The Washington Stormwater Center - in partnership with the City of Puyallup and the Department of Ecology - is hosting the inaugural Washington State Municipal Stormwater conference. This unique conference will focus specifically on addressing high-priority issues and challenges faced by municipal NPDES permittees statewide and offer a chance to share and learn from other permittees facing similar challenges.”

Day Two, November 6th

8:00AM – 9AM – Pioneer Pavilion

Introductory Remarks, Keynote (Details and Bios to Come)

Three Concurrent Conference Tracks:

Track #1 – Big Picture Stormwater (a.k.a., “I may not be doing this now, but I should plan for it in the future”)

Track #2 – Stormwater Program Efficiencies Now (a.k.a., “I could be doing this now, and here’s how”)

Track #3 – Stormwater Research and News (a.k.a., “finally someone is addressing/explaining this”)

9AM – 10AM

Track 1 - 2014/15 Stormwater Manual and Code Updates – Key Tools and Lessons from Phase I Jurisdictions (panel discussion)

Location: To-be assigned

Presenters: Sherell Ehlers (City of Seattle), Mieke Hoppin (City of Tacoma), Mark Wilgus (King County), Pierce County (tentative)

Abstract: NPDES Phase I Municipal permittees are in the process of updating their stormwater codes and manuals to comply with the requirements of the latest NPDES permit requirements. Several Phase I permittees will present a summary of notable lessons and tools that have been developed as part of these recent updates. Discussions may focus on specific topics that caused the most concern or discussion internally (e.g., among municipal staff and departments) and how those issues were...
addressed or resolved. Likewise, the panel members will introduce notable tools that were developed (or will be developed) to support the code and manual updates, and therefore that may be of use to other jurisdictions faced with similar needs and regulatory requirements. Tools may include checklists, submittal forms, covenants, agreements, sizing tables, LID infeasibility tools, etc. The session will include time for a panel discussion to allow the presenters to elaborate on these topics, compare experiences among their jurisdictions, and address questions from the audience. Given the considerable time and effort that has gone into the recent (and past) Phase I stormwater code and manual updates, the intent of this session is to share the outcomes with an audience of peers who may soon be going through a similar code update process.

Presentation Learning Objectives/Outcomes: This panel discussion will help Phase II permittees and other interested professionals hear first-hand some of the key highlights, challenges, and outcomes from the ongoing Phase I Code and Manual update efforts. Given that Phase II permittees will have to adopt new stormwater ordinances in the coming years, this discussion will provide attendees with valuable lessons and efficiencies that may be applicable to their own pending code and manual updates.

Track 2 - Trash Compactors: Eliminating a major source of Stormwater Pollution

Location: To-be assigned

Presenter: Dan Smith, City of Federal Way, Surface Water Quality Program Coordinator. Mr. Smith is an environmental professional with over 30 years of experience in the environmental and health & safety fields within both the public and private sectors. He currently holds the position of Surface Water Quality Program Coordinator for the City of Federal Way, Washington. In this position, he provides for the implementation of various stormwater and surface water monitoring programs, compliance strategies, and lake management concepts within the framework of municipal governmental operations (specifically NPDES Phase II municipal stormwater permitting). These programs are all centered upon the protection of natural resources, aquatic habitat, native salmon populations, and most importantly, the preservation and restoration of Puget Sound.

Abstract: The City of Federal Way Surface Water Management (SWM) division has identified areas where solid and liquid wastes are handled, stored, and ultimately transferred to disposal company trash receptacles (specifically trash compactors) as significant contributors of stormwater pollution. As a result, appropriate and reasonable water quality code enforcement aimed at eliminating these sources has been carried out per requirements specified in the city’s Phase II Western Washington Municipal Stormwater NPDES Permit. Through focused Illicit Discharge Detection and Elimination (IDDE) actions, the SWM utility has implemented a successful program to correct the problem—a non-compliance
situation which affected nearly twenty five-percent of the trash compactors within the jurisdictional boundary of Federal Way.

Conventional thinking may lead one to believe that commercial establishments and multi-family apartment complexes manage solid waste properly. However, due to storm drainage locations that are often obscured, poor on-site application of pollution prevention best management practices, operator error, the selection of improper equipment for the generated waste stream, and mechanical failures, we discovered that trash compactors are accidents waiting to happen. Stormwater catch basins are almost always located within or adjacent to waste management areas, providing a convenient MS4 entry point that all too often sees flows more appropriate for the sanitary sewer system than our streams, lakes, and wetlands. An initial comprehensive inspection and careful review of compactor mechanisms and their types allowed us to identify these leachate discharges. However, we found that efforts to ensure proper disposal practices on the part of employees was being essentially negated by improperly maintained compactors, dumpsters and other types of holding receptacles.

Federal Way recognizes that SWM and local solid waste regulators must work together to take proactive approaches to ensure that conventional waste streams do not become part of our natural streams, and the city is working to create a vested interest on the part of property owners, businesses, private residents, waste handling companies, health department officials, and contracted trash haulers to eliminate the co-mingling of solid waste and stormwater. While employee/user education and outreach is a critical part of reducing/eliminating these illicit discharges, it is not only human failings that must be addressed with respect to best management practices; equipment selection, maintenance and operation must also be addressed. Compliance through water quality code enforcement has been challenging, but it has ultimately been successful in eliminating prohibited discharges emanating from more than twenty leaking sites. Planned future work may lead to permanent code revisions addressing possible retrofits, or amended ordinances could demand that new compactor installations be directly tied into sanitary. We believe that the lessons learned and the outcomes related to this targeted IDDE effort should be of great interest to other MS4 NPDES permittees.

Presentation Learning Objectives/Outcomes: The expected outcomes and learning objectives of this presentation are relevant to municipal stormwater permit programs: public education, commercial inspections, IDDE investigations, and enforcement. The topic illustrates that these types of prohibited discharges can be significant, and demonstrates the need for multi-departmental (solid waste and code enforcement), multi-entity (health), and multi-organizational (compactor manufacturer) coordination.

Track 3 - STORM: Collective Impact for Stormwater Education and Outreach

Location: To-be assigned
Abstract: Implementation and shared knowledge on permeable pavements can be a barrier to further use of such systems for on-site stormwater management. It’s understandable why there is an inherent resistance to these new methods. As we move forward with new designs influenced by Low Impact Development and policies designed to protect natural spaces within and around our communities, engineers will be challenged to shed traditional design methods for new innovative designs. Pervious pavement is one method in the engineers’ tool box used to implement LID techniques. As we move forward with future designs; materials, performance standards and construction practices will need to be standardized and tested to ensure future investments in our communities infrastructure yields returns suitable for growth. Surface water runoff is the leading cause of pollution in our region; various forms of surface pavement make up a large portion of these engineered landscapes, making it one of the most important components within this tool box. Pervious pavement in sync with other methods will help with stormwater BMP’s. Transitioning is always a challenge but inevitable as we address the issues facing our communities. Industry, education and state government are working together to address these issues, moving us in a direction that influences innovative design, this is one area where we are seeing solid traction and real applications in our surroundings.

The City of Tacoma and City of Puyallup have implemented various green infrastructure projects. These retrofit projects are located on commercial roadways, arterial roads, and residential streets. Permeable pavement, bioretention and sustainable landscape design are the heart of these projects. In Tacoma, the design approaches are rewarded by Greenroads™ in the Pavement Technologies and Environment and Water categories. Permeable pavement in particular has proven to be a cost-effective stormwater management tool for Tacoma. However, it is still evolving and lacks industry standards. Tacoma is currently leading a statewide effort to establish standard specification for Washington.
Greenroads™ provides tools to assist engineers, directors and elected officials to make informed decisions about rebuilding roads sustainably. Green infrastructure is a cost-effective strategy that also manages stormwater. Both require a hands-on approach with a knowledgeable team.

