

Hill Air Force Base Environmental Restoration Clearfield City Council Update

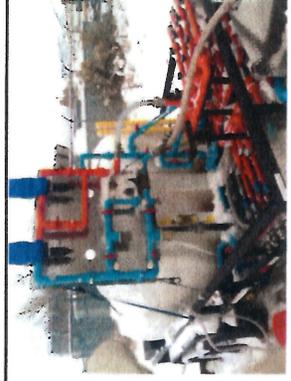
June 14, 2016

Since Last Time (Mar. 25, 2014)

- Proposed Plan issued for public comment
- Record of Decision signed (September 2015)
- Remedy installed. Injection and monitoring wells installed.
- Preliminary results are favorable.

Clearfield City Timeline

Early 2000s	Shallow TCE plume discovered in Clearfield
Mid-2000s	PCE plume and deep TCE plume discovered in Clearfield.
2007	Study to evaluate if groundwater can be treated beneath the surface by injecting chemical oxidant and carbon substrate.
2010	Phytoremediation study (using trees to extract contaminated groundwater)
2014	On-base enhanced reductive dechlorination (ERD) treatability study.
2015	Record of Decision signed.
2015	Remedy installed.
2016	Long-term operations and monitoring.



Clearfield Contamination Background

In a number of communities surrounding Hill AFB, including Clearfield, chemicals historically disposed on base have contaminated areas of groundwater. This is not the drinking water.

Groundwater: Contamination in Clearfield consists of a shallow trichloroethene (TCE) plume discovered in the early 2000s, and a tetrachloroethene (PCE) and a deeper TCE plume discovered in the mid-2000s. Both of these chemicals, known as chlorinated solvents, were used at Hill AFB for vehicle and munitions maintenance from the end of World War II to the 1960s. In most cases, there is no threat of exposure to the chemicals by coming into contact with the groundwater because of the depth to the contamination.

Cleanup: In 2015, the Air Force signed a Record of Decision outlining the cleanup plans for Operable Unit 10, which includes the groundwater contamination in Clearfield.

Earlier studies determined the most effective way to treat the groundwater contamination in Clearfield is to treat it in-place using natural biological processes. To enhance those processes, emulsified vegetable oil is injected directly into the contaminated groundwater providing a useable carbon source to microorganisms in the soil. With the additional carbon in the environment the microorganisms can degrade the contaminants more quickly. This technique was deployed at approximately 30 locations in Clearfield this past summer. Early data returns are promising. As more data come in, more injection sites may be installed to enhance the cleanup process.

The deeper plumes will be allowed to attenuate naturally. To ensure that water is not used, institutional controls have been implemented to prevent anyone from drilling wells or otherwise accessing that area of contaminated groundwater.

<p>Operable Unit 10 Shannon Smith: 801-775-6913</p>	
<p>Location</p>	<p><u>TCE</u>: Approximately from Hill AFB Boundary to 650 West and from 500 North to 750 North. Another plume section is located from approximately 800 North to 870 North and from 100 West to main Street. <u>PCE</u>: Approximately from 800 North in a southwest direction to 200 West (about half a block wide) <i>Depth to groundwater: 3-185 feet</i></p>
<p>Chemicals</p>	<p>Trichloroethene (TCE)* Tetrachloroethene (PCE)* *Degreasers historically used at Hill AFB</p>
<p>Extent</p>	<p>142 acres affected in Clearfield Approximately 300-350 homes in the area <i>Plumes predicted to be stable. Studying site conditions to confirm.</i></p>
<p>Source</p>	<p>An oil/water separator and spills containing degreasers used for vehicle and munitions maintenance near west area of Hill AFB.</p>
<p>Remedies</p>	<p>Enhanced Reductive Dechlorination (ERD) injections using a carbon substrate. Monitored natural attenuation.</p>



Hill AFB Representatives

Shannon Smith, OU-10 Project Manager: 801-775-6913
Barbara Fisher, Public Affairs: 801-775-3652

