applicable by the Planning and Zoning Commission.

B. A minimum of 20% of the total lot area parcel within a proposed subdivision shall be retained in its natural state. The 20% shall be incorporated in the site plan to buffer sensitive wetlands, water courses, and public water supplies. In those areas where previous land disturbances has occurred, this 20% shall be restored and re-vegetated in keeping with the intent of the regulation.
C. Minimum buffers, from buildings, structures, septic systems, impervious surfaces, and other sources of pollution, shall be maintained as follows:
    1. One Hundred feet (100') shall be maintained between water courses and wetlands contributing to the public water supply, and the developed land area.
    2. One Hundred feet (100') shall be maintained between water courses and wetlands contributing to the public water supply, and outlet drainage structures to include but not limited to level spreaders, splash pools, detention and retention basins, and flared end outlets. There shall also be a demonstration by the developer that within this distance there is no more than a minimal impact on the public water supply from point source hydraulic loading.

42.04- OTHER REQUIREMENTS AND RESTRICTIONS- The following requirements shall apply:

A. No discharge of wastewaters to surface and groundwaters are permitted unless allowed by State Statue and/or Planning and Zoning Regulations.
B. Underground storage of hazardous materials as defined by the DEP and EPA is not allowed. Underground fuel storage tanks are also expressly prohibited; except underground storage for propane will be allowed provided the installation meets all other applicable codes.
C. Above ground storage of hazardous materials as defined by DEP and EPA is quantities greater than associated with normal operation of the approved use, normal on-site clerical and on-site janitorial use, other than fuel storage for space heating, is not allowed. Fuel storage for space heating shall be in an environmentally protected area and shall be set within an impoundment area that is 110% of the volumetric capacity of the fuel storage tack. Areas where hazardous materials are used, handled or stored shall be designed as follows:
    1. Floor surfaces shall be impermeable to stored materials and have containment dikes, sumps, or berms surrounding them. unless other acceptable methods are used, a containment area shall be constructed to contain 110% of the maximum storage volume.
    2. There shall be no floor drains in storage areas. Floor drains may be allowed in processing areas if connected to a public sanitary sewer and proceeded by an approval treatment system, or approved holding tank.
    3. Areas shall be enclosed and roofed to protect it from the weather.
    4. Dumpsters used for wastes shall be covered or located within a roofed area, have drain plugs intact, and be on impermeable surface away from storm drains.
    5. Loading docks shall be designed to protect spillage or discharges, and located away from storm drains.
    6. A maintenance and inspection schedule of the areas or structures may be required.
    7. A spill response plan shall be provided to the City's Water Pollution Control Authority and updated annually. The spill response plan shall include the availability of spill containment materials onsite, as a part of the plan.
D. Stormwater management facilities shall be designed to manage site runoff to prevent surface and groundwater pollution sources and where required control peak discharges and provide pollution treatment.
    The following measures and restrictions shall apply:
    1. All raw materials and waste materials shall be stored and handled so as to prevent contact with stormwater.

2. The use of underground drywells is not allowed for any stormwater from developed areas, except for roof drainage in groundwater supply areas. Such structures may be used in reservoir watersheds, where structures would threat runoff and not attract ground water supplies.
3. Detention ponds, basins, swales, grease, oil, and grit separators, or other measures designed to treat runoff, contain pollution, and control peak flows, and infiltrate clean water, may be required. It is the applicant's obligation to demonstrate that development has less than a minimal impact to the otherwise undisturbed natural runoff from the site.
4. Restriction of road salt (NaC1) application.
5. Where it is determined that development may result in significant water quality effects from development runoff, the proposal may be referred to the State's Department of Environment Protection and/or the City of Middletown Environmental Planner for an advisory comment. A maintenance and inspection plan and schedule, shall be provided.

E. Where the use poses a significant threat to water quality due to total structure loss of fire, fire protection, response, and containment measures may be required (e.g. public water, sprinklers, chemical extinguishers, and similar measures).
F. Where potential exists for public sewers to be used for wastes other than domestic sewerage or where the sewer line passes through or adjacent to a sensitive resource area including a water course, wetland or stratified drift aquifer, the sewer line shall be constructed in accordance with good Engineering Standards, as approved by the City's Water & Sewer Department.
G. Unless otherwise acceptable, all treatment and protection structures, facilities, and measures shall meet State Department of Environment Protection standards, or in compliance with Best Management Practices (BMP) and Best Available Technology (BAT) guidelines (including, but not limited to, oil/water separators, detention basins, retention basins, aeration structures, gross particles separators, and biofilters).
H. If any proposed treatment, measure or practice is in question, it may be referred to the State Department of Environment Protection, State Department of Public Health, City of Middletown Environmental Planner, or other agency for review and comment. Evidence or required permits or approvals may be required and the Commission may require additional modeling, analysis, and evaluation to assure that there be no negative impacts on the Watershed. The applicant shall be responsible for any additional fees as a result of these requirements.
I. Uses are subject to the site plan requirements of Section 55 of the Zoning Code.

(Section amended effective 5/26/98)

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Appendix H

Highlights of the Public Meeting on November 12, 2008 and March 23, 2011 And Comment Regarding the Environmental Impact Evaluation and Water Main Extension Feasibility Study Update

Public Hearing
7:00 p.m., Wednesday, March 23, 2011
Lower Level Meeting Room, Durham Public Library

Presentation by Fuss & O'Neill on the findings of the Water Extension Feasibility Study Update and Environmental Impact Evaluation

Meeting Minutes

In attendance: Kevin Flood, Fuss & O'Neil, Representatives from CT DPH & DEP, Representatives from the Federal EPA, Representatives from Middletown, Anni Laughlin EPA

Laura Francis opened the meeting. This hearing is to present the results of a study commissioned first about 12 years ago and then again about 3 years ago to study the feasibility of bringing clean drinking water from the city of Middletown to Durham to specifically address the superfund contamination site. What is different from this study compared to the one done 12 years ago is that we did include other sites of Durham that are either contaminated for other reasons or have some other kind of quality or quantity issues. She then introduced Kevin Flood from Fuss & O'Neil whose agency was chosen to conduct the study that was funded by the State of CT. Question and answers will follow the presentation. L. Francis reiterated that persons in attendance should remember that this study was conducted with one solution in mind; bringing clean water in from Middletown to Durham.

Kevin Flood presented the attached PowerPoint presentation dated March 23, 2011. A summary of two projects that they did; update to the feasibility study that was completed in 2000 and also as part of the study completed an environmental impact evaluation.

Presentation attached

Questions & Answers

Senator Ed Meyer; one of the issues that we (Representative Matt Lesser) have is we introduced legislation on this, what will the role of DEP be? In the bill that they introduced DEP would become responsible for working with Fuss & O'Neil to prepare a plan recommendation from the timeline of implementation. Senator Meyer and Rep Lesser would then look into state bonding to pay a substantial portion of the cost and that could be phased in over a period of time; how does this fit into what you have done?

L. Francis; we need to remember that Fuss & O'Neil is the vendor for this study, the next step will be that we will have to partner with DEP, DPH, and hoping because of the superfund site that EPA will also be a partner. She pledged the town's cooperation with all of these agencies and proposed that a planning work group be implemented immediately, to start work on this. She does not want to let this study sit on the shelf as the other one did. Owe it to the Main Street residents and to the rest of the community who values the center of town to find a solution and to start implementation; good 3 to 5 years or maybe even longer timeframe to complete. She appreciates Senator Meyer moving forward trying to get funding available.

K. Flood; partnering with state agencies is one facet of the loop, the other facet is partnering with the towns that we will be working with; Middletown and Cromwell as well, agreements will need to be put in place and how the water will be transferred and paid for. Have momentum and need to push forward and by setting up that working group will be a good start.

L. Francis; in addition to the agencies that were mentioned, the City of Middletown and Connecticut Water Company will need to be included; part of the study area did include a service area that is now being provided by the Durham Fair wells. As we move along we may need to include other agencies. Have to form a core group. Final partners will be residents; every step of the way we have recognized

we will seek funding from the Federal and State Government but at no time did we think that the Town of Durham would not have to contribute to this process in some way; local funding approvals that will be necessary.

Senator Ed Meyer; asked for an update on the work to be done at the superfund site this summer and fall.

L. Francis; responded that she thought that the cleanup at this site was very exciting to this process because the timing is important. The town has a piece of property that is going to be cleaned up and it will be usable except there won't be a water supply. The town learned very clearly a couple of weeks ago that it will be impossible to drill a well on that property for drinking water purposes; cleanup done at this site will not significantly impact the waters favor.

Anni Laughlin, EPA; responded that a well could be drilled but would need to be treated. EPA is going to be having their contractors clean up a very significant amount of soil on this property this summer and do expect to finish this calendar year. There is a lot of contamination and in some cases very heavily contaminated soil, however the EPA does not expect that the cleanup of the soil is going to have a significant remediate impact on bedrock groundwater contamination. The EPA's common theory is that a lot of the solvent contamination was disposed to soil and has migrated down into bedrock; the bedrock underneath the whole superfund site areas is highly fractured which means that the solvent which is denser than water has seeped down into the cracks and pooled, that is why you see that ground water contamination has held pretty steady (for about 30 years) since the problem was first discovered. They do not expect, by having the work done, that potable wells will be clean; we do hope that over time it will definitely help with regard to the bedrock contamination, they would not expect to see perhaps for decades any significant impact.

Matt Lesser, State Representative; one of the things touched on in the presentation is the possibility of contamination spreading.

K. Flood; it could potentially occur. Existing wells that are in place that are being pumped and used by residents on Main Street, that are now served by a supply and wells are shut off; the contamination and the normal ground water flow is basically towards the southeast, which is where the Durham Fair Ground wells are, so the length of time that it would take for that contamination to migrate, could be years.

