October 2004

UConn Update

Landfill Remediation Project

INTRODUCTION

The last step in the preparation for the closure of the UConn landfill and former chemical pits takes place this fall with final review of the project permits, which include:

- *Section 404 Individual Permit (U.S. Army Corps of Engineers)*
- *Inland Wetlands and Watercourses Permit and 401 Water Quality Certificate*
- *Flood Management Certification*
- *General Permits for Discharge of Groundwater Remediation Wastewater to a Sanitary Sewer (amendment to an existing permit)*
- *General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities*
- *Combined Permit for Disruption of a Solid Waste Closure Area, Landfill Closure, and Post-Closure Use*

The Connecticut Department of Environmental Protection (DEP) will announce a comment period on the wetland permits by the end of the year. The article below summarizes the final documents under review, including the Wetland Mitigation Plan, the Section 404 Individual Permit application to the Army Corps of Engineers and related permit applications to DEP.

UConn has contracted with O&G Industries of Torrington, CT, to act as Construction Manager for the closure construction. GZA GeoEnvironmental, Inc., will act as a subcontractor to provide environmental and geotechnical engineering services on the project.

UConn Submits Wetland Mitigation Plan to Complete Closure Planning

The University of Connecticut (UConn) submitted the *Wetland Mitigation Plan* for remediation of the UConn landfill and former chemical pits to the Connecticut Department of Environmental Protection (DEP) on June 30, 2004. DEP and the U.S. Army Corps of Engineers (ACOE) required the Wetland Mitigation Plan in connection with the proposed disruption of wetlands near the landfill and former chemical pits. The impacts – some temporary and some permanent – are detailed in the Individual Permit application filed with ACOE and the wetlands permit applications filed with DEP. DEP's Water Management and Inland Water Resources Division (IWRD) and the ACOE are completing their review of the document and permit applications. UConn, DEP and ACOE are working out the final details of the permits. When the review is complete, DEP will announce a 30-day comment period on the Wetland Mitigation Plan.

Permit Background

The remediation work in the study area will affect wetlands near the landfill and former chemical pits. Because of these impacts, UConn applied for permits from the state and federal agencies charged with protecting wetlands. The ACOE requires a Section 404 permit, and the DEP calls for a 401 Water Quality Certificate, Inland Wetlands and Watercourses Permit and Flood Management Certification before construction can begin.

The Wetland Mitigation Plan has three main components: (1) **restoration** measures, (2) **creation** of new wetlands and (3) **enhancement** of wetland habitats and

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WHAT IS THE UCONN LANDFILL PROJECT?

On June 26, 1998 the Department of Environmental Protection issued a Consent Order to the University of Connecticut. The order requires UConn to thoroughly evaluate the nature and extent of soil, surface water and groundwater pollution emanating from the University landfill, former chemical pits and an ash disposal site known as F Lot. The order also requires UConn to propose and implement remedial actions necessary to abate the pollution. The UConn Landfill Remediation Project is the process that UConn is undertaking to comply with the order.

Visit the UConn Landfill Project web site for copies of the project schedule, meeting announcements and other information.

www.landfillproject.uconn.edu

wetlands that will be disturbed by the construction. The plan summarizes the work and impacts and outlines alternatives considered for each wetlands area. The Mitigation Plan describes steps that will be taken to minimize impacts on other wetlands in the area. It includes recommendations for the construction method, plantings, management of **invasive species** and erosion controls. Finally, it outlines the monitoring that will take place over the next thirty years.

The landfill closure will result in the loss of 1.83 acres of wetland due to filling and post-closure uses. Another 2.97 acres of wetland will be disturbed temporarily by the removal of contaminated sediments and fill. Tables 1 through 3 of the Mitigation Plan list the sizes of the wetland areas and the type of mitigation proposed in the plan. The table on page 4 summarizes some of this information. In addition to restoring the wetlands, the plan proposes to enhance 12.4 acres of wetlands and preserve another 21 acres.