Presentation Learning Objectives/Outcomes: We have learned many valuable lessons in the design, construction, and maintenance of green infrastructure. These lessons extend beyond current manuals and are key elements for retrofit projects. Until green infrastructure is standard practice communities need dedicated teams of civil, geotechnical, and materials engineers, construction and maintenance staff for these projects to be successful long term. This presentation will include a panel discussion on advances in permeable pavement with real world applications and ongoing research information. Topics will showcase existing options for current and future installations. Attention will be given to case studies that identify successful projects and will include areas which presented problems.

Track 2 – Integrating IDDE, Spill Reporting and Facility Inspections to Remove and Prevent Non-Stormwater Discharges

Location: To-be assigned

Presenter: Mindy Fohn, Kitsap County Public Works Stormwater Division, Water Quality Manager.
Mindy Fohn has 20 years of experience in water quality issues in Kitsap County and Puget Sound. She was an environmental technician at the City of Bremerton Public Works, a water quality/septic inspector at Kitsap Public Health District and most recently, the Water Quality Manager at Kitsap County Public Works. Mindy manages the Facility Inspection, Water Monitoring and Education Programs, as well as the Silverdale LID Retrofit Program.

Abstract: Kitsap County Public Works has evolved these programs gradually since 1995 so that now and in the future they operate as one integrated approach. Upon review of the outcomes and effectiveness of the outfall screening program, spill hotline reporting and other inspection programs such as commercial facilities and septic inspections, it was determined that real gains were made with an “eyes on the ground” approach rather than visual and chemical screening of outfalls.

In 2009, a regional spills hotline reporting system was implemented whereby both staff and citizens report spills to one call center, Kitsap 1. Citizen surveys and focus groups provided valuable insight about how to advertise the reporting hotline and addressed major barriers to citizen reporting. The regional nature is unique and involves the Cities of Bremerton, Poulsbo, Port Orchard and Bainbridge Island. It was coordinated with the Kitsap County Department of Emergency Management. Other similar types of responses such as sewage spills, broken water mains, oil spills and ERTS reports were designed into the notification system. Applying social marketing methods resulted in a high impact graphic which was piloted regionally.
Facility inspections were a separate program and focused on public facilities, subsequently migrating to include commercial facilities. However, compliance was hit and miss. Kitsap County then partnered with Kitsap Public Health District from 2006 to 2008 to pilot the program in the urban area of Silverdale, WA. We worked to develop methods, materials and enforcement strategies to obtain 100% property compliance with stormwater maintenance standards and prevention of illicit discharges due to poor housekeeping practices. The compliance target was achieved with surprising immediate and long lasting water quality improvements in fecal coliform concentrations in Clear Creek, a major freshwater stream flowing into Dyes Inlet benefitting downstream shellfish beds. Also, water samples showed improvements at the site scale following dumpster area clean up. Therefore, the program used the same approach to commercial properties countywide. Unincorporated Kitsap County compliance rates have improved from 60% initially and achieving over 90% in 2012. In 2008, with Ecology grant funding, the Cities of Port Orchard, Bainbridge Island, Poulsbo and Bremerton adopted a similar approach for 2 years.

Key components of the facilities inspection program are:
- Compliance with storm system maintenance standards.
- Partnering with Kitsap Public Health to provide additional regulatory power for solid waste and sewage illicit discharge violations when needed.
- Informing property owners that they are responsible for runoff from their property.
- Providing clear and understandable messages to bring properties to compliance.
- Encouraging contracts with maintenance providers.
- Providing limited technical assistance in non-compliance situations.
- Annual inspections forming an expectation of maintenance.

The program has realized time efficiencies with the increased compliance rates so that the number of follow up inspections and violation notices has been reduced. The staffing was reduced by 1.0 FTE in 2013 while at the same time staff duties increased to include a wider variety of work such as culvert inspections and assisting the green stormwater program. Locating outfalls was important in the first Phase II permit, and the new Permit requirements introduce a common sense and effective approach to IDDE building upon the lessons learned in the initial Permit. Future Kitsap County work includes updating the IDDE Program Plan to further integrate these programs. Storm Inspectors will take on the duties of illicit discharge investigations, tracking and reporting. These staff are key to the success of the program, and can tap into staff expertise from Public Health, Code Enforcement, Education and Outreach, and Water Quality Monitoring when needed.

Presentation Learning Objectives/Outcomes: Jurisdictions will learn how to integrate programs increasing effectiveness at preventing and removing non-stormwater discharges while gaining efficiencies. The presentation will focus on how background research guided a review of the outfall.
screening program and comparison to spill reporting and site inspections to identify where to focus efforts, a unique regional reporting hotline approach, partnering with other agencies for education and enforcement, available resources, and the role of quality education messaging.

Track 3 - Recent GROSS and Other Grant Projects – Where are they now?

Location: To-be assigned

Presenter: Dan Gariepy, Washington Department of Ecology

Abstract: (Pending)

Presentation Learning Objectives/Outcomes: (Pending)

11AM - NOON

Track 1 - Improving Stormwater Quality in an Urban Watershed

Location: To-be assigned

Presenter: Lorna Mauren, P.E., City of Tacoma, Environmental Services Department. Ms. Mauren is an Assistant Division Manager with Tacoma’s Environmental Services Department with over 25 years of experience in stormwater and other civil disciplines. She holds a BSCE degree from the University of Washington. Currently Ms. Mauren manages an energetic group of engineers and environmental specialists, whose stewardship of the surface water utility includes asset management, infrastructure replacement, MS4 NPDES permit compliance and innovative approaches to green infrastructure, system maintenance, and water quality improvements.

Abstract: Located in the heart of downtown Tacoma, the Thea Foss Waterway was once characterized by oil sheens, coal tar deposits and dilapidated buildings. In 1985, the EPA declared the Thea Foss Waterway a Superfund site. In 2006, the City of Tacoma and its partners completed a $105 million remediation of the Thea Foss Waterway. This work was in coordination with an aggressive revitalization of the waterfront corridor. Today the waterway is the focal point of a university, several museums, a revitalized downtown district, condominium developments, reconstructed marinas and a recently completed urban water quality research center. With millions of dollars invested and a legacy on the line, it is imperative that the City of Tacoma avoid recontamination of the waterway, especially now that it has emerged as a tremendous economic and environmental asset to the community.
To ensure that the waterway remains the asset it was envisioned and has since become, the City of Tacoma embarked on an aggressive stormwater management program in 2001 including source control, maintenance, rehabilitation, treatment, and education. To track the progress, these efforts were paired with extensive monitoring of stormwater, baseflow and sediment throughout the watershed. Now the twelve-year record of activity has been correlated with monitoring results, and the results are impressive. Forty-four statistically significant time trends (44 out of 49 tests, or approximately 90% of the tests) were shown to be decreasing in Year 12 using simple linear regression. No trends were increasing.

Presentation Learning Objectives/Outcomes: Attendees will be presented with improvements in stormwater quality directly tied to watershed management practices including source control, maintenance, and treatment devices. A cost versus area improved analysis is included. Attendees can clearly deduce where the "best bang for the buck" truly lies.

Track 2 - EPA NPDES Audits – Summary and Lessons from Ecology and Phase I permittees (panel discussion)

Location: To-be assigned

Presenters: Rachel McCrea (Department of Ecology), Bill Leif (Snohomish County), Lorna Mauren (City of Tacoma), Doug Navetski (King County), Kate Rhoads (City of Seattle)

Abstract: NPDES Phase I Municipal permittees recently went through audits of their permit-required activities. This panel discussion will include an introduction from Ecology to provide context for the EPA audits, followed by discussion among the panel members specific to 1) the key challenges and lessons from the audit preparation, as well as 2) significant outcomes and lessons that resulted from the audits. The information will be generally informative to permittees and other stormwater professionals, but in particular will help Phase II permittees understand the realities of the audit process and the effects on permit compliance activities.