Anni Laughlin; mentioned that in addition to the EPA record of decision for the superfund site, there is a companion piece in our record of decision which says that after the water line goes in another part of the remedy is the EPA has to set up a monitoring network that basically surrounds the whole plume to watch to see what happens to that plume when all private wells essentially get shut off and introduce water to the area; there is a provision for watching that plume when the waterline does come in and everyone gets hooked up. There is also a contingency that talks about doing some sort of ground water pump and treat for containment if they do find that the containment is spreading significantly.

M. Lesser; saw a big difference between Durham's fire protection, no fire protection and towns currently served by fire ponds, and wants to know how well that is working; is this something that will add to the cost.

L. Francis; has not spoken in depth with the towns fire company. They would not turn away fire protection. Quite frankly with fire protection coming down Main Street would improve significantly the way the whole town gets insurance. Funding will also be in question; we would appreciate a bigger line coming in especially in those other areas that will be included in the future.

Anni Laughlin; as part of the record of decision the EPA has questioned internally whether they could legally fund fire protection to Durham, given that the town currently does not have enough systems for fire protection. Since then the EPA has revisited this issue internally and it comes down to a legal

decision; they have guidance on providing alternate water supply that seems to imply that the EPA could and should be providing fire protection in situations like this, although the language is not entirely fire. They have consulted with headquarters office and so far the feedback is it seems that everybody would need to support a concept of adding fire protection to this project. From EPA's perspective that it something they would be pushing.

L. Francis; that is very different from when we started this conversation and is very encouraged by that.

M. Lesser; echoed the timing issue; has been going on for a very long time. This is one of the reasons why Senator Myer and I introduced this bill; need to get the ball rolling, not something that can be put off.

K. Flood; I think that everyone should be aware that the costs presented are 2009-2010 numbers and they are going to change.

Resident; questioned what the impact on home values in the area described in the presentation; what impact has been or is.

L. Francis; can answer anecdotally not concretely and that is typically houses on Main Street in that area are on the market for a long time. It depends on the sensibility of the potential buyer, whether they have confidence in the filtration systems or not.

Resident; asked if the 3-5 years would be when the study was finished or working on it.

K. Flood; the study is finished now; 3-5 years to hopefully get it into construction; pending funding.

Rick Parmelee; talked about the wells on the Durham Fairgrounds that are owned by the town and on town property; restrictions were brought under a grant for future water use. In reference to the South Central proposal being 8 miles, if that main was brought through the South Central Water Company would does this proposal have the Town of Durham bearing the entire cost? If so, would it be possible to recoup some of that cost?

K. Flood; no that was just a cost to get to that point. How that would work with South Central is not known yet. The regional interconnection; South Central Ct Regional Water Authority interconnection has to go through the Durham center area to get to the contaminated superfund site area and beyond and because of that they would have to serve the existing Durham center area by that new extension because they couldn't mix the Durham Fairground well water with the South Central water. That extension is strictly the capital cost to get if from the end point of the South Central system up to the superfund site area.

R. Parmelee; how did Wallingford not get mentioned?

K. Flood; the connection through Wallingford does not have enough available supply.

R. Parmelee; different times over the years the town has put money into Durham Heights to drill wells and there was discussion with Middletown that the town might partner with them. Sources of water that were investigated were the high school and a well by Perk on Main, why were they not mentioned. Looking at the proposal in general I personally would be looking to fire protection. Why is Durham Heights in on this?

K. Flood; sewers are the limiting factor. There will be some growth when potable water is available but that is really limited by whether or not you get rid of it. There are mostly sub-surface disposal systems in town so you are limited as to how you will get rid of your waste water. Durham Heights was included because there was past bacterial contamination, water quality issues on homeowner wells so

if the water is running right by along Rte 17 it appears that it would be a natural fit if there is enough funding available.

R. Parmelee; what is it going to cost these homeowners not responsible for the problem and how ist he town going to recoup money from those that are responsible?

Anni Loughlin; if the state legislature passes something to pay for this project then no one else will have to pay anything. If there was no state funding for this project at all then the funding questions would start with EPA; their authority only extends to the superfund site and immediately surrounding areas. All EPA would endeavor to fund is the water line coming down, all the piping within the superfund site area, including hookup to all of effected homes. As part of this project out of necessity the EPA would have to pay for a storage tank, the upgrading of the pumping station, and replacement of water main; only water service to this area. Something needs to happen in Middletown in order to make this possible. EPA superfund program always seeks to have the responsible parties; companies that polluted and created the problems in the first place, pay or perform the work. The two sources of contamination at the superfund site are Merriam Manufacturing Company and all its related entities and Durham Manufacturing Company. The EPA will need to negotiate with Durham Manufacturing Company in the future if funds are not available to see if they can contribute to the project. EPA is currently actively negotiating with Merriam Manufacturing and the estate of Alan Adams who used to be the president and owner of Merriam.

L. Francis; in terms of other hookups outside of the superfund site there will be a homeowner cost to hook up. The project brings it to the curb and it is then the homeowner's responsibility to hook up.

K. Flood; typical service installation is anywhere from $1,500 to $5,000 depending on the length. Some towns will bond it and pay for it upfront and assess the homeowner; can pay for it over a number of years or it could be an upfront cost.

Bill Milardo; talked about well hookups; after water is hooked up to your home by the EPA they will be out of the picture. You would then be running your own well to the pump, through treatment - unless you will be doing this yourself, and will be taking in contaminated water. He noted that filters would not be a good idea.

K. Flood; talked about the plum density migrating. Do not want people to be alarmed by thinking as soon as you turn off your well it will fly down to the south and west; it will take many years.

L. Francis; to manage expectations it may take up to 3 years to get the funding. We have already starting talking with DEP on some strategies; it will include the bond function. There is no current pool of money. We will know this summer if the funding bill that Senator Meyer and Representative Lesser put in is successful. That is why she wants to start this planning group as quickly as possible because the engineering is a whole separate challenge. Permitting alone could take a couple of years.

Gill Richards; there is no law in Connecticut that requires an abandonment of a well and but under a superfund case or DEP consent order that is absolutely part of the agreement and makes the most sense and is paid for in most cases. Property values do increase with the abandonment of the well. If you are putting a new well in within 200 feet of the water main you have to connect unless you can prove hardship other than that there is no requirement per say.

Annie Laughlin; the fact that there are homes with contaminated private wells even though they are being filtered, will weight very heavily for this project being funded sooner rather than later. There are many sites that are seeking funds, all pose different risks, and never really know from year to year what you are up against. Also, mega sites draw for funding right off the top year to year.

Gill Richards; there is a DPH source, Drinking Water State Revolving Loan Fund, low interest; Durham rated number #1 in the state four years ago because of the number of systems along Main Street that would have been consolidated. Any water company could apply for that.

Gill Richards; DEP looked at the most immediate and cost effective solutions; Miller's pond falls would be very low yielding, very high initial cost and high annual costs forever. When Cromwell interconnection would have a potential 3 million gallons at 2.7 million; you weigh what your best benefit is from a cost standpoint.

Meeting adjourned at

Respectfully submitted,

Beth Moncata

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

May 20, 2009

Ms. Fereshteh Doost, P.E.
Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040

Dear Ms. Doost:

DEP has reviewed the April '09 Draft Feasibility Study and Draft Environmental Impact Evaluation for extension of a public water supply from the City of Middletown to the Town of Durham. DEP has also reviewed the supplement to the Feasibility which was received by e-mail on May 12, 2009. The DEP comments are attached. If you wish to discuss or clarify any of these comments, please contact me.

Yours truly,

Martin M. Beskind

Martin M. Beskind
Remediation Division
Bureau of Water Protection and Land Reuse

Cc: Anni Loughlin, EPA
Steve Messer, CT DPH
Laura Francis, Town of Durham

DEP COMMENTS ON DRAFT DURHAM WATER SYSTEM EXTENSION FEASIBILITY STUDY, APRIL 2009

Note: Comments on Middletown Water System supplement are included.

INTRODUCTION

Section 1.1, Purpose of Study

a) First Paragraph: Beginning of First Sentence: Replace "Several water quality issues" with "Persistent contamination of groundwater in several areas of Durham, ..."or similar phrasing that emphasizes the severity of the ground water contamination.

b) First paragraph: End of First sentence: Replace"into the center of town" with wording to the effect "to areas north of Allyn Brook". This will avoid confusion with the existing Durham Center Water System that serves properties south of Allyn Brook. Add a phrase at the end of the sentence indicating the extension of public water to Durham is consistent with the selected remedy for the Durham Meadows Superfund Site.

c) First paragraph: Second sentence: After the first sentence, insert a simple sentence stating that the Durham Center Water System supplies many properties "The existing Durham Center Water System serves properties south of Allyn Brook. Continue with the existing second sentence noting that capacity of that system, absent a Diversion Permit, would not be adequate to service the entire Superfund Site, no less other sections of town.

d) First paragraph, third sentence: Change "had" to "has". Consider qualifying this statement after reviewing DPH's comments with regard to the adequacy of the Middletown supply.

e) Second paragraph, first sentence: Replace the second half of the sentence beginning "into the areas of Durham....." with "to the Superfund Area in Durham as depicted in Figure 8 of the EPA's 2005 ROD for the Durham Meadows Superfund Site and to other areas in Durham impacted by, or threatened with, groundwater contamination."

f) Third sentence in second paragraph: Modify the language. For example consider, "Figure 1-2 depicts areas impacted by, or threatened with, groundwater contamination as well as a few other areas considered for inclusion to a public water system."

Item 1, Second sentence Insert "and in adjoining sections of Middlefield" after "identify the areas in Durham"; delete the last portion of the sentence.

Item 1, Third sentence and fourth sentences: These should form a separate task, "Extent of Proposed Water System – Various Cases". This task should follow Task 3. Delete "based on immediate service requirements" at the end of the third sentence. Add a sentence indicating that all "scenarios" include service to the Superfund Area.