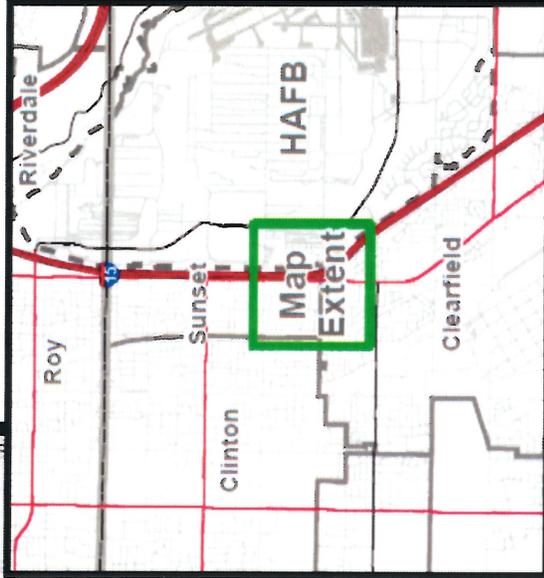
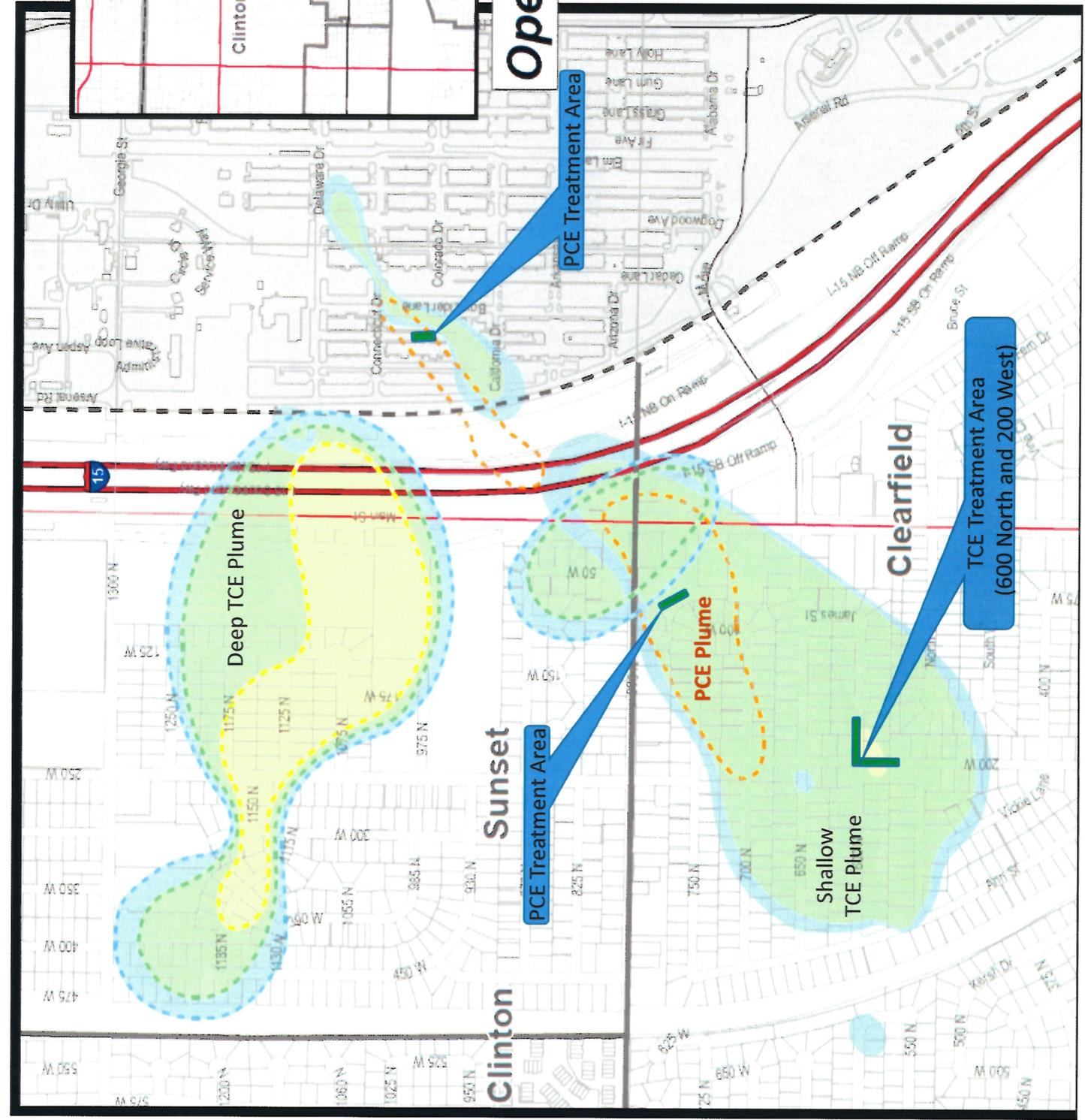
**Hill AFB Restoration Advisory Board
Clearfield Representatives**