Presentation Learning Objectives/Outcomes: This panel discussion will summarize the process and outcomes from the recent EPA audits of NPDES Phase I Municipal permittees. This information has not previously been formally shared with other permittees and stormwater professionals. The audience will learn about the overall audit process and outcomes to inform and enhance their own permit-compliant programs. Specifically, the audience will understand what was needed to prepare for the audits, what might be expected during an audit, and whether and how the audits changed how the permittees implement permit requirements.
Track 3 - Stormwater Underground Injection – An Alternative to MS4 Discharge?

Location: To-be assigned

Presenters: Rod Struck, GSI Water Solutions, Senior Hydrogeologist. Barbara Adkins, City of Portland Bureau of Environmental Services, Project Manager. Rod Struck has 28 years of experience managing water and environmental projects. His expertise in evaluating stormwater contaminants stems from his experience overseeing stormwater source control and environmental cleanup activities within the Portland Harbor Superfund Site, first with Oregon Department of Environmental Quality (DEQ), then with the City of Portland, and currently with GSI Water Solutions, Inc. While with the City of Portland he managed the UIC stormwater program. Barb Adkins manages the City of Portland, Bureau of Environmental Services’ Underground Injection Control (UIC) Program. She has worked for the City since 2006. Barb served as the Co-chair of the Association of Clean Water Age.

Abstract: The City of Portland has about 9,000 Class V underground injection control systems (UICs) that collect stormwater from public rights-of-way and allow infiltration to the subsurface. UICs are an essential element of Portland’s comprehensive watershed strategy, emphasizing more natural, sustainable approaches to stormwater management, and promoting use stormwater as a resource. UICs offer a good alternative to the traditional piped approach and keep runoff in the watershed, out of sewers, and reduce stormwater discharges to rivers and streams. UICs can also provide overflow capacity for sustainable stormwater management facilities.

Portland’s UICs are operated in compliance with a Water Pollution Control Facility (WPCF) permit issued by Oregon DEQ in June 2005. The permit establishes the assessment, operation, maintenance, monitoring, and corrective action requirements that Portland must implement to ensure protection of groundwater as a drinking water resource and compliance with the federal Safe Drinking Water Act. Portland has completed ten years of assessment, management, monitoring, and structural solutions, and has a well-established UIC Program based on minimizing risk. A robust statistically derived monitoring program has been implemented for nine years to characterize stormwater quality to demonstrate permit compliance. The permit includes maximum allowable discharge levels (MADLs) for typical right of way pollutants, based on drinking water standards and requires monitoring at the point stormwater enters the UIC. Of the pollutants detected in stormwater, most were at very low levels with only a small number exceeding 50 percent of the MADLs and a few exceeding MADLs.

One of Portland’s programmatic challenges was the permit requirement to implement corrective actions for UICs with pollutant concentrations that exceeded MADLs for two consecutive years. In response, Portland developed an innovative Groundwater Protectiveness Demonstration model (GWPD) using site specific information. This model evaluates whether stormwater pollutant discharges adversely impact
groundwater following infiltration and attenuation (sorption, degradation, dispersion) in unsaturated soil. Portland’s monitoring and modeling work:

- Demonstrated UICs with discharges of stormwater exceeding MADLs, vertical separation distances >5 feet, and within permit required drinking water well setbacks are protective of groundwater as a drinking water resource.
- Demonstrated structural retrofits or UIC closures were unnecessary to protect groundwater from stormwater discharges within public rights of way, resulting in over 500 no further action determinations from DEQ and an estimated cost savings of >$10 million dollars for implementing corrective actions.
- Allowed Portland to obtain a number of permit modifications, including changes to the MADLs.
- Provided a basis for DEQ’s 2013 permit template benefitting other municipal WPCF permittees.
- The Portland model illustrates the effectiveness of using science to inform policy and in doing so, reaps the many benefits of UICs. Moving forward, Portland will also utilize this programmatic information as it prepares to negotiate its 2015 Permit with DEQ.

Presentation Learning Objectives/Outcomes: 1) Underground injection control (UIC) structures can be part of a comprehensive watershed strategy to use stormwater as a resource by infiltrating it back into the ground. 2) Nine years of monitoring have shown that stormwater UICs in municipal rights of way are protective of groundwater quality. 3) Modeling tools are available for locations (e.g., specific commercial areas) or scenarios (e.g. specific pollutant loads) to demonstrate where pollutants in stormwater runoff are treated by chemical, biological and physical process in the soil to levels that are protective of groundwater. 4) These tools can be used to help determine corrective actions (e.g., retrofits, no further actions) for UICs to maximize capital budgets.

LUNCH AND LUNCH TIME PANEL PRESENTATION: Recommendations for Improving WQA and TMDL Programs in Washington State

Lead Presenters: Steve Britsch (Snohomish County) and Jana Ratcliff (Washington Department of Transportation). Tentative: Larry Schaffner (Thurston County), Mindy Fohn (Kitsap County), Dan Wrye (Pierce County), John Collins (Pierce County), Carla Vincent (Pierce County), Jennifer Keune (King County), Jeff Schnabel (Clark County). The Interagency Project Team consists of staff from the surface water departments of Clark, King, Kitsap, Pierce, Snohomish, and Thurston counties and staff from the Washington State Department of Transportation (WSDOT). The Team was formed to improve implementation of the Clean Water Act (CWA) Section 303(d) and total maximum daily load (TMDL) programs in Washington State.
Abstract: Implementation of Clean Water Act programs to assess waters for impairment and develop clean-up plans (TMDLs) pose substantial administrative, technical, financial, and legal challenges for federal/state/local agencies and stakeholders. Recognizing these challenges, an Interagency Project Team formed in 2012 to discuss approaches to recommend improvements to Water Quality Assessment (WQA) and TMDL programs in Washington State. The Interagency Project Team recently completed a “compare and contrast” approach to identify programmatic methods and lessons learned by Washington State and other states regarding WQA and TMDL procedures. The objectives of the project were to: 1) learn alternative approaches for CWA programs from other states, 2) utilize the research to develop recommendations for improving Washington State’s WQA, listing/de-listing, and TMDL procedures, and 3) work with EPA and Ecology to refine and implement many of the recommended improvements.

Recommendations include:

1) Establish a multi-stakeholder Standing Committee to improve coordination and engagement with the regulated community
2) Implement existing regulatory authority related to unpermitted and nonpoint sources
3) Refine water quality standards and water quality assessment methodologies
4) Improve and employ consistent processes for collecting, assessing, and utilizing credible data in WQA and TMDL development
5) Refine water quality assessment categories to improve clarity and aid in defining priority water bodies
6) Update the current biological assessment and listing methodology
7) Define TMDL prioritization methodology, timelines, and process for public involvement
8) Define TMDL development methodology
9) Develop consistent TMDL implementation expectations

Presentation Learning Objectives/Outcomes: Implementation of Clean Water Act programs to assess waters for impairment and develop clean-up plans (TMDLs) pose substantial administrative, technical, financial, and legal challenges for federal/state/local agencies and stakeholders. Implementation of TMDLs can entail huge costs, major land use restrictions, and increased risk of third-party legal challenges for those that must meet these requirements through their stormwater NPDES permits. We seek to inform stakeholders of a project to compare and contrast Washington State’s water quality assessment and TMDL programs with other states and the resulting recommendations proposed to Ecology. The goals are to improve accuracy, transparency, predictability, and consistency of decision making, leading to improvements in water quality and use of public resources.
1PM – 2:30PM

Track 1 – Two Discussions on Regional Approaches to Stormwater Management

Location: To-be assigned

Track 1A: Re-envisioning Treatment and Flow Control in Tacoma - The Regional Approach

Presenter: Dana de Leon, P.E., City of Tacoma, Environmental Services. Dana de Leon is a professional engineer at the City of Tacoma Environmental Services Department. Dana is a chemical engineer with 27 years of experience in stormwater studies related to quality/quantity studies, source control, NPDES regulatory issues, and stormwater treatment technologies. Dana’s main focus is stormwater source control, fate and transport of stormwater contaminants, and stormwater treatment.