Item 1 List of proposed service areas Modify as follows:

B. MTBE area along Main Street: Add "Gasoline Stations Area" in parentheses.

E. Delete "and Private Properties".

G. Change to Woodland Road Area.

Item 2 Distribution System The second and third sentences refer to data collection for the Town of Durham and should be included in a separate Task. See item 2 in the April 30, 2008 Proposal for Engineering Services, "Data Collection – Town of Durham".

Item 4 Size Important Components, first sentence: Insert "improvements in Middletown" after "Preliminary sizing of infrastructure". Delete "to understand how..."; simply state "to supply water to the Town of Durham" or similar.

Item 5 Alternatives for the Durham Center System include this alternative with "Extent of Proposed Water System – Various Cases". This should not be a separate task.

1.3 EXISTING WATER SYSTEMS This section should be very short. The main point is no one system that supplies properties north of Allyn Brook.

1.2.6 Develop preliminary opinions of cost for the proposed water system extensions Elliminante "in the various scenarios identified" at the end of the first sentence. Add a sentence, to the effect that "Construction costs are then developed for each of the scenarios."

1.2.7 Schedule The first sentence needs a verb. Consider, "Develop a tentative schedule for the design and construction of the recommended water distribution system including necessary upgrade to the City's of Middletown's system."

1.3 EXISTING WATER SYSTEMS This section should be very short. Simply state that there is no centralized water system that supplies clean water to properties north of Allyn Brook that are impacted by, or threatened with, groundwater contamination; there are a number of small systems that feed one or more properties – the most prominent being the system that feeds the Korn School, the Coginchaug High School and the Strong School; all the small systems utilize local groundwater as the water source. In many cases, the water requires carbon filtration to render it safe to drink. Whereas maintenance and monitoring of these individual systems does render the water safe to drink, a centralized water supply is needed in Durham since contamination is widespread and persistent. Delete the lists of non-community systems. Avoid the use of the specialized terms e.g. "public water systems", "community", "non-community", etc. to describe these very small systems. While technically correct, the term "public water system" may confuse a lay person reading the report since the term "public" can be understood to refer to a larger system serving the entire community (as used on the opening section of this report).

1.4, Title Consider titling this section, "Contaminated Groundwater Areas", or similar.

1.4, Opening paragraph This paragraph is not needed. The section can be introduced with the two sentences following the paragraph. Simply describe the areas of contaminated groundwater, as prescribed in the scope of work. For the record, note that the first sentence states that groundwater contamination prevents property owners from obtaining a reliable and safe supply of drinking water. The statement is too strong, and not accurate. Connection to a professionally maintained water system does provide the greatest protection of human health. However, carbon treatment point of entry systems can provide a long-term safe and reliable supply of drinking if properly maintained and monitored. The use of "temporary" to describe carbon filtration is also to be avoided, for the same reason.

1.4.1 Durham Meadows Superfund Site Condense these sections. Simply state that disposal of paint wastes and solvent residue, as well as leaks and spills of solvents, at the Merriam and Durham Manufacturing properties caused contamination of soils, bedrock and groundwater. Describe the extent of groundwater contamination in general terms. Note that contaminant concentrations at 38 properties exceed safe drinking water levels. Water supplies at these properties are subjected to carbon treatment with regular maintenance and monitoring provided CTDEP and Durham Manufacturing (as properly stated in this draft). Note that the Superfund area includes 38 locations that require carbon treatment to provide safe drinking water. The remainder of the properties included in the Superfund area comprise a buffer area where contaminant levels either are lower or absent. The buffer area allows for potential spread of contamination that may occur when an outside source of water (from the public water system) adds to the groundwater flow and pumping of local supply wells ceases. See comments by EPA.

1.4.2 MTBE SITE Name the three gas stations and give their addresses: FasMart (formerly Dairy Mart) at 384 Main, the former Shell Station at 336 Main St, and the Grippo's Station at 349 Main St. Approximate information is as follows:

Source Location	No. of Impacted Locations	No. ofThreatened Locations
Former DairyMart	2 (2 with filters)	4
Former Shell	3 (4 with filters)	4
Grippo's Station	0 (2 with filters)	4

Impacted = above safe drinking water level of 70 ppb for MTBE. Information is approximate. Since you indicate approximately 15 properties in this area, either simply state that 8 properties are equipped with filters OR list the locations with of all 8 filters based on information DEP transmitted earlier. Do not leave an incomplete listing of locations with filters. (Four locations associated with the Former Shell are listed; locations associated with Dairy Mart are listed in the draft report.)

2 WATER SERVICE AREAS

2.1 Third Paragraph Consider dividing this sentence. For example: "Subsequent case studies incorporate the Superfund area and one or more of the other areas. Where practical, mains are routed so that water can recirculate from the central main on Main St. and return to the central main. Such "looping" provides best conditions to maintain water quality and pressure."

2.2 Rather than "Initial Service Area – Superfund Site (Area A), consider simply "Superfund Site – Area A" or "Base Service Area – Superfund Site".

2.2 First Sentence Consider, "In order to supply public water from Middletown to the Superfund area, a transmission main...."

2.2 Second Sentence Delete. It is not needed here.

2.2 Third Sentence Consider modifying the end of this sentence. For example, "...would form the backbone of all the cases studies."

2.2 Fourth Sentence Delete if the above modification to the third sentence is adopted.

2.2 Fourth Paragraph Add a statement regarding which properties in the Superfund will be provided with service connections from the main to the building.

3 WATER DEMANDS

3.1 Although it may seem obvious, please state that water demands assume that all developed properties in each area are connected to public water (even though actual connections are provided only in the Superfund Area).

DISTRIBUTION SYSTEM

4.2 Is 5 fps applied for sizing both the central main along Main St. as well as the branch mains? Is this a generally accepted basis for initial estimates? How does pressure drop vary with pipe diameter at 5 fps?

4.5.1 Add that the "spine of the system would extend south of Allyn Brook if Area I is included in the water system.

4.6 System Layout The statement that 85 properties in the Superefund area have documented well contamination is not accurate. Be guided by EPA (the EPA comments may address this issue).

CHERRY HILL STORAGE TANK

5. 1 Last two sentences in second paragraph: Please discuss what sort of potential demands may not have been considered.

6 PROJECT COSTS

6.1.1 Assumptions Item 5 The cost of the main and laterals account for approximately 60% of the capital cost. Document the basis for unit charges per foot of main and lateral, and associated costs per cubic yard allotted for rock excavation.

6.1.1 Assumptions Item 5 Allowance for excavation through rock is included over 10% the length of the central main and laterals. How was the 10% determined? By examination of bedrock surface elevation?

6.1.1 Assumptions Amend Item 8 to include upgrades to the Long Hill Pump Station and replacement of the Talcott Ridge Drive water main.

6.2 Cherry Hill Storage Tank & Water Main Replacement Why are general site work and piping connections omitted from the cost estimate?

6.2 and 6.3 Further information should be included in these sections of text to explain the basis of the cost estimates. These explanations need not be detailed – for example, simply state "based on available costs of similar tanks or pump stations", or "based on a quote from fabricator", etc. Refer the reader to notes on Tables 10 and 11, as appropriate.

6.3 Upgrade of the Existing Long Hill Pump Station Confirm whether the upgrade costs are over and above any costs planned for the existing Middletown system without supplying Durham.

IMPLEMENTATION

8.2 PERMITS A Diversion Permit is needed to interconnect between service areas. For diversions of up to 1,000,000 gallons per day, the applicant may be eligible for a general permit. If Durham were to transfer its service area to Middletown, then the extension would not serve as an interconnection. The extension would simply be an expansion of Middletown's system. In that case, a diversion permit would not be needed.

9 SUMMARY AND RECOMMENDED PLAN

Opening Sentence Begin the sentence with the following – or similar - wording: "Persistent and widespread groundwater contamination and other water quality issues have prompted.....

Second Sentence Instead of "...prevent..." consider including the following: "Carbon filters at more than fifty properties continue to require maintenance and monitoring to provide safe potable water. Groundwater contamination (solvents and petroleum products) persist in the following areas:

- VOC contamination .....
- Petroleum product pollution (including MTBE)....
- Dichloroethylene (1,1DCE) .....
- VOC contamination at a few wells in the Parsons area (add this fourth bullet

Add the following (or equivalent wording) statements: "Supply of public water to the areas listed above is a safer and more reliable than carbon filtration at individual properties.

Water quality problems exist in the following areas: (list these last two bullets separately)

- Bacteria, hardness.....in Durham Heights area
- Hardness, ...in Woodland Drive and Royal Oak areas

Except for bacteria that persist at a few properties, these water quality problems do not present a public health threat."

(Continue with the second paragraph, "As a result of the groundwater contamination.....range from $10,047,000 to $15,366,000.")

Third paragraph Make it clear that service connections from the water main to each building in the Superfund Area are included in the cost estimates.

Figure 1-3, "Existing Water Systems" The figure includes the maximum extent of the proposed water system (indicated by the network of red lines with "w" markings). Reference to, and delineation of, the proposed system does not belong here. Delete both.

Figure 1.5 This figure should only show the study areas. Eliminate reference in the title and coloring elsewhere to document contamination. Rely on figure 6 for this.

Figure 1.6 Add a note that bacterial contamination currently is limited to a few homes.

Figures 1-5, 1-6, 4-1, and 9-1 These maps are labeled N.T.S., i.e. not to scale. Yet these are detailed street maps – very similar to those in the May 2000 Fuss & O'Neill Feasibility Study where scale is reported 1" = 1,500 ft. If appropriate, please add the scale to appropriate figures.) A scale is shown on Fig. 1-3. Please coordinate these scales.

Table 10 and Table 11 Please change comment 4 to note that 25% Contingency and 15% Engineering/Administration costs for Middletown improvements are not shown – but are included in the rounded totals in the Summary Table at the top. (It would be best to show the Contingency and E/A costs for Middletown improvements if possible.)

