



## Waste Beds 9-15 Closure Plan

### Meeting of Combined Lake Cleanup Citizens Working Groups

February 8, 2011

A presentation of the Evapotranspiration (ET) capping system proposed by Honeywell for capping Waste beds 9-15 was made by Dr. Tim Volk of ESF. The following notes summarize the presentation and follow up questions.

An introduction about the status of the capping project was made by Ken Lynch, NYSDEC. Honeywell performed a demonstration project to show that use of an alternative capping system using shrub willows as the vegetative cover component is an effective alternative to a conventional cap (soil or geosynthetic). The actual closure work plan is due in from Honeywell this week. The closure plan will include more details on how Honeywell intends to proceed with the project, what materials or combination of materials will be used to construct the cap and the construction/sequencing schedule. Once the DEC has had a chance to review the plan, there will be a public meeting(s) with Town officials to review the details of the plan.

Dr. Volk indicated that approximately 200 alternative ET caps have been installed over the last several years. The main focus of evaluating an alternative capping system is to minimize the overall impact of the project without diminishing the protection afforded to human health or the environment.

In an ET cap the plants selected need to:

- Take up and move large volumes of water
- Have a long growing season
- Exhibit rapid growth
- Have a large and deep leaf canopy
- Have potential for green energy – not required but preferred
- Be suitable for the environment in which they will be placed

Based on the above criteria, they selected about 40 species of shrub willows for further analysis. One of the main reasons for selecting willows is that they are one of the first plants to develop leaves in the spring and last plants to lose their leaves in the fall. They set up tests in a greenhouse with these plants to check their growth rates. Between 10 and 15 species proved worthy of further testing. Next a 3-4

month test was done in the greenhouse growing the plants using different organic amendments to the waste bed material.

Testing of the various willow species was moved to the field (waste beds). The 3 year growth rate of the willows on the waste beds is comparable to growth rates experienced elsewhere in normal soils.

There were two other considerations in selecting an ET cap. First, an ET cap is carbon neutral . Second, assuming that the wood can be harvested on a regular cycle and burned to produce electricity, the willows should result in a net energy gain of approximately 10 to 1.

The following questions were asked by various attendees and answered by Dr. Volk or the NYSDEC.

**Were any other plant species evaluated?** Several other plant species were considered but not pursued for a variety of reasons. Serious consideration was also given to hybrid poplars but they did not respond well in the Solvay Waste.

**How is the performance of the ET cap affected by seasonal weather variations when the willows will not take up much water?** The ET capping system needs to establish adequate storage capacity to hold water during dormant growth seasons. They did monitor the water flow through the capping system and while the water movement varied, very little water passed into the Solvay Waste below the capping system.

**Does harvesting the willows impact the intake of water?** The willows grow back from the cut stems. All harvesting is done during the dormant season and the willows do grow back quickly in the spring. There is a gap that does occur so the storage zone should be designed to account for this. The willows should be harvested on a 3 year cycle with approximately 1/3 of the willows harvested in any given year.

**How many willow species are proposed to be used?** While there are over 175 species of shrub willows in nature, between 10 and 15 different varieties will be utilized on this project to minimize impacts from pests and disease.

**What are the actual admixtures/nutrients to be used?** Some of the pilot testing was done with bio-solids from the Anheuser-Busch brewery and manure from horse farms in the area. There are several other organic waste streams that could be utilized.

**How often is it necessary to add nutrients to the plantings?** The nutrient levels will need to be monitored to see how long they last or if they need to be replaced/replenished. Some areas that were used for test plots contained Solvay Waste that was blended with bio-solids 10-15 years ago and these

areas still have the appropriate nutrient loads. As far as the willows are concerned, they only have a couple of years of data available but so far the nutrient levels are ok.

**What is the expected life of the willows if they are harvested every three years?** They expect them to grow for decades on end.

**Has end uses for the waste beds been considered? Won't planting the entire waste beds with willows inhibit future possible recreational uses?** The DEC will be involving the public through future meetings about possible end uses for the waste beds. Capping the entire waste beds with an ET (willow) cap would definitely limit future uses. The total area allowed for an ET cap still needs to be evaluated by the DEC and more information needs to be provided by Honeywell for the DEC to review. A willow cap does provide habitat diversity and they have seen this in the birds and small mammals in the test plots. The test plots have been too small to evaluate diversity for other mammals.

**Is the ET cap still a viable alternative if there is no market for harvested willows?** Marketing the willows, say as a fuel source to produce electricity, is an added benefit of the proposed project. The ET capping system can be managed regardless of whether or not the willows are harvested.

**What is the proposed depth of the ET capping system?** The test plots included mixing the on-site material with bio-solids to a depth of 18-inches. This should provide enough storage depth as well based on field observations.

**Has anyone actually done the math on how many trucks would be required to truck in organic material to mix with the Solvay waste to see how it compares to the number required for a conventional cap?** This calculation should also include future trips required to supplement the nutrient requirements to keep the plants thriving. That has not been quantified but can be done and made available.

**Has the DEC done a side by side comparison of how much water will pass through the ET cap versus how much will pass through a conventional cap?** Computer modeling has been done that shows how the ET cap and a traditional cap will perform (different computer models are used for each one). They also have monitored the quantity of water that has passed through the ET cap test plots. A conventional cap test plot has not been constructed on site but there is considerable historical data on their performance. The DEC will review all of this data as they review Honeywell's closure plans.

**Are there any concerns about exposure risks to the public while the installation of the ET cap, particularly related to the mixing of organic material with the Solvay Waste? What about recreational users after the cap is in place?** The NYSDEC and Dept of Health will take a hard look at these issues before anything is approved.