Abstract: Redevelopment in Tacoma can be complex in our highly urbanized area. The complexities are driven by limited space, aging infrastructure, and lower rents in comparison to other urban areas. Ease of development and more lucrative rents can drive development elsewhere. Tacoma has developed a Draft Regional Stormwater Facilities Plan where Minimum Requirements (MR) #6 Water Quality Treatment and MR #7 Flow Control as defined in Tacoma’s NPDES Phase I Municipal Stormwater Permit and our 2012 Stormwater Management Manual (Volume 1: Sections 3.4.6. and 3.4.7) would be met by using regional systems in lieu of constructed individual on-site facilities for development/redevelopment projects. The Draft Plan is under review by WA State Department of Ecology.

Presentation Learning Objectives/Outcomes: This presentation provides permittees with alternatives for meeting Post-Construction Stormwater Management for New Development and Redevelopment requirements in the NPDES Municipal Stormwater Permits: W. WA Appendix 1: MR #6 Water Quality Treatment and MR #7 Flow Control, and E. WA 5.a.i.b.2 and Appendix 1: Core Element #5 Runoff Treatment and #6 Flow Control. The benefits of a Regional Stormwater Facilities Plan are: retrofits larger areas faster than would occur under normal new development/redevelopment, resulting in flow and pollutant load reductions to receiving waters; uses economy of scale to get best unit price for both construction and operations and maintenance (O&M); supports development through in-lieu programs; provides developers with certainty regarding requirements, costs and timeline; and targets the most sensitive receiving waters.

Track 1B: Using an Ecological Recovery Approach to Stormwater Permit Regulations,

Presenters: Andy Rheaume, City of Redmond, Senior Planner (with Ed O’Brien, Department of Ecology; Heather Ballish, Department of Commerce; and John Lenth, Herrera Environmental Consultants). Over the last six years, Andy Rheaume has been developing an innovative, alternative approach to the default permit requirements for stormwater management that is expected expedite the recovery of streams in
urbanized watersheds. Andy’s efforts culminated in the development of Redmond’s Citywide Watershed Management Plan which was subsequently approved by multiple stakeholders, including Ecology. In recent years, Andy has been involved in regional collaboration to foster the adoption of this alternative approach and monitor its effectiveness in priority watersheds where stormwater runoff treatment, LID, and flow control facilities will be constructed using current design standards at an accelerated pace.

Andy has 14 years of stormwater management experience in various capacities, and has a BS in Environmental Sciences from the University of Washington.

Abstract: The municipal stormwater permits establish minimum requirements for permittees to address stormwater impacts from new development and redevelopment through the implementation of programmatic and structural best management practices (BMPs). In theory, if these BMPs are applied to all the developed land in a watershed, the receiving water would be protected from stormwater related hydrologic and water quality impacts. While the effectiveness of stormwater BMPs has been well-documented on the site scale, limited data exists nationally on the effectiveness of these controls in aggregate for actually protecting conditions in receiving waters.

In February 2014, Ecology approved a Citywide Watershed Management Plan (WMP) for the City of Redmond (City) that allows use of a watershed approach for implementing required stormwater BMPs pursuant to the municipal stormwater permit. This approach is an alternative to applying the default approach to stormwater management throughout Washington. Through the implementation of this WMP, the City will establish a fee-in-lieu program that will allow investments in stormwater BMPs to occur using private and public funding. The City will focus these investments in a subset of priority watersheds that are moderately impacted by urbanization and therefore expected to respond more quickly to rehabilitation efforts. The WMP also creates a careful decoupling of where redevelopment occurs and where stormwater controls/infrastructure are installed.

Recognizing the importance to create healthy aquatic ecosystems in urbanized areas, Redmond’s WMP has become an example of how using an alternative approach has more potential to recover aquatic habitat while supporting development of dense urban centers for expected population and job growth. Due to this dual nature, this alternative has fostered an alliance of state agencies and local governments to create tools to assist stormwater permittees in developing alternative local regulations that simultaneously address stormwater management, aquatic ecosystem recovery, and development of urban centers. This presentation will include an overview of Ecology's Stormwater Control Transfer Program Guidance, developed to support local jurisdictions.

The implementation of this approach provides a unique opportunity to study the effectiveness of stormwater BMPs for improving receiving water conditions on an accelerated time frame. The City is implementing a study to quantify improvements in receiving water conditions based on routine and continuous measurement of various hydrologic, chemical, physical, and biological indicators of stream
health. This study will utilize a “paired watershed” experimental design. This study will initiate in the fall of 2014 and will be implemented over an anticipated ten year timeframe with funding from Ecology’s Regional Stormwater Monitoring Program.

Over the next ten years, the implementation of Redmond’s WMP and the effectiveness study will provide valuable feedback to federal, state and local governments regarding the benefits of stormwater BMPs and their application across an urbanized small stream watershed.

Presentation Learning Objectives/Outcomes: This presentation will benefit both Eastern and Western Washington permittees by illustrating an alternative approach to the default stormwater regulations that allows greater flexibility for directing some of the required stormwater controls for redevelopment projects to priority watersheds where they will provide greater benefit. This approach is expected to rehabilitate moderately impacted streams at a lower cost and on a shorter frame relative to what can be expected through the defaults stormwater regulations. Tools from this presentation will include an overview of the stormwater control transfer program guidelines, a discussion of Redmond’s experience developing and implementing the program, and a summary of efforts currently underway to monitor the effectiveness stormwater BMPs for restoring streams in priority watersheds where this approach is being applied.

Track 2 – Three Discussions on Technical Tools for Asset Management and Operations – Real Examples from Permittees

Location: To-be assigned

Track 2A: Utilizing Asset Management Data Based Systems to Meet NPDES Requirements

Presenters: Don Robinett, City of SeaTac, Stormwater Compliance Manager. Ryan Tarbet, Azteca Systems, Inc., Asset Management Specialist. Don has a Master’s Degree from the Program in Environmental Science and Regional Planning – WSU, Bachelor in Communications/Public Relations – WSU, Certified Professional in Erosion Sedimentation Control, 20 years of experience in the stormwater industry, and over seven years managing municipal NPDES compliance for Phase II jurisdictions. Ryan has a Master’s Degree from UC Davis Graduate School of Business, a Geographic Information Systems B.S. Degree from UC Davis, Environmental Biology & Planning, 15 years of experience in local government GIS and asset management consulting services, and 5 years Asset Management program director for public utility.

Abstract: One of the most time consuming, and at times, exhausting requirements of the municipal stormwater permits is the need for program tracking and reporting. While most jurisdictions have
permit tracking data base systems, many have not implemented this technology in their operations and maintenance (O&M) or illicit discharge detection and elimination (IDDE) programs. This presentation will provide detailed examples of how the City of SeaTac is utilizing a GIS integrated asset management data base system to help meet its NPDES tracking and reporting requirements. Customized NPDES forms and reports that will be presented include: Private and Public Stormwater System Inspections, Spill Hotline and IDDE Investigation, IDDE Field Screening and Catch Basin Inspections. The presentation will focus on demonstrating how jurisdictions can utilize asset management data base systems to not only simplify annual tracking and reporting, but also help to direct management decisions on NPDES programs (i.e. identify target areas for IDDE and stormwater educations programs based on mapping of illicit discharges).