Middletown Water System

Discussion and tabulation of available water capacity need to be revised. Based on conversations with Steve Messer, Department of Public Health, and Terri Schnoor, Planning and Standards Division, Bureau of Water Protection and Land Reuse, DEP, the approved current total available water of the Middletown Water System 6.36 MGD. This capacity includes currently available groundwater wells (excluding Wells 1 and 3) and surface water supply from the Higby Reservoir system. The currently available water of the River Road Well Field is 5.15 MGD at 18 hours pumping; the available water yield of Higby reservoir system is 1.22 MGD. The Table in the Middletown Water Supply supplement of the Draft Feasibility Study should be revised accordingly.

The available ground water capacity is derived by adjustment of the 24 hour safe yield on Table III-4b of the water supply plan (on page III-17 of the revised 2004 Water Supply Plan, revised page dated December 13, 2009) The Table lists a available water capacity of 4,763 GPM a corresponding value of 6.86 MGD. The MGD value is apparently based on 24 hour pumping capacity (4,763 GPM X 60 min/hr X 24 hrs/day = 6.86 MGD). The approvable value of available capacity, however, must be based on 18

hours of pumping per day. Accordingly, the groundwater safe yield should be 4,763 GPM X 60 X18 = 5.15 MGD.

DPH requires a 1.15 factor for margin of safety based on the maximum month daily average demand. For Middletown, the MMADD is 6.42 MGD in 2009. Based on the information outlined above, available water is 99% of the MMADD. There is no margin of safety for Middletown and no excess water to supply Durham. Measures need to be taken to increase the quantity of available water.

DEP COMMENTS ON APRIL '09 DRAFT EIE

Include a discussion of appropriate protective measures for the conservation area in southwest Middletown. Include the following information:

State of CT mapping shows the conservation area extending on both sides of Route 17 In the southwest corner of Middletown and in a sliver in the northern tip of Durham. Zoning in Middletown is limited industrial (I-4) on the west side of Route 17, and residential (R-45 on the east side of Route 17). The Middletown mapping shows the conservation area for the Laurel Brook reservoir to extend from the reservoir in Middlefield – but ending just a bit before the west side of Route 17 i.e. a smaller area than shown for the watershed on the state map. The I-4 zone restricts types of businesses allowed (see Section 61 of the zoning code – it can be found at www.middletownplanning.com).

Protection of watershed areas is included elsewhere in Middletown's zoning code. Section 42 is a Water Supply Source Protection Ordinance that includes watershed lands. Any proposed development within an aquifer protection overlay zone or watershed must comply – uses of new development are limited and require a Site Plan review process which includes review by the Middletown Health Department and Watere & Sewer Department for sites which require public water.

Miller's Pond (Alternate Source)

1. DEP purchased this land from the George W. Seymour Endowment fund. The deed restricts the use of the land to recreational activities. The stipulations in accepting the Funding from the George Seymour Trust would preclude the use of Miller's Pond for anything other than recreation. The State Parks Division also wishes to preserve the ability to build out a small park and provide public swimming in this area in the future. If this became a public water supply, that would not be possible.

2. A Diversion Permit would be required if it were possible to somehow change the use to supply potable water.

3. The watershed is small. A more detailed assessment – beyond the scope of the current project – would be needed to estimate the quantity of water that could be supplied from the pond- and whether this capacity would be adequate to meet demands in Durham.

4. This alternative would be expensive - more expensive than the extension from Middletown. Whereas Middletown's supply is treated in existing facilities, a new treatment facility, including

filtration, would be needed for supplying public water from Miller's Pond. The pond is approximately 2.5 miles from the center of Durham. The actual route of the line would likely be longer if it is to run along existing roads.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ONE CONGRESS STREET, SUITE 1100
BOSTON, MA 02114-2023

May 14, 2009

Fereshteh Doost
Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040

Re: EPA Review of Draft Fuss & O'Neill *Environmental Impact Evaluation, Durham Water System Extension*, dated May 2009

Dear Ms. Doost:

The United States Environmental Protection Agency (EPA) has reviewed Fuss & O'Neill's Draft *Environmental Impact Evaluation, Durham Water System Extension* (the "Draft EIE"), dated May 2009 and submitted by Fuss & O'Neill on May 12, 2009.

EPA's comments are included as Attachment A. As with Fuss & O'Neill's Draft *Durham Water System Extension Feasibility Study Update*, dated April 2009, EPA's review focused mostly on the scope of the water line, especially as it relates to the Durham Meadows Superfund Site. Generally, EPA has similar comments and corrections regarding text in the Draft EIE describing the Durham Meadows Superfund Site, as it did with the Draft Feasibility Study Update, including the number of contaminated wells within the Superfund site.

Although EPA recognizes the desirability of a water system extension that provides potable water and fire protection to as many of the contaminated well areas as possible, we recognize there are significant funding challenges that may ultimately limit the scope of the final project. It is EPA's understanding that a possible future scenario is one in which potable water service is only provided to the Durham Meadows Superfund Site and no other areas. Therefore, this report, as well as the Draft Feasibility Study Update, should clearly outline a minimum base water system extension that only provides potable water to the Superfund Site and no other areas, including looping of the water system as appropriate to only service the Superfund Site.

Last, we would appreciate the chance to have a short opportunity to review the report again before it is issued to the public. If you have any questions, please feel free to call me at 617-918-1273.

Sincerely,

Anni Loughlin
Project Manager

Attachment

cc: Mary Jane O'Donnell, Chief, ME/VT/CT Superfund Section
John Kilborn, Senior Enforcement Counsel
Martin Beskind, CT DEP

Attachment A
Comments on Fuss & O'Neill's Draft Environmental Impact Evaluation, Durham Water System Extension, dated May 2009

Section 1.2, Summary of Environmental Review, Page iii

1. The third paragraph of this section states the proposed water distribution system provides potable water to a "Core Area scenario" that includes the Superfund Site (Area A) and Areas B, C, and D, as well as the provision of fire protection. This report, along with the Draft Feasibility Study Update, should clearly outline a minimum base water system extension that only provides potable water to the Superfund Site and no other areas, including looping of the water system as appropriate to only service the Superfund Site.

EPA does note that Figures ES-2, ES-3, and ES-4 all include a notation regarding a "Proposed Water Service Area" or "Recommended Water Service Area" that only seems to point to the Superfund Site (Area A).

Section 2.1, Purpose, Page 1

2. The second paragraph states that the purpose of the proposed water main extension is to provide potable water to the Durham Center Area, as well as improved fire protection. This section should clarify that a minimum base system would provide potable water to the Superfund Site, and that expansion of the system would provide potable water and possibly fire protection to added areas.

Section 2.2, Need, Pages 1-2

3. As currently worded, the first paragraph is not correct. The Superfund Site was not designated at the time of the Record of Decision, nor does the Superfund Site address groundwater contamination from unaffiliated sources. The first paragraph should be replaced with the following language:

> "The need for the water main extension is due to groundwater contamination from various activities that have impacted existing groundwater supply wells. Certain of the wells in the study area are part of the Durham Meadows Superfund Site. As outlined in a Record of Decision issued by the United States Environmental Protection Agency (USEPA) in September 2005, USEPA's selected remedy for the site-wide area of groundwater contamination at the Durham Meadows Superfund Site is an extension of the Middletown Water Distribution System from the City of Middletown to all residences currently affected by groundwater contamination and a buffer zone of residences located near the contaminated area."

4. The last paragraph in this section references a letter from the USEPA to the Town of Durham in Appendix E. This letter is currently bundled with a number of other letters relaying comments on the notice of water line scoping and the EIE. EPA suggests renaming Appendix E in the Table of Contents to "Comment Letters Regarding the Scope of Work of the Environmental Impact Evaluation and Water Main Extension Feasibility Study Update," and including all comment letters in Appendix E.

Section 2.2.1, Durham Meadows Superfund Site (Area A), Page 2

5. As with the Draft Feasibility Study Update, the second paragraph in this section incorrectly states that approximately 85 properties in this area are contaminated. See comment #8 in EPA's May 11, 2009 letter regarding Fuss & O'Neill's Draft *Durham Water System Extension Feasibility Study Update* (the "Draft Report"), dated April 2009.

Section 2.2.2, Additional Problem Areas, Page 3

6. The first sentence of the second bullet on page 3 states, "Public schools are not within, but are adjacent to the Superfund Site (Area A)..." which is incorrect. EPA suggests replacing the first line of this bullet with the following language from the Draft Feasibility Report:

> "This area includes the Coginchaug Regional High School, the Korn Elementary School and the Frank W. Strong Middle School. The schools are located on Pickett Lane and lie just to the east of the Durham Manufacturing facility."

The remainder of the Area E bullet is fine as written.

Section 4.1, Discussion of Alternatives, No Action, Page 6

7. This section states that without any action to mitigate the pollution source, the ongoing pollution will continue to threaten the public health and degradation of the environment will increase with time. This language seems to imply that the provision of public water will result in a cleanup of groundwater contamination, which is not correct. EPA suggests instead using language stating that a No Action alternative does not provide a long-term effective and permanent solution to address residual risks from contaminated groundwater.

Section 4.3, Use of the Durham Fairgrounds Wells (Water Main Extension), Page 7

8. The first sentence on page 7 should be corrected to reference "...the boundary of the Superfund Site Technical Impracticability Zone as described in USEPA's Record of Decision..." EPA also suggests adding language in this paragraph clarifying that the Technical Impracticability Zone generally defines the limits of the proposed water service area for the Durham Meadows Superfund Site.

The rest of this section is fine as written.