The Site Work

The landfill and former chemical pits are located in a valley that includes a drainage divide between tributaries of Eagleville Brook and Cedar Swamp Brook. In the past, some waste was placed outside the limits of the landfill, next to or within the wetland areas. Vegetation grew up over the waste and some contaminants leached into the wetlands to the north and south. Some of these wetland areas will be disturbed – but not lost – by activities such as removing contaminated sediments and waste and consolidating them on the landfill. Other wetland areas will be lost due to landfill regrading and construction of stormwater ponds and an access roadway. Sediment removal north and south of the landfill will impact the surrounding wetlands. In addition, capping the former chemical pits area will impinge on the southwest side of the Study Area. The map on page 4 shows the locations of the wetlands that will be lost, as well as the wetlands improvements planned in the Study Area.

As part of the remediation, the contractor will dig up the outlying waste and sediment, drain the water from it and put it on the landfill. As the **dewatering** takes place, water coming from the waste will be collected as needed and pumped to UConn's wastewater treatment facility. (The steps in the Closure Plan were described in detail in the April 2004 *Update*, which is available at www.landfillproject.uconn.edu.)

In addition to the wetlands restoration, the Mitigation Plan describes construction practices that will protect the remaining wetlands during the landfill closure activities. These include constructing soil berms and installing hay bales and silt fences to minimize erosion and prevent movement of silt in the wetland. Streams will be rerouted in the work areas temporarily while the waste excavation and sediment removal are in progress. Beaver dams will be removed to lower water levels and reduce the suspension and migration of silt and contaminants through the wetlands during remediation.

In an area where sediment will be removed, for example, the contractor will begin by installing erosion and sedimentation controls, including a temporary filter berm and stream diversion. Existing wetland trees will be cut down and vegetation will be stripped to gain access to the contaminated sediment. The contractor will remove the sediment from surveyed areas for placement on the landfill. Confirmation testing and removal of the sediments will take place until the cleanup goals of the closure plan are met. Soil and sediments will be removed from each area until the concentration of contaminants in sediment samples from the excavation perimeters meets ecological requirements.

Restoration Work

Restoration activities will include bringing in topsoil and new plantings. Wetland restoration will enhance the wetland type, functions and values to the maximum practical extent. In some places, the contractor will remove debris, bring in topsoil and reconstruct intermittent streams within the same area prior to disturbance. Based upon historic measurements of stream flow and water levels, wetland creation areas were selected at locations adjacent to wetlands that may become seasonally flooded or saturated. The wetlands will be created by removing soils and lowering the ground surface to the approximate elevation of the water table. The wetland creation areas have a shallow water table and adequate depth to bedrock to minimize the area of disturbance and the volume of soil to be removed.

The Mitigation Plan includes a planting schedule: a list of plants, quantities, size, density and other information. Any substitutions will be coordinated with the regulatory agencies. This plan avoids the use of invasive plant species that crowd out other plants or threaten to choke the wetlands. The plan identifies the invasive species and anticipates control measures that will be needed to get rid of them.

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The Importance of Wetlands

Because the landfill remains a continuing source of contamination, the Remedial Action Plan recommends capping the landfill and former chemical pits, capturing and treating the leachate from the site and digging up and consolidating contaminated soils and sediments and waste. Although this work will have the positive effect of eliminating or controlling the discharge of contaminants, the remediation activities will have an impact on the surrounding wetlands.

Scientists and policy makers have understood the importance of wetlands for many years, and the public is coming to recognize their important role in the health of ecosystems. Where draining and destroying wetlands were once common practices, now state and federal governments are seeking citizen support to achieve a net increase of 100,000 acres of wetlands a year by 2005.

Wetlands play a number of important roles in natural ecosystems. Wetlands range from tidal marshes and seasonal ponds (known as vernal pools) to bogs, freshwater marshes, fens and swamps. Wetlands have many benefits, including:

- Supporting birds and other wildlife;
- Hosting rich organic matter and nutrients;
- Offering a home to a great diversity of species;
- Buffering other lands from erosion;
- Providing flood control by intercepting runoff and storing stormwater;
- Capturing sediments and filtering pollutants, which results in improved water quality; and
- Presenting recreational opportunities, such as hiking, canoeing, and other leisure activities.