- Why is it important? – Data base systems are a useful tool which can be used to streamline NPDES tracking and reporting requirements.
- Outcomes? – Consistent and efficient access to tracking and reporting data. This approach also has broader implications for NPDES program and surface water utility management.
- Challenges/lessons learned? – Garbage in garbage out. Clarifying roles and responsibilities for entering data; and maintain high level of oversight for the first year.
- Applicability? – This approach to NPDES compliance can be useful to any permittee with O&M and IDDE tracking and reporting requirements and can be applied to most GIS linked asset management database systems.

Presentation Learning Objectives/Outcomes: This presentation will provide detailed examples of how the City of SeaTac is utilizing a GIS integrated asset management data base system to meet NPDES tracking and reporting requirements more efficiently. Customized NPDES forms and reports that will be presented include: Private and Public Stormwater System Inspections, Spill Hotline and IDDE Investigation, IDDE Field Screening and Catch Basin inspection. The presentation will focus on demonstrating how jurisdictions can utilize asset management data base systems to not only simplify annual tracking and reporting, but also help to direct management decisions on NPDES programs (i.e. identify target areas for IDDE and stormwater educations programs based on mapping of illicit discharges).

Track 2B: Private Facility Inspections: From Paper to High Definition

Presenters: Jennifer Adams, City of Shoreline, Surface Water Quality Specialist. Ms. Adams coordinates the City of Shoreline’s NPDES Permit. She also develops and implements Shoreline’s private stormwater facility inspection program, conducts IDDE investigations, and educates property owners on these issues. She brings a unique mix of experience in outreach to residential landowners and water quality expertise to the program.
Abstract: NPDES Municipal Stormwater Permittees are required to inspect private stormwater facilities for maintenance purposes. Challenges in this type of inspection program can include: a growing workload with new development, communicating effectively with private property owners, and inaccurate mapping. Finding ways to streamline an inspection program that eases all of these challenges could benefit many permittees. This presentation will show how the City of Shoreline’s implementation of a GIS-based asset management system streamlined its inspection program.

In 2013, the City of Shoreline implemented a GIS-based asset management system, moving the inspection program from a paper process to one based in GIS technology. The inspection program includes approximately 300 privately owned stormwater facilities, making the old method of institutional knowledge and Excel spreadsheets cumbersome. The new asset management system has streamlined the field inspection and communication processes.

Because the private facility inspection process is not a standard Inspection-to-Work Order process, tracking inspection findings, relaying them to landowners, and tracking compliance was administratively time consuming. Now, inspection findings are directly related to mapped assets, reducing the need to sift through hard files. Property owners seem to have a better understanding of their system through the GIS maps provided them. And administration time has been reduced with automated reports to property owners.

Field inspections used to be completed with a binder of hand-drawn maps, jotting notes on generic field forms, then transferring information to spreadsheets in the office. Too much field staff time was spent finding lost features using not-to-scale maps because hand drawn maps were difficult to update and navigate. Now, field inspectors are equipped with mobile devices, using maps from an up-to-date GIS inventory. Individual features are shown in relation to aerial photos, and structure details are available with the click of a button.

With the prospective proliferation of smaller on-site BMPs and facilities, future iterations of the inspection program must be agile. Lessons learned with the initial configuration process suggest that this process will have the flexibility needed to achieve success.

Presentation Learning Objectives/Outcomes: An Asset Management System can be one tool for permittees to use in managing a private facility inspection program (a growing requirement under the NPDES permit). Through the use of a GIS-based asset management (AM) system, the City of Shoreline has been able to streamline its own inspection program. Efficiencies include: better understanding of the entire stormwater system through an updated GIS asset inventory, managing all landowner correspondence in the AM system, having answers to follow-up questions at your fingertips, and generating reports on past performances of a facility. While some custom reports were required, this up front cost allows us to easily track ever-changing contact information and report inspection findings. The
City is still refining the process after one cycle of implementation, but has found that less time is spent tracking down information.

**Track 2C: Outfall and Discharge Point Screening Application**

**Presenters:** Mark Preszler, King County (with Jeanne Dorn, King County, and Brett Randle, King County). Mark is the coordinator of King County’s NPDES Stormwater Mapping and Information Management Programs. He has over fifteen years of experience in GIS, remote sensing, spatial analysis and modeling, database management, and software development, particularly as it applies to the management of natural resources and decision support systems. Jeanne Dorn is a Water Quality Project/Program Manager III with King County Stormwater Services Section/Water Quality Compliance Unit. She leads various illicit connection and illicit discharge programs, including the conveyance screening program and the fecal coliform total maximum daily loads (FC TMDLs) specified in the 2013-2018 Permit. Brett Randle is the Mapping Editor of King County’s NPDES Stormwater Mapping and Information Management Programs. He has five years of experience in GIS and environmental science related to streams.

**Abstract:** In order to meet requirements within the Phase I NPDES Municipal Stormwater Permit, King County created a mobile application for screening, collecting, and reclassifying its outfalls and discharge points. The application, called the Outfall and Discharge Point Screening Application (App), is based on the new outfall and discharge point definitions recently proposed by the Washington State Department of Ecology. King County recognizes that entities subject to shared permit requirements can benefit from regional integration of stormwater data management and collaborative development of tools that meet shared, regional business needs. For these reasons, King County supplies this Application package to any interested jurisdiction upon request.

The Application can assist jurisdictions in meeting their conveyance screening and mapping permit requirements. The Application directs staff to mapped outfalls, then to reclassify these features under the new outfall and discharge point definitions. The Application also enables staff to add new outfalls and discharge points, as well as move existing locations based on GPS, aerial imagery, or base maps. The Application operates within the ESRI Collector App, which is freely available for iOS and Android devices. The Collector App provides driving directions to individual points and GPS location awareness so that field staff may orient themselves on the mapping device. Users may also add supporting data layers to the map display, such as wetland areas, stormwater drainage, stormwater facilities, streams, and land ownership data to facilitate accurate classification of outfalls and discharge points. Users can upload attachments, providing a streamlined method for pictures and assorted documents to reside in the spatial database for easy access.
Presentation Learning Objectives/Outcomes: This presentation benefits permittees in Washington by demonstrating how shared data structures and mapping applications add an ease and efficiency to stormwater mapping for permit requirements. This discussion presents permittees with a field data collection application which operates through ESRI ArcGIS Online, or can be adapted to another customized interface. King County is employing this application in support of outfall and discharge point screening requirements found in the Phase I NPDES Municipal Stormwater Permit. This presentation identifies specific challenges and lessons learned in developing modern mapping applications in support of permit requirements and deadlines, and within budget constraints. This application greatly improves the efficiency of municipal permit compliance by offering a mobile product for screening and mapping outfalls and discharge points.

Track 3 – Finding and Eliminating Illicit Discharges – Lessons from Two Regions

Location: To-be assigned

Track 3A: Alternative Fecal Coliform and Stormwater Testing Methods

Presenters: Simon A. Smith, University of Idaho, Research Scientist (with Rob Buchert, City of Pullman, and Shilo Sprouse City of Pullman). Simon has extensive practical wastewater experience and is a Certified Level 4 Domestic WWTP Operator (WA). In addition to his wastewater treatment and water purification experience, he has more than ten years of experience in the plastics, pharmaceutical, and ceramics manufacturing fields. He also has a solid theoretical foundation with a Doctorate in Engineering Science (WSU), MS in Water Utilization (Pretoria), and BS in Microbiology (Cape Town). Last year Simon joined the University of Idaho, Resource Recovery Laboratories of Dr. Erik R. Coats as a Postdoctoral Fellow. In 2009 the City of Pullman commissioned Simon’s company Worldthree llc to help measure fecal coliforms in one of its stormwater monitoring projects. Several novel technologies were developed during this and subsequent studies, and as Worldthree llc is committed to open source, Simon shares these freely.