Section 5, Recommended Scenario – Extension of Water, Page 8

9. The first paragraph states that the "recommended water distribution system that should be implemented is the Core Service Area Scenario as described above and shown on Figure ES-4." EPA notes that Section 3 seems to state that the initial service area is the Superfund Site, with the Core Area including the Superfund Site (Area A) as well as Areas B, C and D. The Core Service Area is described beginning on page 4 in section 3.3. Section 5 only recommends service to the Core Service Area without segregating the Superfund Site area.

Clarification is needed to differentiate the "initial service area" and the "Core Service Area." Each section should also clarify that a minimum base system would provide potable water to the

Superfund Site, and that expansion of the system would provide potable water and possibly fire protection to added areas.

10. This section states that fire protection "should be provided as part of the initial water system," and that the project could be constructed in phases as funding and monies become available "if the Town cannot obtain enough funding to implement the complete water distribution system with fire protection to all areas in the study." As previously outlined in comment #21 in EPA's May 11, 2009 letter regarding Fuss & O'Neill's Draft *Durham Water System Extension Feasibility Study Update* (the "Draft Report"), dated April 2009, if USEPA becomes the sole source of funding for this project, USEPA's authority is limited only to providing potable water to the Superfund Site area. Any funding available would only be provided to the Superfund Site and only to provide potable water. No funding could be provided for fire protection or to address any other contaminated areas outside of the Superfund Site. This section should explain this as a possible scenario.

11. The third paragraph in this section states that service connections would only be provided for the 83 properties in the Superfund Site Area with groundwater contamination problems. As previously discussed, the number of contaminated wells is incorrect, and is estimated to be approximately 38. Further, as previously stated in EPA's May 11, 2009 comment letter, service connections to all properties within Area A will be required, regardless of groundwater contamination. EPA's Record of Decision anticipates a water line connection to all homes within the technical impracticability zone, including residences currently affected by groundwater contamination and a buffer zone of residences located near the contaminated area.

Section 6.9, Public Utility Services Impacts, Page 11

12. This section states that the extension of water from the City of Middletown would "eliminate the contamination in the Superfund Site area as well as the other areas..." This language seems to imply that the provision of public water will result in a cleanup of groundwater contamination, which is not correct. EPA suggests merely stating that the extension would provide a long-term effective and permanent solution to address residual risks from contaminated groundwater.

Section 6.10.3, Statewide Plan of Conservation and Development, Page 13

13. Suggest modifying the third sentence in the last paragraph on page 13 as follows:

> "The proposed water mains are to eliminate usage of contaminated groundwater and wells and potentially provide fire protection for existing residential and commercial development..."

Section 6.12.5, Water Quality Classifications, Page 15

14. Suggest modifying the last paragraph in this section as follows:

> "Water extension from Middletown's existing water system will improve drinking water quality for the Superfund Site Area and potentially in the other contaminated areas within the Core Area."

Section 6.13, Indirect Impacts, Page 15

15. After the second paragraph, suggest adding the line, "After the construction of a water supply system to the Superfund Site area, USEPA will implement a monitoring network in order to monitor plume migration and ensure the plume does not migrate beyond the limits of the Technical Impracticability zone as defined in USEPA's Record of Decision."

Figure 2-1

16. This figure should carry over any corrections resulting from comments on the Draft Feasibility Study Update. (This figure indicates locations within the Superfund Site that are wells fitted with carbon filters, as well as certain other wells that are merely indicated to be "wells contaminated." EPA believes that only wells fitted with carbon filters should be designated as "contaminated." It is unclear why certain other wells without filters were designated as contaminated, and what information Fuss & O'Neill relied on to make this determination.)

End of comments.

FEASIBILTY STUDY FOR EXTENSION OF PUBLIC WATER FROM MIDDLETOWN TO DURHAM: COMMENTS ON DRAFT MIDDLETOWN SECTION DATED 6-26-09

General Comments

a. Move the paragraph titled "Available Water Supply in Middletown" (second paragraph from bottom of page 2 to the top of page 1). Place this paragraph under the heading, "Middletown Water System".

b. Consider reorganization of the text to aid comprehension by readers who are unfamiliar with such evaluations. Suggested sections are: Water Demand, Water Supply, Available Water for Durham, Conclusions, and Recommendations. Place the detailed discussion on Ultra-filtration in an Appendix.

c. Consider modifications to Table XX including deletion of the Laurel Brook Reservoir and Kleen Energy supplies in 2020. The addition of Wells 1A and 3A, and possibly of a small contribution of 0.50 MGD from a continuous Cromwell interconnection (if judged to be reasonably feasible), would begin in 2014. Since very little preliminary work has been done to prepare for implementation of the Kleen Energy wells and of reactivation of Laurel Brook as sources of supply of potable water, it would be best not to give the impression that there is a schedule to activate these sources at certain dates in the future. These potential sources along with others are included in the discussion of potential supply sources. Consider deletion of all information for 2050 – leaving predictions for that distant date to be developed in the next edition of the Middletown Water Supply Plan. See comments on Table XX below.

d. Define "Maximum Month Average Daily Demand" (MMADD) and explain that MMADD is the key parameter used as a measure of water usage.

e. Define "Safe Yield" and "Available Water". Note that the quantity of available water is based on 18 hours of pumping, as required in the Public Health Code (Section _____).

f. Define "Margin of Safety" (MOS). Note that DPH prefers a MOS of 1.15 – but has indicated that it has accepted lower values. It might be helpful to review this matter with DPH. In any event, an MOS of 1.15 is not a "threshold" value. The MOS applies both to Middletown and Durham public water systems.

g. Availability of water for Durham is inconsistently addressed at several points in the report. The available water to serve Durham is the quantity of available water in excess of the targeted MOS in Middletown.

h. Stress that future demand and supply estimates may be revised in the next Water Supply Plan – and that active evaluation is needed to determine which of the sources are more feasible than others.

i. Where possible, include a preliminary estimate of the range of costs for various sources.

Detailed Comments

1. GROUNDWATER SUPPLIES (page 1): At the end of the first paragraph of this section (after ".....and well No. 9 and well no.10 were constructed in 1995."), insert a sentence saying that Wells 1 and 3 are inactive (available for emergency use).

2. GROUNDWATER SUPPLIES (page 1): At the end of the third paragraph in this section, add a sentence stating that DPH had required a pump test of simultaneous operation of these wells by the end of 2009 – and note that the test remains to be done.

3. LAUREL BROOK RESERVOIR (bottom of page 1): Eliminate the second sentence ("A former treatment and pumping facility.....

4. LAUREL BROOK RESERVOIR (top line of page 2): Amend the sentence to read, "It could only used ***as a continuous source of potable water if*** treatment ***facilities*** including filtration ***are*** added."

5. EXISTING INTERCONNECTIONS AND PROPOSED INTERCONNECTIONS (page 2): These sections may best be deleted here. The existing interconnections are not of any particular interest as sources of continuous supply – they are allowed for emergency use only and would appear to have been never or infrequently used. Discussion of proposed interconnections belongs later in the report. With these deletions, the report would then move from the opening descriptions of the groundwater and surface water supplies to a new sub-section titled CURRENT WATER DEMAND.

6. CURRENT WATER DEMAND: Add a short section (to follow "Surface Water Supplies" section) discussing the water usage in Middletown since release of the initial draft of the 2004 Water Supply Plan. Add a note that the growth in water usage has been much slower 2004 than predicted. Maximum Month Average Daily Demand in 2009 is reported here as 5.50 MGD (based on data for the 2004 – 2008 period) as compared to 6.42 MGD predicted in Middletown's 2004 Water Supply Plan i.e. 5.25MGD.

7. FUTURE WATER DEMAND: Add a short section explaining that future water demands – as depicted in Table XX – is based on the predictions incorporated in the DPH-approved 2004 Middletown Water Supply Plan. In particular, the demand in 2020 is taken as 7.20 MGD and the demand in 2050 is assumed to be 8.63 MGD. Note that these future demands may be revised in the next Water Supply Plan due in 2010. Based on recent history of very slow growth in water usage over the past decade (1999 through 2008), it is likely that the predictions of future water demand in Middletown will be lower.

8. AVAILABLE WATER SUPLY IN MIDDLETOWN (second paragraph from bottom of page 2): Move this paragraph to the top of page 2 (see first general comment above).

9. TABLE XX (transmitted separately). First, insert a note that available groundwater supply from the River Road well field, while based on quantities shown in table VII-7 of the 2004 WSP, were modified to exclude any contribution from inactive wells 1 and 3, and are based on 18 hour per day operation. (Supply quantities in Table VII-7 are based on 24 hour per day pumping.)

10. Table XX must be understandable by the lay public and legislators. Suggestions for clarifying the table follow: (i) Title, 3rd line: Consider modifying to read, "Based on 2004 Water Supply Plan with revisions to show recent usage and revisions to available supply required by DEP and DPH". (ii) Heading: Remove "Information from Table VII-7/WSP, and add a first note indicating that the table is based on Table VII-7 in the 2004 Water Supply Plan with modifications (in gray shaded boxes) to reflect more recent usage data, revised demand projections for 2014 and adjustments to groundwater supply from Wells 1 and 3 and from Cromwell. (iii) Headings: Remove "Existing" so that the first two columns read, "Water Usage 1999-2003, MGD" and "Water Usage 2004-2008, MGD". (iv) Define the terms: average daily demand, maximum month average day demand (noting that this value is used to determine adequacy of supply), total available water, average daily supply, maximum month average day supply, peak day supply (noting that deficits can be overcome by providing adequate storage), and margin of safety (MOS, noting that DPH recommends a value of 1.15, but will consider lower margins in special cases. See also (xiii) below. (v) Revise the description on the second line of "Groundwater Source of Supply" to read "Groundwater Sources of Supply", adding an asterisk or number referring to a general note to read, "Based on 18 hours of production as required by the Public Health Code (cite section here)" or similar note. This note should replace the existing first note below the table. (vi) Revise the first description under Groundwater Sources of Supply to read, "Currently Available Supply from Wells 2, 4, 5, 6, 7, 8, 9 and 10", or similar. (vii) Revise the second description under Groundwater Sources to read, "Potential Future Supply from Replacement Wells 1A and 3A", or similar. (viii) Revise the third description under groundwater sources to read, "Potential Future Supply from Kleen Energy Radial Collector Wells", or similar (if Kleen Energy entry on the Table remains. See General Comment c. (ix) Revise the fourth description under groundwater sources to read, "Potential Future Supply from Cromwell Interconnection", or similar. (In discussion below, a suggestion is made to include allowance for increased supply to 3 MGD in 2020 and beyond.) Revise the heading, "Surface Water - Available Water", to read, "Currently Available Water from Higbie Reservoirs", or similar. Revise the description, "Laurel Brook Reservoir Activation", to read, "Potential Future Supply from Laurel Brook Reservoir", or similar, if this entry remains on the Table. (x) Add a row at the bottom to reflect water available (if any) for Durham, after allowing an adequate margin of safety for Middletown and

for Durham. (xi) Add a row at the bottom of the table reading "excess water available for Durham" or similar. (xii) Add a note explaining how maximum monthly average day demand and peak day demand are estimated based on average day demand future projections. (xiii) Highlight (in bold) the row "Maximum Month Average Day Demand".