See the box **For more information** (on page 6) for web sites on wetlands and invasive species.

Monitoring

For the first five years after the mitigation is complete, UConn will submit annual monitoring reports to ACOE by December 15. These reports must include information on: the coverage per acre by healthy trees and shrubs; the coverage without invasive species; controlling the invasive plants; and making sure that erosion is not affecting the soils, slopes and other aspects of the restoration.

DEP requires monitoring inspection reports for 10 years. These reports must include photos of the creation and restoration areas; reports on the success of the plan in terms of the plants and wetlands health; an inventory of the plants and their levels of abundance; and an inventory of wildlife in the area. UConn has identified Mr. Christopher Mason, PWS, and Mr. Jeffrey Bridge, PWS, both of Mason & Associates, Inc., as the qualified wetland scientists who will perform annual inspections of the wetlands creation and restoration areas.

Developing the Plan

The Mitigation Plan was developed and evolved after site meetings and consultations with the permitting agencies. UConn's consultants met with representatives of the U.S. Environmental Protection Agency (EPA), ACOE, DEP and the U.S. Fish and Wildlife Service. The agencies gave UConn input on the preliminary plan, which was refined to meet the state and federal regulations.

The Mitigation Plan of wetland restoration, creation and enhancement meets the following goals:

- No net loss of wetland area, functions or values
- Restoration of the wetlands that will be disturbed by the remediation
- Creation of new wetlands with a reliable source of groundwater flow
- Creating buffer zones to protect the wetlands from human activity
- Enhancement of the wildlife habitat
- Control of invasive and exotic plant species
- Practical, low-cost construction

Wildlife in the wetlands includes turkeys and other birds, beaver, especially in an area northeast of the landfill, deer and other small mammals. No federally listed or proposed threatened and/or endangered species or critical habitats are known to be in the project area. (This subject is addressed in Appendix D of the plan.) Vernal pools in the area are used by pool-breeding amphibians, such as the wood frog and spotted salamander.

Educational Opportunities

The wetlands north of the landfill offer UConn and the surrounding community the chance to undertake education and outreach. Possible topics of interest include observing wildlife, studying the function of wetlands, reviewing mitigation monitoring and conducting research on controlling invasive plant species. UConn at Storrs is the center for Connecticut's invasive species research program and these wetlands offer an on-site laboratory for observation and testing in connection with the invasive species control required by the Mitigation Plan.

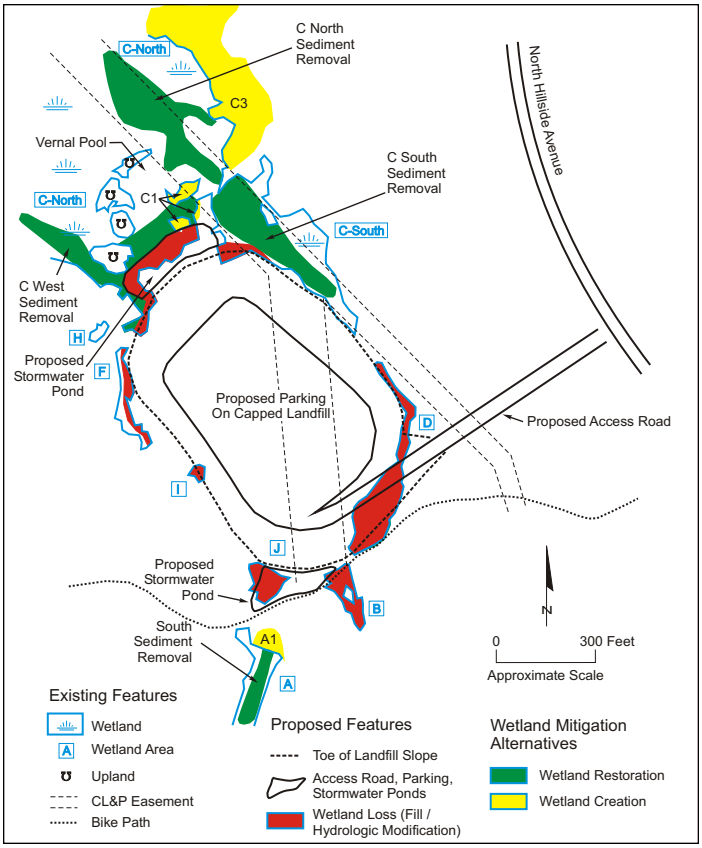
Top: Sediments – represented by the iron coloring the water orange – will be removed from this existing wetland south of the landfill.
Bottom: This junk-strewn area north of the landfill will be cleaned up and reconstructed as a new wetland.

