

**Chehalis Basin Partnership  
Water Quality Committee  
Grays Harbor County Forestry Building  
Montesano, Washington  
November 12, 2009  
9:30 a.m.**

**Meeting Summary**

**MEMBERS PRESENT:**

Janel Spaulding, Grays Harbor College/Chehalis Basin Partnership  
Dave Rountry, Department of Ecology (DOE)  
Patrick Wiltzius, City of Chehalis  
Dave Jarzynka, Briggs Nursery  
Teri Franklin, Citizen, Grays Harbor County  
Rich Geiger, Mason Conservation District  
Cindy Burton, US Department of Agriculture  
Kelly Verd, Lewis County Conservation District  
Harry Pickernell, Confederated Tribes of the Chehalis Reservation  
William Gow II, Puget Sound Meeting Services

**Call to Order, Introductions and Changes to the Agenda**

Patrick Wiltzius called the Chehalis Basin Partnership (CBP) Water Quality Committee (WQC) meeting to order at 9:31 a.m. Everyone present provided self-introductions.

**Mason Conservation District Presentation**

Rich Geiger, Engineer, Mason Conservation District, provided a presentation on experimental technology the Mason Conservation District is pursuing in Mason County. Paul Stamets, a local resident who has 30 years experience working with fungi media, such as mushroom organisms, employs mycoremediation techniques in the field by using mycofilters to filter fecal coliform from surface water. The technology is patented. The program partners include Mason County Public Works and Mason Conservation District.

Mr. Geiger reviewed water quality issues within Mason County and how it's impacting the shellfish industry. Annas Bay has experienced closures over the years. Lower Hood Canal also experiences closures. Oakland Bay is now a shellfish protection area, which is of concern as it's one of the most productive shellfish areas in the world. Another area of closure is north shore Hood Canal. Shellfish in Mason County is big business employing hundreds of people and shipping products internationally. Water quality protection is key to the economic health of Mason County.

The Mason Conservation District focuses on agriculture as well as water quality in general. The district encounters problems in applying best management practices (BMP) on waterfront agriculture areas where a uniform slope exists along the shoreline with soils that don't perk well. Any rainfall tends to run off the surface carrying contaminants into saltwater. Some of the areas have groundwater springs with water that is also contaminated before flowing into saltwater.

Mason County Public Works has been challenged in dealing with water quality as the county's drainage systems with contaminants drain directly to saltwater. Many roads in Mason County were built along the shorelines during the 1800s and early 1900s. The geography of Mason County includes many steep areas ascending directly to the shoreline with plateaus with buildings and roads that drain into saltwater. When the roads were constructed there was no consideration for water quality or filtration.

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After contacting Mr. Stamets, a decision was rendered to try mycofiltration. Mr. Stamets had tried the method and was encountering issues with installations remaining in place. The burlap bags were examined from an engineering standpoint and the district and Mason County Public Works assisted in re-engineering the bags for installations to remain intact. The intent of the project is capturing microscopic contaminants. The mycofilters, which are burlap bags are filled with woodchips inoculated with mycelium, a fungus that feeds on fecal coliform in the water as it passes through. The mycelium eats the fecal coliform and discharges pure nutrients.

Mr. Geiger displayed a photo of the first project installation in Mason County along State Route 3 in the vicinity of Ecler Road. The area was experiencing exceptionally high levels of fecal coliform in drainage. Data was taken of upstream and downstream areas. The results indicated a decrease from 240 MPN/100mL to 30 MPN/100mL and from 1610 MPN/100mL to 240 MPN/100mL. One unusual observation from 30 MPN/100mL to 110 MPN/100 mL was likely due to the method of reading the sample. The results reveal that statistically significant reductions in fecal coliform were occurring in the field. Additionally, experimentation by Mr. Stamets in his laboratory proves scientifically that the fungal media does reduce fecal coliform. This is the first time the method has been tested in the field. With the installation, there was a statistically significant reduction in fecal coliform.

The first installation occurred on agriculture land that had similar site characteristics, such as low permeability soil and uneven slopes descending to saltwater. Prior measures with the landowner failed. The landowner had two issues involving his livestock and migratory geese that gravitated to the pastures. With the installation of mycofilters, the results were effective in bringing the landowner into compliance.