11. AVAILABLE WATER (bottom of page 2): Comments on the bottom paragraph are as follows: (a) At the beginning of the first sentence, insert ***The first two columns of*** Table XX summarize..... (b) In the fifth line of this paragraph, replace "maximum month average day supply" with "total available water". (c) The third and fourth (last) sentence in this paragraph draw the conclusion that based on 2009 demand and available supply (as shown in the second column of Table XX); there is sufficient water to service the "core area" in Durham. This is not the case. The excess supply provides a 1.16 margin of safety (MOS) for serving Middletown demands alone- virtually equal to DPH recommended value of 1.15 (i.e. the available supply should be 15% greater than the demand). Additional water must be made available in order to supply water to Durham. For example, in order to provide the "core area" in Durham with potable water (without fire protection), the Middletown supply would need to be increased by 1.15 x 0.3 MGD = 0.345 MGD (see Table 3-3 for a listing of demands in Durham) to serve the core area in Durham and maintain a 15% MOS. In order to supply the core area in Durham with both potable water and fire protection, the Middletown supply would need to be increased by 1.15 X 0.781 MGD = 0.898 MGD.

12. POTENTIAL SOURCES OF SUPPLY (top of page 3): Insert, "There are several potential sources of additional water supply for the Middletown Public Water System", or similar language. Continue with, "These are discussed briefly in the following paragraphs." Condense the discussions of these various potential alternatives as currently presented on pages 3 through the top of page 10. Additional details should be placed in an Appendix to the report. See handwritten notes on the marked-up copy of the text.

13. Discussion of 2014 Projections (page 3): Delete this as a separate section. Include observations in Discussion of Available Supplies on Page 10.

14. Wells 1 and 3 Improvements (page 3) Indicate that Plans for replacement of Wells 1 and 3 should be designed as early as possible.

15. Cromwell Interconnection (page 4 bottom and page 5 top): Consider placing details of Well 4 improvements to an appendix (along with details of Ultrafiltration for the Laurel Brook Reservoir). Retain the lead in sentence, "Well field improvements would include ***activating*** Gardner Well No. 4." Move that sentence to the end of the first paragraph of the Cromwell Interconnection.

16. Discussion of 2020 Projections (page 5): Delete as a separate section. In the "Discussion of Available Supplies" on page 10, include a new set of observations with regard to possible strategies to satisfy projected demands of Middletown and Durham.

17. Kleen Energy Radial Collector Wells (page 6) Delete the last paragraph; include pertinent discussion of possible ways to meet Middletown and Durham water needs in Discussion of Available Supplies on p. 10.

18. Laurel Brook Reservoir (page 7) Move the description of the Ultrafiltration system on p. 7 and the top paragraph on page 8 to the Appendix.

19. Laurel Brook Reservoir (page 8) Move discussion of the potential water available to supply Durham to the Discussion of Available Supplies on page 10. Be sure that water supply to Durham is that quantity of water in excess of 1.15 X Middletown's demand. Allow of 15% MOS for Durham.

20. Discussion of 2050 Projections (page 8): Delete. Include pertinent remarks in Discussion on page 10.

21. OTHER POTENTIAL SOURCES Delete this title and the paragraph following the title.

22. DISCUSSION OF AVAILABLE SUPPLIES: (Page 9) the following observations should be included:

(a) Summarize the status of development of alternative additional potential sources. Indicate that all potential sources require some further evaluation and effort to determine desirability and feasibility of implementation. For the purpose of this report, indicate where most effort might be properly directed i.e. which alternatives should be given most effort for the next five to ten years.

(b) Despite the uncertainty of the quantities of future water usage and future supplies in Middletown, it is safe to state that extension of public water from Durham to Middletown will require a corresponding increase in Middletown's supply beyond any increase needed within Middletown to accommodate growth in demand. For example, in order to supply the "core area" of Durham consisting of the Superfund, Gasoline, 1,1 DCE and Parsons areas with both potable water and fire protection, approximately 0.9 MGD would be needed to meet the projected demand and maintain a 15% margin of safety i.e. 115% of the 0.781 MGD shown in Table 3-3 (1.15 X 0.781 = 0.898 MGD). This approach is considered more appropriate than categorically stating that available water in the near term would only suffice to supply potable water to the Superfund area. The status of potential sources is too undefined to rely on one particular scenario.

(c) Include an allowance for the cost of supplying the needed additional water for Durham in the cost estimate (such allowance might be based on a preliminary cost estimate of implementing an interconnection with Cromwell, including the cost to activate and integrate Well No. 4). Be sure to consider what portion of the cost should be included in the cost of the Durham system (i.e. if Middletown needs part of the increased supply to meet its own needs, the City might bear a portion of the cost.)

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

May 12, 2009

Ms. Fereshteh Doost, P.E.
Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040

Subject: Revised DPH Review: Durham Water System Extension Feasibility Study

Dear Ms. Doost:

The revised DPH Drinking Water Section (DWS) comments in response to your April 2009 report and subsequent addendum received on May 7th are listed below. These comments are based on available information from Middletown Water Department's (MWD) 2004 water supply plan (WSP) and a 2008 sanitary survey of the Middletown Water Department.

1) The following comments relate to the addendum provided by Fuss & O'Neill on MWD's current ability to provide sufficient water supply to meet expected demands:

- DPH records indicate that MWD's total available water for all sources, agreed upon by DPH and MWD, in the MWD 2004 approved water supply plan was 7.0 MGD. The 7.0 MGD total results from a summation of the 1.22 MGD safe yield for Mount Higby Reservoir and 75% (18 hour pumping day) of the current pumping capacities of all well water sources, including Wells#1 and #3, which resulted in a well water contribution of 5.78 MGD. This mutual understanding was a result of a December 12, 2005 meeting between MWD and DPH. Both parties agreed further testing and verification was necessary to determine actual safe yield of Middletown's current supplies.
- Considering Wells#1 and #3 have still yet to be developed, the total available water of 7.0 MGD from the approved 2004 water supply plan is further reduced to 6.36 MGD for the current situation.
- MWD committed on p. III-13 of their 2004 Water Supply Plan to conduct a simultaneous wellfield pump test in accordance with the water supply plan regulations over the short term improvement period (2004-2009). The pump test was to become the basis for MWD's water supply planning purposes and future regulatory approvals such as increasing safe yield and amending DEP diversion permits. The results from performing such a test should be provided to DEP and DPH and used as a critical portion of this review. If the test has yet to be conducted, it should be scheduled and conducted this year.
- The supply/demand scenarios presented by Fuss & O'Neill should only reflect currently DPH approved MWD active sources of supply which have approved DEP diversion permits. The supply/demand data should be presented in relation to Average Day Demands, Maximum Month Average Day Demands, and Peak Day Demands. The critical number is the Maximum Month Average Day Demand as this is the increased demand number that must be met over a sustained period of time with an adequate Margin of Safety (MOS).

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P.O. Box 340308 Hartford, CT 06134

- Fuss & O'Neill indicates in the addendum provided on May 7, 2009 that "Middletown appears to have enough excess supply available to meet the demands for the proposed interconnections with the Town of Durham". Given DPH's recent comments regarding available water in Middletown, please provide the calculations and basis for the suggestion that Middletown has the apparent excess supply to meet the demands for the proposed interconnection with the Town of Durham.

2) The section on current and future proposed interconnections with other public water systems should be updated with the most current status of each interconnection including the status of DPH Sale of Excess (SEW) water permits and DEP diversion permits.

3) Alternative options to supply Durham with water supply should also be investigated as part of this study. Please provide an update on viable alternative options.

If you have any further questions, please do not hesitate to contact me.

Sincerely,

Lori Mathieu
Public Health Services Manager
Drinking Water Section

cc: Anni Loughlin, EPA, One Congress Street, Suite 1100 (HBT), Boston, MA 02114-2023
Mr. Martin Beskind, CTDEP
William Milardo, Town of Durham, 30 Town House Road, Durham, Connecticut 06422
Guy Russo, Middletown Water Department, 82 Berlin Street, Middletown, CT 06457

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ONE CONGRESS STREET, SUITE 1100
BOSTON, MA 02114-2023

May 11, 2009

Fereshteh Doost
Fuss & O'Neill
146 Hartford Road
Manchester, CT 06040

Re: EPA Review of Draft Fuss & O'Neill *Durham Water System Extension Feasibility Study Update*, dated April 2009

Dear Ms. Doost:

The United States Environmental Protection Agency (EPA) has reviewed Fuss & O'Neill's Draft *Durham Water System Extension Feasibility Study Update* (the "Draft Report"), dated April 2009.