Abstract: The City of Pullman (WA) has an active stormwater management program focused on improving water quality, infrastructure, and public awareness, to facilitate compliance with NPDES Phase II MSP requirements. One of the program’s water quality priorities is to reduce the fecal coliform (FC) counts entering its stormwater collection system, and the City has performed several stormwater system monitoring studies to achieve this goal. Many simple tools and methods have been developed during the Pullman study, and as other stormwater managers and operators face similar hurdles, this presentation shares the insights and lessons of the Pullman study.
For instance, FC measurement can become expensive, particularly when large numbers of samples are collected, and while it is essential to use a standard FC method when monitoring system performance for regulatory purposes, simpler and cheaper FC methods allow more detailed coverage during initial system assessments. This presentation will show attendees how to perform the simplified, quick, and cheap FC screening test used in the Pullman study.

Stormwater technicians measure water flow when collecting samples so they can calculate the load at each sampling point. Many different flow measurement devices are commercially available, but this presentation will describe four alternative flow measurement methods tested during the Pullman study. These alternative methods can be used to corroborate traditional methods, and are quick, cheap, and provide a permanent record of the sampling conditions.

In addition to sharing methods of FC- and flow-testing, the presentation will also share techniques to collect more accurate precipitation data, and show stormwater technicians how to build their own sampling tools from cheap and widely available materials.

Presentation Learning Objectives/Outcomes: We will show attendees a variety of accurate, simple, and cost effective tools and methods we developed during the City of Pullman stormwater studies. We will also demonstrate four different water flow measurement techniques that can be performed with devices such as cell phones, or that can be built with materials costing less than $100.

Track 3B: The Sweet Smell of Success: Finding and Eliminating Illicit Connections in Seattle

Presenter: Adam Bailey, City of Seattle. Adam graduated from Western Washington University with a degree in Natural Resource Management and has been working in the environmental field for the past 12 years. Adam has previously worked in a number of positions before discovering his one true love: Illicit Discharge Detection and Elimination which he has been happily conducting for the past 5 years with great success for the City of Seattle.

Abstract: Illicit Discharge Detection and Elimination (IDDE) is a permit stipulation that all NPDES Phase 1 and 2 permittees are required to meet. While many municipalities and counties have had limited success in locating sources of pollution through their respective IDDE programs, the City of Seattle has had great success in locating and eliminating scores of cross connections by utilizing a different approach to IDDE which is both basic and thorough. Analyzing for basic parameters and intensive sampling (taking numerous sample points at strategic junction points in a drainage system) has proven to be very effective in locating pollution sources which would not likely have been discovered through outfall screening. The City’s approach in eliminating cross connections by working with homeowners and
businesses through a code compliance process has also been successful. Other highly urbanized Phase 1 and 2 permittees may find these approaches useful in eliminating pollution as well.

To date, the City of Seattle’s IDDE team has located and eliminated over 100 individual cross connections. Discoveries range from a South Seattle housing development with over 50 cross connections with discharge to a popular swimming beach to a sausage factory discharging sewage and process wastewater to the Duwamish River. In all these discoveries, the city was able to work constructively with the responsible party/parties to have the repairs made due to a streamlined and well-defined process leading to a 100% compliance rate.

Considerable work goes into sampling, source tracing, locating and eliminating illicit connections and each one of the aforementioned processes offers unique challenges and the presentation will address each of these processes and the tools we use to address the challenges associated with each process. Drawing conclusions from conflicting sampling data, notifying a homeowner of a costly repair and working to locate a cross connection from a large hospital are just a few of the challenges we’ve faced in the past 5 years.

Presentation Learning Objectives/Outcomes: The presentation will benefit permittees in that it will outline the approach the City of Seattle takes in conducting IDDE, which is both simple and thorough. This approach has proven to be effective and the presentation will explain this process and why it works noting program specifics and interesting case studies. The presentation will also outline challenges with each unique aspect of the program and how the City has addressed these challenges. It is the hope that other Phase 1 and 2 permittees will find the City of Seattle IDDE program or aspects of the program useful in eliminating pollution sources in their respective city or county.

2:30PM – 3:30PM

Track 1 - A Direct-to-Implementation approach to toxics reduction in the Spokane River

Location: To-be assigned

Presenters: Lynn Schmidt, City of Spokane, Stormwater Permit Coordinator. Adriane Borgias, Department of Ecology, Water Quality Lead for the Spokane River. Lynn Schmidt, PE, is the Stormwater Permit Coordinator for the City of Spokane Wastewater Management Department, where she coordinates compliance activities under the Phase II Municipal Stormwater NPDES Permit, the City’s PCB Adaptive Management Plan, and the City’s involvement in the Spokane River Regional Toxics Task Force (SRRRTTF). Adriane Borgias, Department of Ecology, works to further the efforts of the SRRRTTF with the goal of reducing toxics in the river. She previously worked in the energy industry, for the Kootenai Tribe of Idaho, and as a private consultant. She has a degree in Chemistry from UC Berkeley and a Masters in
Environmental Science from the University of San Francisco. In 2010 she spent 4 months in Bangalore, India, as a Fulbright-Nehru Environmental Leadership Scholar.

Abstract: The Spokane River community has engaged in an innovative direct-to-implementation approach to address toxics in the watershed. Collaboration with other entities on a watershed scale is a cornerstone of making progress in toxics reductions. Local municipal and industrial dischargers along with regulators, state entities, and environmental organizations formed the Spokane River Regional Toxics Task Force (SRRTTF), a direct-to-implementation alternative to the traditional TMDL process. Its vision statement is to “work collaboratively to characterize the sources of toxics in the Spokane River and identify and implement appropriate actions needed to make measurable progress towards meeting applicable water quality standards.” Much of the focus of the SRRTTF has been on polychlorinated biphenyls (PCBs), a carcinogenic, manmade toxic that has been identified ubiquitously throughout the environment. PCBs have been identified as a “legacy contaminant,” but are also still incidentally generated in manufacturing processes at concentrations up to a billion times greater than water quality standards.

Currently the majority of the PCB loading to the Spokane River is unaccounted for and work is underway to identify and fill these data gaps in the watershed. In addition, one goal of the SRRTTF is to address the issue of relatively high PCB concentrations allowed in products versus stringent water quality standards. Each of the municipal and industrial dischargers are investigating PCB sources in their own systems.

The City of Spokane is actively engaged in the SRRTTF and is working to make measurable progress in reducing toxics in its stormwater, combined sewer, and wastewater systems. An adaptive management plan was implemented to identify PCBs in stormwater and catch basin sediments in a heavy industrial area of the City. The City also submitted an Integrated Clean Water Plan, which holistically addresses clean water regulation through prioritized public works projects. PCBs are a contaminant of concern addressed in the Integrated Clean Water Plan.

This joint presentation by the Department of Ecology and City of Spokane will describe the innovative direct-to-implementation approach, formation of the SRRTTF’s organizational concepts and structure, and an example of one Phase II stormwater permittees’ efforts towards toxics reductions in stormwater.

Presentation Learning Objectives/Outcomes: The objective is to demonstrate an innovative direct-to-implementation approach to pollutant reduction on a watershed scale as an alternative to a traditional TMDL. The presentation focuses on efforts undertaken in the Spokane River watershed as an example, including the City of Spokane’s Integrated Clean Water Plan and toxics reduction efforts in its stormwater system. The direct-to-implementation approach may be applied to any pollutant in any watershed across the state. This example is a particularly complicated case as PCBs are ubiquitous, persistent toxics and the Spokane River crosses state boundaries.
Track 2 - City of Tacoma’s Catch Basin Assessment Program

Location: To-be assigned

Presenter: Michael Rose, City of Tacoma, Associate Engineer. Michael A. Rose, E.I.T. is an associate Engineer with the City of Tacoma with over 8 years of experience in storm and sanitary systems. Mike received a BA in Business Administration from Eastern Washington University and spent 3 years study in engineering. Mike has spent years working with multi-function teams developing databases and management systems with the overall goal of making data collection and compliance easy and efficient.