Discussions began with Mason County Public Works after the department approached the district because of water quality issues. Mason County Public Health, Mr. Stamets, and the conservation district launched some pilot installations and experimentation. The goal is protecting water quality while also proving the technology as a viable BMP. Public Health provided projects site locations with long histories of documented water quality issues. Those sites were targeted for the experiments.

Next, the sites moved to urban areas, such as Belfair with three different installations. One site is considered a high energy installation because it was more problematic and included different kinds of issues, such as metals. The analysis revealed that the fungus and some algae likely rendered contaminating metals inert. That investigation is in the beginning stages.

Drainage in Hoodspport from a culvert off US Highway 101 revealed that the test samples were in compliance with fecal coliform following installation of mycofilters.

Mycofilters are both a physical filter as well as a single living organism, which must be in the water to collect contaminants. The system needs air and is connected to surrounding vegetation. Organisms in the water collect nutrients and pass them along the single cell strands to the sides of the shoreline where it's consumed. The team is still working on how to install the filters to ensure they live and thrive. Fast flows require many filters placed in rows to accommodate flows. Anchoring and laying out the filters proved challenging to ensure they remained intact and in place. The application consists of a natural fiber burlap bag filled with woodchips treated with mycelium. All prior installations were defeated by high flows. The district and Public Works assisted Mr. Stamets in determining effective ways to anchor the bags to stay in place during high flows. Through that process, it was determined that the bags must be installed on existing vegetation and not on bare soil. Size of the area is important and the team began looking at establishing large colonies to the extent possible with different configurations dependent upon the treatment area.

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Mycofilters release nutrients and enzymes with the enzymes promoting growth of bacteria in plants that have like characteristics downstream that also have the characteristic of eating fecal coliform as its food. In agriculture applications, it's possible to have more effective filtration in smaller areas requiring smaller buffers. Mycofilters in an agriculture application are placed in an even contour.

Mr. Geiger described the configuration for roadside installations that require a grass ditch not scheduled for mowing or cleaning. Ditch flows are important for designing the anchor process. He shared photographs of different types of roadside installations and described the differences of each application.

In Mason County, shorelines are heavily developed. It's difficult in steep terrain to find areas for filter strip treatment. It's easier to work within the public right-of-way rather than traditional stormwater installations, which can be large. The Public Works Director likes mycofilters because of the ease of installation, simplicity of design and application compared to the design effort and installation of typical best management practices. The installations fit within right-of-way and present no liability issues and they require minimal maintenance. The Director compared the benefits of mycofilters versus bioswales in terms of equipment, personnel, timing, and cost. The installation of mycofilters requires less personnel, equipment, and time and at a much lower cost. The provider of the bag wants the county to begin producing the bags, which will decrease the cost of each bag from \$10 to \$4. To date, no traffic control has been required to install mycofilters in right-of-way. Mycofilters can be installed close to the source of contamination as well.

Other advantages include no threat to buried utilities, no need for waste disposal site, no sediment erosion control, no flow bypass or pump out, or additional delivery vehicles. A mycofilter crew typically includes two persons versus a bioswale crew of six individuals.

Performance to date reflects statistical reductions. Over time and during cold weather, mycofilters lose effectiveness with the mycelium dying. Natural fiber burlap bags begin deteriorating after a year. To further develop the technology, tests must be completed for both water quality and the presence of mycelium, as well as learning more about sustaining mycelium growth, especially in the second season, such as inoculation or other measures for prompting growth. Mason County Public Works is working on developing longer-lasting bags, such as polymer net bags that can be placed over the natural fiber bags. The team is working on proving the technology as a water quality BMP based on the requirements established by Department of Ecology.

Dave Jarzynka asked whether other types of contaminants can be removed with the application. Mr. Geiger said the mycofilters are also effective in sediment control.

Dave Rountry asked whether the testing process is based on pollutants in particular. Mr. Geiger said the process is currently targeting fecal coliform because it's the most pressing water quality issue. However, there is evidence that there may be some benefits of treating heavy metals. At this point, the decision is to move forward with fecal coliform only, which limits testing to that pollutant. According to Mr. Stamets, some strains of mycelium will convert metal to an inert form.