EPA's comments are included as Attachment A. Given the expertise that other entities reviewing the Draft Report have regarding design and construction of water lines, EPA's review focused mostly on the scope of the water line, especially as it relates to the Durham Meadows Superfund Site area.

In general, corrections are needed to the text describing the Durham Meadows Superfund Site, especially with regard to the number of contaminated wells within the Superfund site. An incorrect count of contaminated wells continues throughout the report and requires correction. This may also impact totals used in Fuss & O'Neill's calculations throughout the report.

Further, EPA generally defers to comments by the Connecticut Department of Environmental Protection (CT DEP) regarding the number of potable wells and the number of wells currently being filtered and monitored pursuant to State Orders. Fuss & O'Neill should contact EPA and CT DEP for clarification and resolution if the agencies provide separate comments that appear to conflict with each other.

We would appreciate the chance to have a short opportunity to review the report again before it is issued to the public. If you have any questions, please feel free to call me at 617-918-1273.

Sincerely,

Anni Loughlin
Project Manager

Attachment

cc: Mary Jane O'Donnell, Chief, ME/VT/CT Superfund Section
John Kilborn, Senior Enforcement Counsel
Martin Beskind, CT DEP

Attachment A
Comments on Fuss & O'Neill's Draft Durham Water System Extension Feasibility Study Update, dated April 2009

Section 1.3, Existing Water Systems, Pages 3-4

1. It would be helpful if this section included a brief explanation of what defines non-transient community systems and non-transient non-community water systems.

Section 1.4.1, Durham Meadows Superfund Site (Area A), "History of Durham and Merriam Manufacturing Site Activities"

2. Remove the quotation mark at the beginning of this section's first paragraph on page 5.

3. The MMC acronym established for Merriam Manufacturing Company on page 5 should be carried forward onto page 6 (see instances of "Merriam" in the first line, and throughout the third full paragraph).

Section 1.4.1, Durham Meadows Superfund Site (Area A), "Action Taken"

4. In the first paragraph of this section on page 7, delete the last two sentences, "As a result, limited soil clean up was undertaken at both companies. The volatile organic compounds had however already reached sources of potable water supply." The statement regarding soil cleanup is not correct.

5. In the second paragraph of this section on page 7, correct the fourth sentence as follows:

> "MMC ~~MCC~~ was responsible for servicing 24 of these wells, but ~~the company ceased business activities in late 2004~~ ceased this activity and CTDEP has since taken over monitoring and maintenance of these locations."

(EPA defers to any suggested language changes by CTDEP for this section.)

6. EPA suggests deleting the 5th paragraph in this section regarding Removal Program activities as this provides no relevant information and is confusing in the current location.

7. It is unclear what the 6th paragraph in this section is referring to, and EPA suggests rewording this paragraph as follows:

> "The highest concentrations of VOCs have traditionally been detected at MMC, DMC, the Strong School well formerly located at 191 Main Street, and the residences at 168 Main Street and 174 Main Street."

8. The last paragraph on page 7 states that the Superfund Site area (Area A) includes approximately 110 properties of which approximately 85 are contaminated. This is incorrect.

EPA's Record of Decision (ROD) selected a remedy that includes a water line that would be connected to <u>all</u> homes located within the Technical Impracticability Waiver Zone for the Site-Wide Groundwater Study Area of the Superfund Site, as outlined on Figure 8 of the ROD. (This figure was provided to Fuss & O'Neill in October 2008, and generally matches with this report's "Area

A," with the exception of the Strong School at 191 Main Street which has been incorporated in "Area E" of the Fuss & O'Neill report.) The technical impracticability zone encompasses all areas in the overburden and bedrock aquifers that are currently or conceivably could be impacted by contamination emanating from the Superfund Site. The ROD anticipates a water line connection to all homes within this zone, including residences currently affected by groundwater contamination and a buffer zone of residences located near the contaminated area; it is EPA's understanding, therefore, that all potable wells within "Area A" shall be provided with a full water service connection. At the time of the ROD, EPA estimated there were 85 wells in total within this zone, only approximately 38 of which were contaminated.

Further, the number of wells listed as "contaminated" within this area should be corrected and confirmed with CT DEP. EPA notes that, while there may only be approximately 38 wells currently filtered and monitored due to Superfund Site contamination, Area A includes a number of wells at the northern end of Main Street that are contaminated with MTBE by gas stations within Area B.

Inaccurate counts of contaminated wells within Area A likely impact other presentations throughout the report, including text, figures, and cost projections.

Section 1.4.2, MTBE Site, Petroleum Pollution on Main Street (Area B)

9. The text should make a note of the fact that certain wells impacted by MTBE are currently located in Area A. EPA is not suggesting any change to the boundary between Areas A and B.

Section 1.4.9, Durham Center (Area I), Page 11

10. The first sentence of the first full paragraph on page 11 can be modified to read, "USEPA and CTDEP are concerned that the Ball Brook Fault...."

11. The last sentence of the second full paragraph on page 11 should be changed from, "Additional wells will be installed as part of the final Superfund remedy," to instead read as follows:

> "After the construction of a water supply system to the Superfund Site area, USEPA will implement a monitoring network in order to monitor plume migration and ensure the plume does not migrate beyond the limits of the Technical Impracticability zone as defined in USEPA's Record of Decision."

Section 2.1, Scenarios Developed, Page 12

12. The last paragraph in this section states that service connections would be installed to properties where well contamination was found, but only brought to the property line for the other lots within any site. This concept needs to be revisited for the Superfund Site (Area A) and the text of the report revised wherever it is presented (e.g., text in Section 2.3). As noted in a previous comment, not all of the wells within this Area are contaminated, yet service connections to all properties within Area A will be required.

Section 3.1, Water Demands, Areas A to H, Page 14

13. Please define "ADD" the first time it's mentioned in the text.

Section 4.6, System Layout, Page 20

14. On page 20, bullet number 4 states that service connections will be installed to the home "for each of the 85 properties that have had documented potable water well contamination from the Durham Meadows Superfund site." As previously noted, not all of the wells within the Superfund Site area are contaminated. The text should be revised.

Section 6.1.1, Project Costs, Assumptions, Page 25

15. Bullet number 6 states that a total of 85 existing potable water supply wells in the Superfund Site area have been impacted in the past or are presently impacted. As previously discussed, this is incorrect, and the text needs to be revised. Please also capitalize the word, "Superfund."

16. Bullet number 6 should also clarify that all well locations to be connected to water service will require well abandonment. Fuss & O'Neill should consider the fact that certain homes and structures within the Superfund Site area share potable wells, and explain how these will be addressed in any water main connection. (For example, it is EPA's understanding that the well at the church located at 236 Main Street also serves the structures located at 228 Main Street and 228R Main Street.)

Section 6.4.1, Opinions of Capital Cost, Superfund Site, Page 26

17. This section states, "The Superfund Site Area's distribution system is shown on Figure 4-1 without fire protection." What Figure 4-1 actually shows is a potable water distribution system for multiple areas, not just the Superfund Site. It is EPA's understanding that a possible future scenario is one in which potable water service is only provided to the Superfund Site and no other areas. Therefore, this report should provide a figure that only shows a water distribution system that provides potable water to the Superfund Site and no other areas, including looping of the water distribution system as appropriate to only service the Superfund Site.

18. The last paragraph which begins on page 26 and continues onto page 27, states that the water distribution system would be installed to serve only the properties in the Superfund site that presently have groundwater contamination or have had contamination in the past, and goes on to state that 85 properties with past/present documented contamination will be provided with complete water service connections to the buildings. As previously noted, this is incorrect and this section and all associated figures and tables must be corrected.

19. The first full paragraph on page 27 discusses presentation of the Superfund Site area's distribution system with fire protection as shown on Figure 4-2. As with the above comments, Figure 4-2 shows a distribution system for multiple areas, not just the Superfund Site. A separate figure providing a water distribution system including fire protection to just the Superfund Site should be provided as a separate figure.

Section 6.4.1, Opinions of Capital Cost, Page 27

20. The last paragraph on page 27 references Tables 6-13 and 6-14. These tables are not provided in Fuss & O'Neill's report, nor are these tables listed in the Table of Contents.

Section 7.5, Funding, United States Environmental Protection Agency (USEPA), Pages 29-30

21. The two paragraphs of this section should be deleted and replaced with the following language:

> "The USEPA has completed a Remedial Investigation of the Durham Meadows Superfund site and a Record of Decision was issued in September 2005. The Record of Decision discussed the findings of the Remedial Investigation and selected USEPA's preferred solution for the Site-Wide Groundwater Study Area as an extension of the water main from the City of Middletown.
>
> The USEPA will continue to participate in efforts related to resolving all potable water well contamination in the area, however, the USEPA's authority is limited only to providing potable water to the Superfund Site area. If no funding is available to construct the water distribution system, the USEPA would first negotiate with Superfund Site responsible parties to finance this effort. If the responsible parties are unable to participate in funding this work, the USEPA Region I may request Superfund financing for this work, however, there are no guarantees that finances would be readily available in any given year. Regardless of whether responsible parties or the USEPA provide funding, in this scenario, funding would only be provided to the Superfund Site and only to provide potable water. No funding could be provided for fire protection or to address any other contaminated areas outside of the Superfund Site."

Section 7.8, Potentially Responsible Parties on Route 17, Page 30

22. EPA recommends this section be re-titled to "Entities Located on Route 17," and the entire section's text deleted and replaced as follows:

> "There are several entities located on Route 17 that have contributed to groundwater contamination in the town. These entities may be a potential source of funding for the extension of the existing Middletown water system into the Durham area.
>
> Within the Durham Meadows Superfund Site, potentially responsible parties include the Durham Manufacturing Company, the Merriam Manufacturing Company, and the Estate of Allan Adams. The USEPA would address any potential contributions from these parties.
>
> Other entities that may have contributed to groundwater contamination outside of the Superfund Site include three gas stations as outlined in Section 1.4.2. Contribution from these parties would be addressed through CTDEP."