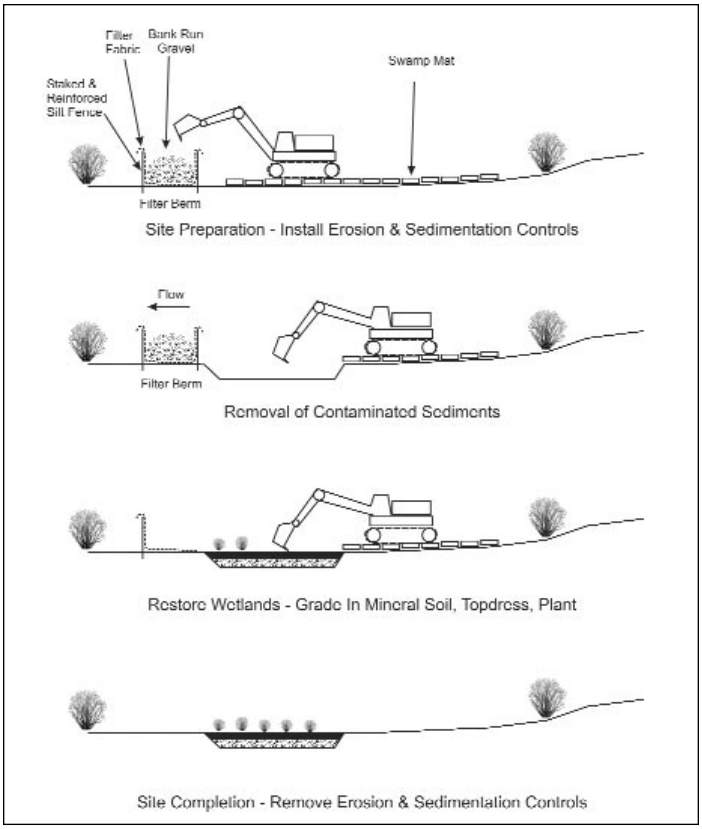
Other Permits

In addition to wetland-related permits, the University applied for (and recently received) a Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. This permit regulates the management and discharge of stormwater generated by rainfall on the construction area to protect water quality in the wetlands and streams in the Study Area. UConn also applied for General Permits for Discharge of Groundwater Remediation Wastewater, which apply to water collected during dewatering of excavations required for closure of the landfill and former chemical pits, including trenches for utilities, and water that will be generated by the leachate interceptor trenches. These waters will be pumped or transported to the UConn's Water Pollution Control Facility (WPCF). DEP has indicated that it intends to modify or amend an existing permit that was obtained for management and discharge of groundwater pumped from monitoring wells during the Hydrogeologic Investigation and Interim Monitoring Program. Finally, DEP anticipates issuing its written approval for Disruption of a Solid Waste Closure Area, Landfill Closure and Post-Closure Use into a single approval letter.

The Review Process

Once the comment period has been announced, DEP will accept comments on the Wetland Mitigation Plan and permits in writing. Comments can be submitted to Sara Yates, IWRD, 79 Elm St., Hartford, CT 06106-5127.





Top: The map shows the locations of sediment removal and wetland loss and mitigation.
Bottom: The graphic depicts the steps in sediment removal and wetlands restoration.