Mr. Wiltzius commented that technology appears to be effective, but with the lifecycle limited, the bioswale option is obviously the more cost effective in the long-term. Treating fecal coliform is a long-term process. However, the technology is exciting. Mr. Geiger said for Mason County, the issue is lack of land to install bioswales.

Terri Franklin referred to a similar application of duckweed in the Arkansas area to clean groundwater around chicken processing plants.

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Mr. Rountry questioned the reasons leading to the death of mycelium. Mr. Geiger said more information is needed on the growth of mycelium to become better informed as installers to maintain the health of colonies. In natural settings, mycelium continues to grow and thrive. However, for whatever reasons, in the applications there has been no success in a colony coming back. He stressed that other water quality BMPs are necessary and that the application is not the end all. However, for Mason County, mycofilters have been successful in bringing areas into compliance that were not possible through other BMPs.

Mr. Wiltzius suggested exploring an option of establishing a substrate colony of mycelium that may survive the weather.

Members thanked Mr. Geiger for the presentation.

### **Discussion on Monitoring of Water Quality Sites**

Mr. Wiltzius reported the discussion will focus on water quality monitoring sites to determine which sites could be removed or monitored less frequently at the request of the Chehalis Tribe. In reviewing the State of the River Report, some sites that could be removed include those that are currently experiencing good water quality, hard to reach sites, basins with no human activity, or reducing some sites on the main stem.

Janel Spaulding distributed spreadsheets of the monitoring locations with data based on monitoring results for the four different water quality parameters of dissolved oxygen (DO), fecal coliform, turbidity, and temperature at different times of the year. The spreadsheets are in order from the fewest to the highest violations for water quality standards.

Mr. Wiltzius said he listed all high water quality sites on a chart and was able to determine some areas where monitoring could be eliminated for 15 sites. There are 95 monitoring sites. Mr. Jarzynka agreed with the recommendation to cut those sites. Ms. Franklin suggested considering monitoring for all sites at least once annually or possibly twice during the summer and winter, and less frequently for the other sites to ensure that if problems do occur they can be addressed sooner rather than later.

Members discussed other monitoring options, such as changing the frequency from monthly to quarterly. Mr. Rountry suggested an option of maintaining the frequency of sampling but at fewer sites and focusing less on those sites that are high quality or not of priority for follow-up at this time.

Mr. Wiltzius said the report identifies reaches that need corrective action. The issue is whether the overall goal is continuing to provide statistical data frequently or continue monitoring quarterly until funding is available. The statistical data is already available. Current sampling data adds to the existing dataset.

Mr. Rountry said that most of the sites need protective water quality standards for fecal coliform bacteria. The greater concern, particularly for fish and aquatic organisms, is temperature and DO. Since data reveal generally good conditions except with some problem areas, such as Ocean Shores, Winter Creek, and Hoquiam River, it might be possible to monitor during the times problems occur from June through August or May through September. Primarily, from June through August conditions are generally worse for temperature and DO. Even with monthly sampling, it's not sufficient to remove those sites from the list because the threshold has been increased. Temperature and DO are major concerns and a lower frequency of sampling is not recommended. Harry Pickernell added that the Tribe plans to continue monthly sampling.

Mr. Wiltzius questioned the role of DOE in sampling sites and whether the Partnership is duplicating the department's efforts. It appears the Partnership is in a screening mode and perhaps may be taking on too much of the responsibility. The issue is the role of DOE. The same issue was discussed at the last meeting regarding the next steps for the State of the River Report. The issue is whether the Partnership is assuming too

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much responsibility. The question is whether there is sufficient information to identify the problems and whether it's valuable to continue the monitoring program. Members of the committee are non-professionals in terms of water quality monitoring and perhaps the decision should entail seeking advice from the professionals.

Mr. Rountry advised that not much water quality sampling is being completed by DOE in the Chehalis system. There are approximately five sites that are sampled by airplane drop in the estuary in Grays Harbor. Monitoring efforts should involve everyone. DOE's actions in field monitoring are not significant at this time. The value in maintaining some monitoring activities at some of the sites is in evaluating trends and patterns over a period of time. That is one of the objectives of the monitoring effort. Mr. Rountry said he reviewed the sampling plan to revisit the purpose of the monitoring program and how the data was to be used. Given the budgetary constraints that all agencies are experiencing, the goal is to improve efficiencies and strategically consider the number of sampling sites. Mr. Wiltzius said at the last meeting, the committee discussed re-engaging former members so that they can use the data. Conservation districts should be using the data or providing feedback on what they need.