Abstract: The City of Tacoma has done extensive work developing programs to track maintenance and forecast work in many areas of maintenance; however, when it came to catch basins the City’s program had missed the boat. The city realized the deficiency during a source tracing incident and an internal audit of our programs which identified a need to better track catch basin cleaning. In response to this need, the City of Tacoma has developed a fast, reliable, GIS Integrated program, which meets our needs for source tracing and compliance with Phase 1 NPDES permit catch basin operations and maintenance. The program provides clear and transparent GIS integrated goals which are available for all to view.

Our program consists of various web pages which allow a user to input data, search for information, and check the progress of the program as whole. All elements are tailored to the user and are intended to be fast and easy to use. The programming was developed in house using HTML, C++, and SQL languages and tables. The development of the program focused on integration with GIS, gathering core information needed (inputs) to get desired information (outputs), playing devil’s advocate throughout, and working all processes to the end. In the end we spent a few months with minimal labor and were able to produce a product that met our needs.

The human element became one of the greatest obstacles and assets through development. Humans want to succeed, sometimes too a fault. Crews would often do their best to make the program work rather than report that a program component didn’t work. It took some time, but in the end understanding our field users became our biggest asset to success. In addition through involving field users in the development of the program, crews developed a sense of ownership and pride in their work, which helped to bridge the gap between management and field staff.

Our next steps are to expand this program from catch basins to other types of storm assets (cartridge filters, detention facilities, etc.) and create seamless integration with other programs. We are currently working one asset type at a time with an end goal of having one repository for all assets and their condition. Integration with other programs will allow for process efficiencies, like field staff identifying a source control issue (such as oil in a basin), followed by an automated notification to the Source Control Inspector allowing inspectors to begin their inspection with all of the pertinent information already
populated. This automation will save time and reduce redundancy and potential conflicts in data collection. This program has been a huge success and has allowed us to save time, save resources, and meet our compliance needs.

**Presentation Learning Objectives/Outcomes:** Topics included in the presentation display methods and techniques used to develop a system to meet Phase 1 NPDES compliance for Catch Basin operation and maintenance. This system could be applied to other areas of compliance and work flow management necessary to operate a successful NPDES program. Permittees will gain the experience of years of work from multiple groups and gain knowledge from lessons learned through the process of developing this element of the City’s NPDES program. This program has been a huge step forward in efficiency and focuses on inputs and the necessary results while eliminating redundancies.

**Track 3 – Illicit Discharges, Fecal Coliform, and TMDLs – Lessons from King County**

**Location:** To-be-assigned

**Track 3A – Pilot Testing of New Techniques for Illicit Discharge Detection**

**Presenters:** Debra Bouchard, King County, WQ Planner III; Jeanne Dorn, King County, WQ Project/Program Manager III. Debra Bouchard is a Water Quality Planner III with the County's Science and Technical Support group. She is the program lead for the Routine Streams Monitoring Program, Source Tracking Pilot Studies, and the summer Swimming Beach Monitoring Program. Jeanne Dorn is a Water Quality Project/Program Manager III with the County’s Stormwater Services. She is the program lead for various illicit connection and illicit discharge programs, including the conveyance screening program and the fecal coliform total maximum daily loads (FC TMDLs) specified in the 2013-2018 Phase I NPDES Municipal Stormwater Permit.

**Abstract:** King County, the City of Seattle, and the City of Kirkland collaborated on field testing canine scent tracking in Thornton and Juanita Creek watersheds in May 2014 - combining the two urban creeks into one study design. Canine scent work results will be compared against laboratory analytical results to evaluate scent tracking reliability. Lab analytical tests included fecal coliform culture methods and Bacteroides in qPCR methodology. The qPCR methods (molecular-based) are themselves currently undergoing preliminary and ongoing evaluation in various County and City programs to determine their effectiveness as source identification and source tracking methods. qPCR methods include tests to identify human-related Bacteroides species, cow- and beef cattle-related Bacterodales species, and ruminant-related Bacterodales species (elk, llama, goat, etc.). Over 50 samples were analyzed in each basin.
Additionally, King County and the City of Kirkland collaborated in June 2014 on field testing a rapid field fecal coliform/E. coli detection method (Mobile Water Kit or "MWK") developed by researchers at the University of Alberta. MWK tests were run on samples from four general areas of King County and City of Kirkland. Laboratory analyses were also run to compare against MWK results, to assess the reliability/usability of MWK for use as a tool to identify high bacterial levels in surface waters and stormwater. Field pilot test results indicate that more work is needed to refine the MWK field technique to facilitate field use, and to enable differentiation between wide ranges of bacterial levels in water. If these refinements are made (possibly through more collaboration with King County and/or the City of Kirkland) the MWK could be a valuable field tool for helping to rapidly identify bacterial exceedances.

Presentation Learning Objectives/Outcomes: The pilot field tests to be presented could help refine new techniques of identifying sources of high bacteria in surface waters and stormwater conveyance systems. No actual tools are as yet recommended, but the ongoing piloting work will be presented. Some lessons learned about these potential tracking tools will be included. If these tools are improved to a high degree of reliability and if costs associated with per-use are lowered, municipal stormwater permit compliance may be increased (faster identification of illicit connections/illicit discharges).

Track 3B – Fecal Coliform TMDL Bacteria Source Screening: Approaches by King County

Presenter: Jeanne Dorn, King County, WQ Project/Program Manager III. Jeanne Dorn is a Water Quality Project/Program Manager III with the County’s Stormwater Services. She is the program lead for various illicit connection and illicit discharge programs, including the conveyance screening program and the fecal coliform total maximum daily loads (FC TMDLs) specified in the 2013-2018 Phase I NPDES Municipal Stormwater Permit.

Abstract: Appendix 2 of the 2013-2018 Phase I NPDES Municipal Permit requires that King County performs specific tasks related to fecal coliform total maximum daily loads (FC TMDLs). King County Stormwater Services Section has begun implementing a bacteria source screening program in the first of its Appendix 2 FC TMDL areas, the Puyallup River Watershed. Appendix 2 requires that King County designate areas discharging via its MS4 to Boise and Jovita Creeks as high priority areas for illicit discharge detection and elimination. The presentation will describe technical approaches, including mapping research and sampling and analysis work plans, as well as successes and findings up to autumn 2014. The presentation will also describe collaborative efforts between King County sections including Stormwater Services, Science & Technical Support and Rural and Regional Services, in addition to Public Health - Seattle & King County, and the Washington State Department of Agriculture.

Presentation Learning Objectives/Outcomes: Attendees may benefit from specific technical approaches to bacteria source screening in King County’s Puyallup Watershed fecal coliform total maximum daily load (FC TMDL), including its overall work plan, mapping research, and screening and sampling methods.
Attendees may also learn from inter-agency collaborations begun by Stormwater Services Section, including cooperating with King County's Rural and Regional Services Section, King County's Science & Technical Support Section, Public Health Seattle-King County, King Conservation District and the Washington State Department of Agriculture.

3:30PM – 4:30PM

Track 1 - Innovative Partnerships to Achieve and Exceed NPDES Permit Requirements

Location: To-be assigned

Presenters: Kate Riley, Snohomish Conservation District, Program Manager; Teresa Brooks, Kitsap CD; Melissa Buckingham, Pierce CD; Kara Kaelber, Franklin CD; and their associated partner jurisdictions.

Abstract: Partnering with a Conservation District has enabled many jurisdictions to not only meet but exceed their permit requirements, by creating forward-thinking programming within their communities. The four conservation districts represented have relationships with almost twenty Phase I and II jurisdictions in Washington, and are successful because of their cost-effective services, access to private landowners, and innovative outreach strategies. Conservation Districts are known for being the ‘Boots on the Ground’, as shown by the project examples in this presentation, including the ‘I Love the Lake’ campaign in the City of Lake Stevens, the Green Streets initiative in Kitsap County, the DePave program in Pierce County, and the educational programs of ‘Wheat Week’ and ‘Water on Wheels’ in Eastern Washington. Conservation Districts are committed to serving their municipalities, often times facilitating additional strategic partnerships, leveraged funding, and long-term community engagement.