Buck Ekstrom, Community Representative: buckekstrom@yahoo.com
Vern Phipps City Representative: vrphipp@hotmail.com

Regulatory Agency Representatives
Sandra Bourgeois, U.S. Environmental Protection Agency:
303-312-6666

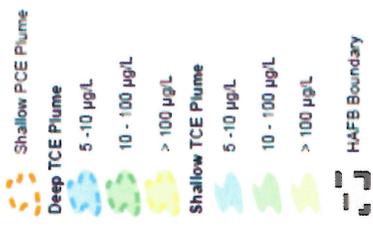
Mo Slam, Utah Department of Environmental Quality:
803-536-4178

Dave Allison, Utah Department of Environmental Quality:
801-536-4479



Operable Unit 10

January 2016



Plumes developed using data collected through 2014

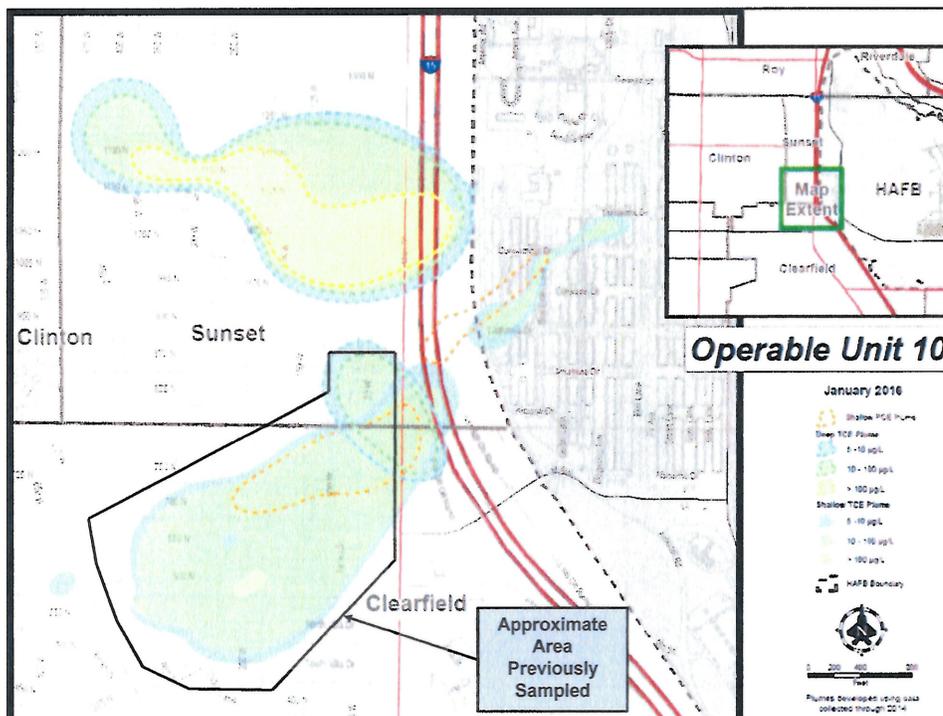


General Information

- ❑ Vapors from chemicals that evaporate easily can move up from the ground and into buildings – *Vapor Intrusion*
- ❑ Most likely to occur in areas where contamination (e.g. groundwater or soil) is shallow
- ❑ Indoor air samples collected to see if there is a problem