Ms. Franklin said she would like to use the data for the critical areas ordinance to document issues. The committee has never been successful in having a representative from the Department of Natural Resources attend committee meetings. Some of the issues, such as turbidity in the Satsop are likely the result of forest practices. A better job in forest practices should be pursued. Mr. Wiltzius advised that the committee intends to pursue some outreach to involve other organizations.

Mr. Wiltzius reviewed his recommended list of proposed sites to discontinue sampling at this time: 3270, 3269, 2334, 2333, 2385, 2386, 3260, 3264, 3265, 3267, 3287, 3288, and 3394.

Mr. Rountry said the temperature studies reveal it will take time for new vegetation to grow to enhance riparian cover and restore healthy conditions for temperature. Another way to consider the issue is looking at data for temperature for many of the sites and consider not sampling for temperature or select sites to continue monitoring that would focus on temperature. Alternatively, existing information could be used for temperature as a baseline or for a demonstration of ambient conditions to this point and revisiting monitoring in the next several years. Another option is selecting subbasins for sampling that are of higher priority.

Mr. Pickernell said he understood that the program would begin monitoring the entire basin to locate areas of concern for future efforts.

Mr. Wiltzius commented that if the majority of the sites in violation could be plotted on a subbasin scale, areas of focus could be determined in each WRIA for conservation districts to consider in terms of potential projects. Members discussed various methods for plotting data to identify subbasins and whether to include a combination of water quality parameters or individual water quality parameters.

Cindy Burton questioned the beneficial uses that are driving the need to identify water quality conditions. Mr. Wiltzius said Don Loft was beginning the work and was able to identify land use in the Black River prior to his departure. When the committee makes the decision on which sites to continue monitoring, members could look at the land use to determine if that specific area should be an area of focus compared to another subbasin that is less populated and the problem can't be targeted.

Ms. Burton said her agency has a program what would be supportive of subbasin issues, such as trying to resolve water quality problem with a focus on agriculture. The agency could work with the committee on some funding to work with Ag producers or forest landowners on a watershed basis. However, the funds cannot be used for sampling.

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The committee agreed to defer any decisions until the next meeting after Ms. Spaulding identifies monitoring sites by subbasin. It was noted that maps from Salmonscape on areas of fish importance should also be provided. Ms. Franklin offered to provide information from Salmonscape.

### **Water Quality Committee Origin and Future Direction**

Dave Rountry reported he didn't have an opportunity to review previous meeting summaries for determining the purpose of the committee.

Members offered reasons for their attendance to committee meetings.

Ms. Franklin said she attends to receive information on water quality data that she uses for other causes, such as Grays Harbor County's Critical Areas Ordinance meetings and development of the county's comprehensive development plan. She said she's interested in ensuring sustainability for the future and protection of resource lands. Information and data from the committee is helpful to her when she attends meetings or when she speaks to others about the status of the watershed, forest, Ag, and other natural resource issues.

Ms. Burton said her agency's mission is conservation on the ground. It's important to have projects implemented to clean up water, which is the number one goal of the agency. Her job is working with a non-profit organization, Columbia Pacific, which partners with many different entities to complete projects.

Mr. Jarzynka said he joined the committee to increase his awareness of water quality in the Chehalis River and how that affects his company and its employees either positively or negatively.

Mr. Wiltzius said he began attending for similar reasons when the Partnership was established. At that time, the City of Chehalis was having water quality issues with DOE and TMDLs. The city became involved and those issues were eventually resolved. However, the city is still concerned. He originally began attending the STC meeting and became a member of the Water Quality Committee after it was established with the intent to protect the city's interest, promoting good discussions, and ensuring any activities are completed on a scientific basis that considers cost and the human factor. The committee was also established to help rank DOE funding grants/loans that involved a ranking process.

Mr. Pickernell commented that he attends to learn about projects underway and sharing information. He asked whether the committee accomplishes anything that couldn't be accomplished by the Partnership. Mr. Wiltzius affirmed the committee accomplishes more because the Partnership doesn't operate at the technical level. The committee also provides a different perspective.