Components of the Wetland Mitigation Plan

The table lists the wetland and acreage that will be impacted by the Remedial Action Plan construction (see the map at left to locate each site) and the restoration method for each one.

Type of Mitigation	Area	Size/Acres
Restoration	A	0.34
	C north	1.00
	C south	0.84
	C west	0.79
Subtotal - Restoration		**2.97**
Creation	A1	0.12
	C1b,c,d	0.12
	C3	1.59
Subtotal – Creation		**1.83**
Enhancement		
Invasive species control area		**12.4**
Preservation	A, C, H	**21.0**

Components of the Mitigation Plan

Restoration describes measures that will be taken in wetland areas that will be disturbed by construction, but not lost. After work has been completed, these wetlands will be re-established by natural means. Organic soils capable of sustaining wetland vegetation will replace contaminated sediment or waste that has been removed. Native vegetation that will thrive in this setting will be planted or seeded.

Wetlands creation involves constructing new wetlands by excavating areas next to existing ones. Soils are excavated to just below the water table to create a wetland environment that expands the existing area. Then the newly created areas are planted with native vegetation and monitored to ensure that groundwater flow and runoff can sustain a wet environment. These wetlands will also be monitored for invasive species (e.g., Common or Great Reed) that could pose a threat to the native plants. If needed, measures are taken to remove the invasive species that can clog and endanger the wetland.

Wetlands enhancement calls for improving existing wetland habitat and wetlands that will be disturbed, then restored, by removing waste, fill materials and debris. It includes controlling problem invasive species and exotic plant species. Enhancement also includes designing open space buffer areas that will be accessible to the public and University community for wildlife viewing and education. It includes removal of debris and rubble that have been disposed of in the wetlands. The photo on page 3 shows an area currently spoiled by debris that will be cleaned up and planted with native vegetation.

Monitoring and reporting are required for five years by the Army Corps of Engineers (ACOE) and for ten years by the DEP. (See Section 14.0 of the Mitigation Plan.) The mitigation areas will be inspected monthly to make sure the plantings are thriving, the soils are wet, erosion and silting are not impacting the restored wetlands, permit limits are being met, wildlife are thriving and invasive species are not taking over the area.

Action Update

- **Well Sampling**: Until the Closure Plan is completed, domestic and other wells near the project Study Area have been the focus of the **Interim Monitoring Program (IMP)**. This sampling includes groundwater, surface water and domestic wells in the Study Area and around its perimeter. Round 13 sampling took place in February 2004 and was reported to DEP and homeowners in June. Sampling for Round 14 took place in late May 2004 and the reports went out in August. The 15th round of sampling took place in September 2004, and the summary report and individual letters will be sent out in October. Results from Rounds 13 and 14 are consistent with previous data. The IMP will be replaced by a Long-Term Monitoring Plan (LTMP) after the Remedial Action Plan has been implemented. Monitoring will continue for 30 years.
- **Extended water service**: UConn has extended water service to six residences on North Eagleville Road and Meadowood Road (a seventh homeowner declined the connection). These connections were completed in June 2004 and included disabling the existing private residential wells.
- **Chemical Analyses**: Water quality samples collected on the project are now being analyzed by an independent, state-certified laboratory, Phoenix Environmental Laboratories, Inc., located in Manchester, CT (http://www.phoenixlabs.com).

O&G Qualifies as Construction Manager

UConn used a competitive bidding process to hire a Construction Manager (CM) to manage the closure of the UConn landfill and former chemical pits. Six firms qualified to bid on the project. O&G Industries of Torrington, CT, was the successful bidder.

The CM will play an important role during the design phase, advising UConn on scheduling, pricing, materials and construction methods. The CM is charged with keeping the project on time and within budget, but the company has other important functions. O&G will be coordinating construction with neighboring projects, and overseeing such work as dewatering and compliance with conditions of all of the permits. A major element of the construction will be overseeing the excavation, dewatering and consolidation of approximately 28,000 cubic yards of outlying waste materials and contaminated sediments on top of the landfill.