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No Vapor Intrusion in Clearfield

- ❑ Sampling results show that vapor intrusion from contaminated groundwater into Clearfield residences is not occurring

- ❑ Based on:
 - ❑ Groundwater samples
 - ❑ Soil gas samples
 - ❑ Indoor air samples

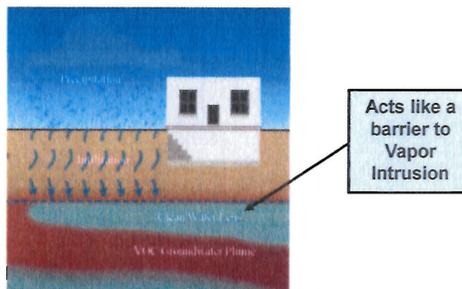
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Why No Vapor Intrusion in Clearfield?

- ❑ Clean water lens overlies plumes
 - ❑ Layer of uncontaminated water at the water table acts as a barrier to vapor intrusion
 - ❑ Based on multiple water table and soil gas samples collected over the plume



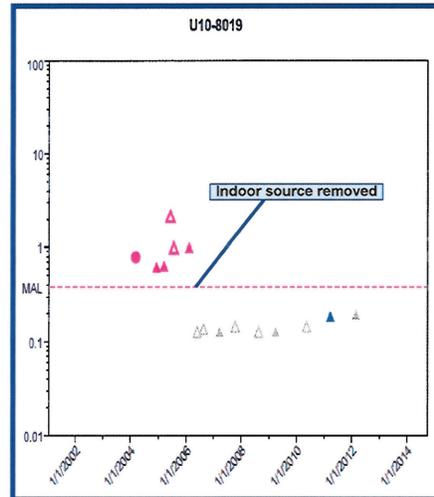
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Indoor Air Sampling Results for Clearfield

- **12 years of indoor air monitoring**
 - 201 of 287 residences sampled (70%)
 - More than 700 samples collected
 - 11 residences had detections above an action level
 - All 11 action level exceedances due to indoor sources
 - No vapor intrusion detected in homes



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What's Next?

- **Hill AFB did not collect indoor air samples from Clearfield residences during the 2015/2016 sampling season**
 - Approved by EPA and Utah DEQ
- **Send letters/fact sheets to residents explaining the change**

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Clearfield homes show no vapor intrusion, will no longer be sampled

Homes in Clearfield were not sampled in the 2015/2016 sampling season as part of the Air Force's Indoor Air Sampling Program. Based on more than 12 years of sampling data and the geologic conditions in the area, Air Force scientists do not believe vapor intrusion is occurring in Clearfield.

Vapor intrusion is the process by which chemical vapors from contaminated groundwater move up through the soil and enter the home through cracks or gaps in the foundation or basement.

During the last 12 years, more than 700 air samples have been collected from 201 of the 287 homes near the area of groundwater contamination in Clearfield. None of the homes were found to have vapor intrusion. Detections above the mitigation action level (MAL), the level at which the Air Force would take action to fix, were attributed to sources of chemical vapors inside the home, such as gun cleaners, solvents or other household products.

Identifying potential inside sources of vapors is a point of emphasis in Hill AFB's Indoor Air Sampling

Program. Some household products contain some of the same chemicals that are found in the groundwater. If these products are in the home, they can be detected in the air sample. If a detection above the MAL is found, sampling teams return to the home with special instruments designed to locate inside sources of the chemicals. If found, the homeowner is asked to remove the sources and another air sample is taken. If chemical vapors are still detected in the follow-up sample, then it's reasonable to assume that vapor intrusion is occurring and a treatment system can be installed to prevent the vapors from entering the home. All detections above the MAL found in Clearfield homes were attributed to inside sources.