Kelly Verd said the conservation district is involved with the committee because the district's focus is on water quality. The district works with landowners to help clean up the water without pursuing enforcement. It's important for the district to know what's occurring with other agencies. Clean water is the greatest asset of the watershed.

Ms. Spaulding said she attends to provide staff support to the committee. Efforts and work involving water quality are of interest to her personally as well. She is working with the Centralia Stream Team and is currently working on establishing a Grays Harbor County Stream Team. The information she receives from the WQC is shared with citizens who participate on the stream teams.

Mr. Rountry said the WQC essentially became a second generation TMDL advisory group to address some of the other water quality impairments further upstream. The Partnership wanted broader representation of interests throughout the basin in assisting in TMDL discussions and decisions. That's how he became involved in his official capacity as a representative of DOE. The committee provides an opportunity to

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coordinate with others who have similar interests throughout the basin and to receive information on their interests, concerns, and issues. The committee has achieved much and much of what's been accomplished occurred behind the scenes.

Members exchanged information on the committee's accomplishments:

- Ranked funding projects for several years involving presentations from applicants.
- Facilitated approval of protocol for basin sampling.
- Completed State of the River Report based on monitoring efforts.
- Worked on the TMDL Detailed Implementation Plan.
- Attempted to submit comments on Grays Harbor County Critical Areas Ordinance.
- Received numerous informational presentations.
- Developed relationship with the Tribes.

Mr. Wiltzius said desired next steps include seeking a source of funding and re-engaging people to attend and participate at meetings.

### **Plan December Meeting Format for Reviewing State of the River Report**

Mr. Wiltzius said the main goal is to present the State of the River Report, seek comments on the value of the report, and determine how the committee can assist others in their work. Members previously discussed inviting different organizations including conservation districts, fisheries, non-profits, land trusts, and others.

Mr. Wiltzius offered to sign a letter of invitation as chair of the committee.

Ms. Verd reported Lewis County Conservation District along with Thurston Conservation District and Grays Harbor Conservation District are submitting a grant application to DOE for a TMDL 5 grant focusing on horse farms because of the problem that many people are creating when they relocate from other areas and increase the number of horses per acre. The TMDL grant enables the districts to contact landowners and implement farms plans and programs. She asked for the committee's support of the grant application.

Mr. Wiltzius expressed support of the grant application especially if it contributes to improving water quality. He asked whether the applicants can use the State of the River Report to document certain areas where water quality is problematic. Ms. Verd advised that the report is helpful and that she can use some of the data.

Ms. Burton commented on the size of the report and suggested the committee should work on condensing the report and highlighting the important aspects. It was noted that the report includes an executive summary.

Ms. Franklin offered to provide snacks for the December meeting.

### **Other Business**

Mr. Rountry reminded members of the annual Water Quality Financial Assistance Grant Loan application cycle underway in DOE's Water Quality Program. The grant opened in October and the deadline for submittal is December 1, 2009.

Mr. Rountry shared that as part of his work assignment, he is identifying candidate water quality projects, studies, new TMDL initiatives, water sampling efforts focusing on a 303(d) listed areas, or water quality studies that follow up on particular known impairments or suspected areas of problems. He is also looking for potential implementation or restoration projects that either directly implements one of the TMDLs or address a known water quality problem. He asked members to share the information with colleagues as he needs the

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information within the next 30 days. The region will prioritize candidate projects before January 2010. Those prioritized projects will be presented to the program for consideration on a statewide basis. One of the funding sources is Section 319 Water Quality funding from the federal government. Several years, each region allocated a portion of the funds as a subfund that's distributed to the local level. He shared details on a project previously funded under the program.

One project that is anticipated for funding recommendation is the Environmental Assessment Program continuing with its implementation effectiveness verification study in the Chehalis. Currently, the program is using the State of the River Report and other data gathered over the last three years to evaluate and identify some recommendation for follow-up areas for priority restoration. The focus is on the upper Chehalis basin.

### **Next Meeting**

The next meeting is on December 10, 2009.

### **Adjournment**

With there being no further business, the meeting was adjourned at 11:46 a.m.

Prepared by: Valerie Gow, Recording Secretary/President  
Puget Sound Meeting Services