UConn based the selection and award of the CM contract on an evaluation of the proposals submitted by Pre-Qualified CMs, their applications and further supplementary information obtained by UConn. The CM represents UConn on the job and it will also be the liaison for community issues that UConn will be managing. While the design and implementation plan tried to anticipate problems during construction, if any problems arise, UConn will address them as quickly as possible through the CM.

Chronology of Recent Submittals

Comprehensive Hydrogeologic Investigation Report and Remedial Action Plan
- Approved by DEP 6/03
- Revised plan and responses to comments to DEP 4/04

Closure Plan
- Submitted to DEP 8/03
- Reviewed by public 9/03
- Review by DEP 12/03
- Revised plan 1/04
- DEP review ongoing

Closure Plan/Response to Comments
- Comments in 9/03
- DEP review 12/03
- UConn reply 1/04
- DEP review ongoing

Interim Monitoring Program
- Round 14 submitted to DEP 8/04
- Round 15 sampling began in 8/04

Final Wetlands Mitigation Plan
- Requested by ACOE 12/03
- Submitted 6/04
- DEP review ongoing

CLOSURE SCHEDULE

✔ Preparation of Bid Documents	Weeks 1-4
✔ Hire Project Construction Manager	Weeks 2-3
Review Contractor Submittals	Weeks 3-11
Mobilization, Site Preparation, and Stormwater/Erosion Control	Weeks 11-16
Contaminated Sediment Removal and Relocation	Weeks 17-22
Waste Consolidation	Weeks 23-34
Construction of the LITs	Weeks 35-40
Land Reshaping and Grading	Weeks 38-42
Cover System Installation	Weeks 43-49
Road and Parking Lot Construction	Weeks 38-50
Project Completion, Demobilization and Closeout – Installation of Monitoring Wells	Weeks 51-54
Preparation of closure certification report	Weeks 55-58

✔ *Indicates a completed task*

Acronyms in This Issue

Commonly used acronyms in this *Update* include:

ACOE – Army Corps of Engineers
CM – Construction Manager
DEP – Department of Environmental Protection
IMP – Interim Monitoring Program
IWRD – DEP's Inland Water Resources Division
LTMP – Long-Term Monitoring Plan
O&G – Construction Manager for UConn's Landfill Remediation Project

For more information . . .

There is a wide variety of information available on the Internet about wetlands, their health and restoration; invasive species; and other related topics. Readers can begin with the following sites to explore these topics further:

- **www.epa.gov/owow/wetlands/restore/** – This Environmental Protection Agency (EPA) Office of Water site offers a wide variety of information on wetland restoration, creation and enhancement. It includes An Introduction and Reader's Guide to Wetland Restoration, Creation and Enhancement, information for the general public.
- **www.invasivespecies.gov** – This site is a gateway to agencies, databases and educational resources about invasive species that harm wetlands and lead to a loss of biodiversity.
- **http://www.wetlands.fws.gov** – The Wetland Interactive Mapper offers access to the National Wetlands Inventory maps.
- **http://www.fws.gov/data/statdata/ctdata.html** – Connect to data on Connecticut's wetlands and links to EPA New England's Adopt a Wetland Program.

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UPDATE REVIEWERS

The following parties reviewed the copy for this edition of the UConn *Update*: Ray Frigon, CT DEP; Rob Miller, EHHD; Martin Berliner, Town of Mansfield; and members of the UConn consultant team.

Note: This Update *was printed in color to show features of the wetlands and key elements in the wetland mitigation map on page 4.*

COMING NEXT TIME

- **Interim Monitoring Program Results**
- **Construction Schedule and Update**

WHERE WILL I FIND THE DOCUMENTS?

www.landfillproject.uconn.edu

Copies of all project documents are available at:

Town Manager's Office
Audrey P. Beck Bldg.
4 South Eagleville Rd.
Mansfield, CT 06268
(860) 429-3336

Mansfield Public Library
54 Warrenville Rd.
Mansfield Center, CT 06250
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