(EPA defers to CT DEP comments regarding contribution from the gas stations.)

Section 9, Summary and Recommended Plan, Pages 32-33

23. The last paragraph on page 32 must be revised to correct the statement that only properties with Superfund Site well contamination will receive service connections all the way to the buildings.

24. The second sentence in the second full paragraph on page 33 (statement regarding the USEPA's funding intent) should be deleted and replaced with the following language:

> "If funding is not available to construct the water distribution system, the USEPA would first negotiate with Superfund Site responsible parties to finance this effort. If the responsible parties are unable to participate in funding this work, the USEPA Region I may request Superfund financing for this work. Funding in this scenario, however, would only be for provision of potable water to the Superfund Site. No funding could be provided for fire protection or to address any other contaminated areas outside of the Superfund Site."

(As a note to Fuss & O'Neill, EPA has already recommended the water line extension from the City of Middletown in its Record of Decision as the preferred remedy to address the Site-Wide Groundwater Study Area at the Durham Meadows Superfund Site. No further recommendation on this issue is needed, until and unless it is determined that connection to the City of Middletown Water Distribution System cannot be implemented for administrative or other reasons, or cannot be implemented in a timely manner.)

25. The fourth full paragraph on page 33 should be revised to correct the statement that service connections will only be provided for the properties in the Superfund Site area with groundwater contamination problems. The last sentence in this paragraph, regarding sizing water mains for fire protection, should be reworded to indicate that this is Fuss & O'Neill's recommendation, and not a forgone conclusion.

Figure 1-3

26. This figure includes the existing water system, "Old Indian Trail," but this system isn't mentioned in the text of section 1.3.

Figure 1-4

27. The text on page 3 refers to this figure for the Durham Center Water System Layout. This is not clear from the figure, nor is it clear exactly what is shown on this figure and why. For example, what are all the different colored lots meant to represent? Adding a description and a legend to this figure may help to clarify these issues.

Figure 1-6

28. This figure indicates locations within the Superfund Site (Area A) that are wells fitted with carbon filters, as well as certain wells that are merely indicated to be "wells contaminated." EPA believes that only wells fitted with carbon filters should be designated as "contaminated." It is unclear why certain other wells without filters were designated as contaminated (but presumably without filters), and what information Fuss & O'Neill relied on to make this determination.

Table 1-1

29. Please clarify the "(2)" designation for some of the multi-family homes. For example, in Area A, what appears to be two three-family homes are presented on separate lines as "1 Three Family" and "1 (2) Three Family."

30. Certain of the Areas include a total count for residential homes while others do not. The counts should be presented consistently for each Area to avoid confusion.

Table 3-2, Superfund Site, Commercial Buildings, Page 1

31. It is unclear how Fuss & O'Neill determined the number of people and/or the water demand for each commercial building. This is especially noticeable when comparing information for the Church of the Epiphany at 196 Main Street with information for the Notre Dame Church at 280 Main Street. This table provides only water demand figures for the Church of the Epiphany, and no figures for square footage or number of people. For the Notre Dame Church, no square footage is provided, but the table presents a breakdown of the number of people for each subcategory.

32. It is unclear how the average daily flow was calculated for the Durham Manufacturing Company (DMC). Do the assumptions only account for the amount of potable water that DMC will require, or do the assumptions also include the amount of non-potable water used by the company? Non-potable water is currently supplied by a dedicated cooling water well on the DMC property. This table or the associated text should provide clarifications on this matter. EPA defers to CT DEP for any further discussion as to whether or not a water main connection should supply DMC with non-potable water, but notes that if EPA solely funds this project, it will not provide funding for provision of non-potable water.

33. "Continental Fab" is listed for 281 Main Street. This should be corrected to, "Former Location of Merriam Manufacturing Co." (Note that "Continental Fabrication" was a small tenant at this location after the 1998 fire that consumed the bulk of the factory. Currently, there is no tenant at the property, and there will be no tenant in the foreseeable future.)

34. It is unclear how Fuss & O'Neill generated the information for the 281 Main Street location. The former factory burned to the ground, leaving only a small warehouse space which remains to this day. The parcels affiliated with the 281 Main Street location are currently in a state of quasi-abandonment and are not being used, however, EPA understands that current zoning regulations would allow any potential future owner to rebuild another light industry or commercial office building or use the property for residential purposes. Given that the future use of this property is unknown, EPA recommends that this table provide average daily flow and maximum daily flows that assume the highest possible water consumption use available. (Information regarding potential reuse of this property is outlined in Section F of EPA's Record of Decision for the Durham Meadows Superfund Site, however, Fuss & O'Neill should confirm any assumptions regarding this property with the Town of Durham.)

Tables 6-1a to 6-9a, Water Main Budgetary Opinion of Cost (Without Fire Protection), and Tables 6-1b to 6-9b, Water Main Budgetary Opinion of Cost (With Fire Protection)

35. On Table 6-1a item number 13, and Table 6-1b item number 15, it appears that costs were generated assuming only 85 service connections. As previously outlined, all potable wells within "Area A" shall be provided with a full water service connection. These tables should be modified to include these costs; any cost modifications should be incorporated into other tables and the text of the report as appropriate. Fuss & O'Neill should also consider the fact that certain homes and structures within this area share potable wells.

36. Tables 6-1a and Table 6-1b appear to be the only tables that include costs for potable well abandonment. It is unclear why this is the case. (For example, wouldn't contaminated wells within the MTBE plume require abandonment?)

End of comments.

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

May 06, 2009

Ms. Fereshteh Doost, P.E.
146 Hartford Road
Manchester, CT 06040

Subject: Review of the April 2009 Report on Durham Water System Extension Feasibility Study

Dear Ms. Doost:

Please find the DPH Drinking Water Section (DWS) comments in response to your April 2009 report listed below. These comments are based on available information from Middletown Water Department's (MWD) 2004 water supply plan (WSP) and a 2008 sanitary survey of the Middletown Water Department.

1) Considering the questions surrounding water availability to meet expected demands, Fuss & O'Neill must address the issues of current availability of water from Middletown in its April 2009 report on Durham Water System Extension Feasibility Study Update. There is no discussion of actual availability of water from Middletown in the Fuss & O'Neill report. This data should be presented in relation to Average Day Demands, Maximum Month Average Day Demands, and Peak Day Demands. The critical number is the Maximum Month Average Day Demand as this is the increased demand number that must be met over a sustained period of time with an adequate Margin of Safety (MOS).

2) MWD had committed on p. III-13 of their 2004 Water Supply Plan to conduct a simultaneous wellfield pump test in accordance with the water supply plan regulations over the short term improvement period (2004-2009). The pump test was to become the basis for MWD's water supply planning purposes and future regulatory approvals such as increased safe yield and amending DEP diversion permits. The results from performing such a test should be provided to DEP and DPH and used as a critical portion of this review. If the test has yet to be conducted, it should be scheduled and conducted this year.

3) Alternative options to supply Durham with water supply should also be investigated as part of this study. Please provide an update on including alternative options worthy of investigation.

If you have any further questions, please do not hesitate to contact me.

Sincerely,

Lori Mathieu
Public Health Services Manager
Drinking Water Section

cc: Anni Loughlin, EPA, One Congress Street, Suite 1100 (HBT), Boston, MA 02114-2023
Mr. Martin Beskind, CTDEP
William Milardo, Town of Durham, 30 Town House Road, Durham, Connecticut 06422
Guy Russo, Middletown Water Department, 82 Berlin Street, Middletown, CT 06457

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From: "William Milardo" <wmilardo@townofdurhamct.org>
To: "Kevin Flood" <KFlood@fando.com>
Date: 5/11/2009 9:24 AM
Subject: Study Review Comments

Page 1 Introduction - 1.2 1.G. Woodland Drive Area

Page 2 - 1.2 5. Compare Alternatives for Supply to the Durham Center System

Page 3 - 1.3 Existing water systems (see figure 1-3),transient non-community and

Page 3 - 1.3 1. The Durham Center Water System is currently operated

Page 3 - 1.3 2. The Durham Lexington Place System - This system, owned by the Town, is located

Page 3 - 1.3 3. The Durham Elderly Housing System at Mauro Meadows - This system, owned by the

Town, located off.... The system is supplied by on-site wells.

Page 4 numbering system under Non-Transient Non-Community Systems:

Page 7 bottom paragraph - The Superfund Site area (Area A) includes approximately 110 properties (92 are

residential, 9 are vacant and the remaining 9 properties include commercial, industrial

and municipal facilities) of which approximately 85 are contaminated.

Page 10 - 1.4.7 Woodland Drive Area (Area G) last sentence of 1st paragraph - replace enough with

adequate

Page 10 - 1.4.8 provide the title for Guy Russo

Page 11 - 1.4.10 1st sentence - ...identified in the Study completed in 2000.

Page 11 - 1.4.10 (a) - ....Durham/Middlefield Town line has polluted 9 individual potable water

- Add sentence: The system requires some upgrades per the CTDPH Drinking

Water Section.

Page 12 - 2.1 refer to last paragraph -
...other lots within any area.

Page 13 - 2.4 The water main would then loop
and be installed on Maiden Lane

Page 13 - 2.6 add Austin Road to the list.

- Easements from
existing property owners would need to be obtained...

Page 14 - 3.1 The following is the summary
of criteria used in developing...

- The average
daily demand (ADD) also includes...

Page 21 - 4.7 1st paragraph - Miller Road
should be Maple Avenue ?

Page 25 - 6.1 should the following be added
to the 10 items? Existing wells should be permanently

abandoned or well
caps should be welded to the casings.

Page 29 - 7.4 Therefore, Rural Development
will not provide the Town with grant money.