Presentation Learning Objectives/Outcomes: The main objective of this presentation is to demonstrate the diversity of ways that jurisdictions can benefit from collaborating with their local Conservation District. We will discuss funding and partnership opportunities, unique incentive programs, and outreach strategies. Permittees will learn about several successful programs that can meet more areas of the permit, and work towards lasting change in their communities.

Track 2 - Building a Comprehensive Stormwater Retrofit Program

Location: To-be assigned

Presenter: Scott Murphy, Kitsap County, Stormwater Retrofit Engineer. Scott Murphy is a licensed civil engineer working for Kitsap County Public Works, Stormwater Division. He received his Bachelor’s
degree in Civil Engineering from the University of Washington. Scott is currently the lead engineer for Kitsap County’s stormwater facility retrofit program and is focused on incorporating Green Stormwater Infrastructure into the majority of Kitsap County’s stormwater retrofit projects.

Abstract: In June of 2009, the Kitsap County Commissioners adopted the “Water as a Resource” policy which recognized storm and surface water runoff as the leading transport medium of pollution into Puget Sound and its associated wetlands, creeks, streams and rivers. Additionally, local groundwater studies indicate that 80% of Kitsap County citizens obtain their drinking water from groundwater resources and these are only replenished by the infiltration of precipitation that falls on Kitsap County. This has caused us to expand and restructure our retrofit program to address these challenges and help ensure that we will have clean and adequate water resources to accommodate future growth. The Kitsap County, Department of Public Works, Stormwater Division is responsible for more than 600 stormwater facilities and the associated infrastructure. Many of these assets were created during an era when removal of pollutants and flow control was not adequately addressed thereby adversely impacting our local waterways. Through our stormwater retrofit program, many of these facilities are being altered to improve water quality, reduce runoff, and restore a more natural hydrology to our facilities through infiltration.

This Presentation will focus on the following topics:
1) Developing effective multi-agency partnerships: Clean Water Kitsap is a multi-agency collaborative effort between Kitsap County Public Works, Kitsap Public Health District, Kitsap Conservation District, Washington State University, and private land owners. These partnerships allow us to better meet our goals and policies, share ideas, and to evaluate and research new and emerging technologies.

2) Essential elements of a comprehensive and effective retrofit program: Our retrofit program encompasses many elements:
- Community based retrofit studies and plans.
- Reconfiguration and vegetative enhancement of regional and neighborhood ponds.
- Evaluation and selection of local access roads to receive a “Green Streets” treatment.
- Replacement and enhancement of aging and deteriorated infrastructure.
- Slope stabilization and erosion control projects.
- Localized projects to correct drainage deficiencies and minor flooding as identified through drainage studies and customer requests for action.

3) Developing manuals and guides: Kitsap County has or is working with various consultants to develop the following retrofit design guidance manuals for use internally and by other agencies and individuals.
- Roadside Ditch and Shoulder Water Quality Enhancement Plan.
- Kitsap Green Streets Plan.

4) Program funding and expenditures:
- Annual property based stormwater program fees.
- Washington State Department of Ecology grants.
- Allocation of funds.
5) Project examples and lessons learned: Some photos and discussion of a variety of retrofit projects, measuring the overall success of the project and lessons we’ve learned along the way which have guided elements of our project design and construction methods.

Presentation Learning Objectives/Outcomes: The learning objectives for this presentation are how to incorporate various program elements and strategies in order to develop, grow, and maintain an effective stormwater retrofit program which will produce lasting benefits for the environment and the community. The desired goal of this presentation is to leave the audience with examples of program guidance manuals, successful projects, and community benefits which have resulted from Kitsap County’s approach to building a comprehensive stormwater retrofit program.

Track 3 - Results from Current Research on Pollutant Export from Bioretention Systems and Next Steps

Location: To-be assigned

Presenter: Chris May, Kitsap County Public Works, Stormwater Division Senior Program Manager (with Andy Rheame, City of Redmond; Doug Howie, Department of Ecology; and Curtis Hinman, Dylan Ahearn, and John Lenth – Herrera Environmental Consultants). Dr. Christopher W. May is a freshwater ecologist and environmental engineer with expertise in urban watershed assessment and management. Currently, he is the Senior Program Director of the Kitsap County Public Works, Surface and Stormwater Management (SSWM) Program. Prior to joining the Kitsap County SSWM team Dr. May was a senior research scientist and engineer at the Battelle Marine Sciences Laboratory (MSL) and, before that, a research engineer at the University of Washington Applied Physics Laboratory (UW-APL).

Abstract: Infiltrating stormwater onsite helps achieve the objective of low impact development (LID) – to more closely mimic pre-disturbance hydrology. Bioretention and rain gardens are two of the most common onsite best management practices (BMPs) used to meet the objectives of LID due to their hydrologic benefits. Early research from the east coast also indicated that these BMPs provide pollutant reduction benefits. However, regional and national research indicates nitrogen (N), phosphorus (P), and copper (Cu) may be exported from these systems. The sources of N, P, and Cu can come from various materials including compost, mineral aggregates, and natural and engineered amendments.

Following the release of this research, the Washington State Department of Ecology (Ecology) provided new guidance in March 2013 that proposed restrictions for installing bioretention facilities with underdrains that would discharge directly to surface waters. Ecology also indicated more detailed assessment of potential groundwater quality impacts might be needed where multiple bioretention facilities would discharge over public drinking water supplies. Ecology’s long-term strategy involved the financing of additional studies on bioretention soil media (BSM) to prevent or reduce the export of these pollutants. Two of these studies are being implemented by Kitsap County and the City of Redmond, respectively,
with funding from separate Grants of Regional and Statewide Significance (GRSS) through Ecology. The Kitsap County study involves pilot scale testing of different BSMs in columns to meet the following objectives:

- Analyze the ability of individual bioretention soil media components to resist leaching N, P, and Cu using weak acid and deionized water extraction.
- Analyze media blends for the ability to capture and retain N, P, Cu, and other stormwater pollutants of concern by flushing and dosing media columns (the ability of the media blends to support vegetation will also be assessed).
- Provide recommendations for additional BSM research needed to address unresolved water quality treatment or hydraulic performance issues.

The City of Redmond study involves testing in six full-scale bioretention systems to confirm the results from previous studies and investigate alternative BSMs. Four of these bioretention systems were constructed in connection with improvements to the City’s Maintenance and Operations Center Decant Facility. The remaining two systems were constructed in connection with a later phase of the 185th Street Extension Project.

Results from both studies confirm the results from earlier studies that showed export of N, P, Cu during an initial “flushing period” from the default BSM. Both the sand and compost that are used to construct the default BSM appear to be sources for one or more of these pollutants. Through these studies, several alternative components for potential use in constructing BSMs have now been identified that show less potential for pollutant export.

Presentation Learning Objectives/Outcomes: While bioretention has been shown to provide good water quality treatment for many contaminants, research conducted by the City of Redmond and the Washington Stormwater Center indicated nitrogen, phosphorus, and copper may be exported from these systems. Following the release of this research, the Washington State Department of Ecology issued proposed restrictions for siting bioretention systems in March 2013 that were intended to limit potential impacts on surface water and groundwater from these pollutants. Ecology’s long-term strategy involved the financing of additional research on bioretention soil media (BSM) to prevent or reduce the export of these pollutants. This presentation would provide an update for permittees subject to requirements for implementing stormwater controls on the results of this research and an update on Ecology’s position regarding bioretention siting.