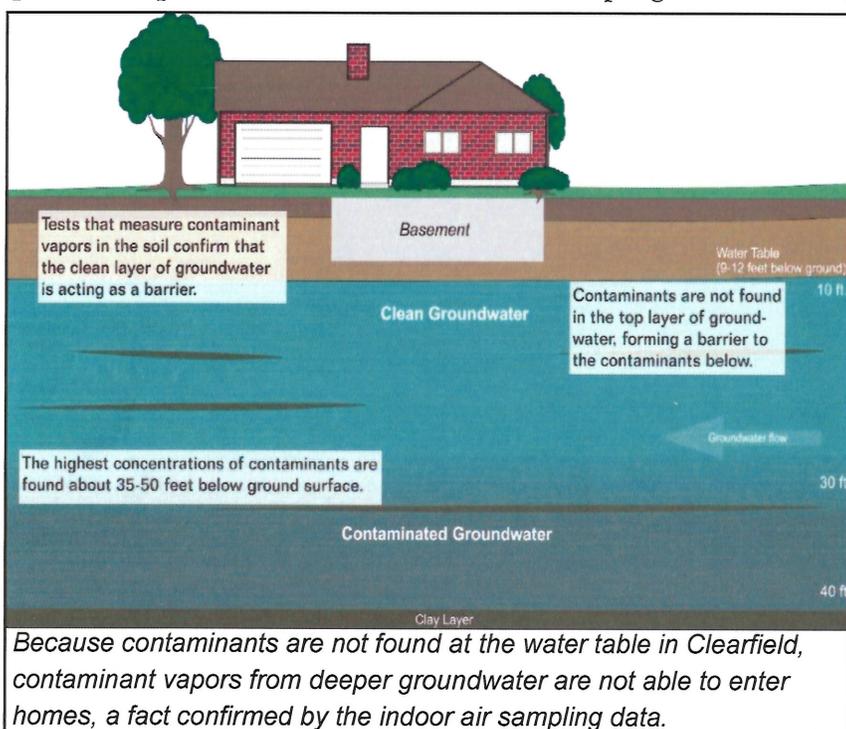
Despite their location above an area of contaminated groundwater, the homes in Clearfield are separated from the contaminants by a layer of clean groundwater, which acts as a barrier to the chemical vapors.

Contaminated groundwater coming from Hill AFB is found at approximately 30 feet below the surface. Ordinarily, as it occurs at other locations around the

base, this would be a source of chemical vapors that could rise up into homes. However, at the top of this layer of contaminated water is a layer of uncontaminated water, resulting from rain and snowmelt. This clean water acts as a barrier to the contaminant vapors, preventing the vapors from moving up into the soil and into the homes.

Soil gas samples—samples taken of the tiny pockets of air trapped between soil particles—confirm this hypothesis.

Based on these lines of evidence, the Air Force proposed the program changes to the Environmental Protection Agency and the Utah Department of Environmental Quality, which agreed that sampling would no longer be necessary in Clearfield.



2016 SWMP UPDATES

Curriculum Outline

Session 1

- Review important dates & useful information
 - SWMP update by July 1 (120 days)
 - New item implementation by Sept 1 (180 days)
 - Fact Sheet and Statement of Basis (FSSOB) – helpful clarifications
- State is now in “enforcement mode”
 - Salt Lake County - \$280,000 in fines and hiring new employees
 - Others pending
 - Everyone now being audited can expect a fine
- Clarifications
 - Only **EMERGENCY** fire fighting is an allowable discharge
 - MS4s need to know about downstream impairments and TMDLs
 - Google Utah DEQ Water Quality Management Assessments
 - Make sure you are using an “ongoing documentation process” – be transparent, where does this come from
 - Track activities - # of inspections, enforcement actions, and type of education activities
 - MS4s are expected to have money to fund permit requirements – “too expensive” is not a justified reason for not doing something
- MCM #1 – Public Education and Outreach
 - Active not passive
 - All audiences, annually – the permit does not explicitly require education on all topics annually, but it is implied
 - General Public/Residents
 - Maintenance of septic systems
 - Effects of outdoor activities (ie. lawn care, pesticides, herbicides and fertilizers)
 - Benefits of on-site infiltration
 - Effects of automotive work and car washing on water quality
 - Proper disposal of swimming pool water
 - Proper management of pet waste
 - Institutions, Industrial & Commercial
 - Effects of outdoor activities (ie. lawn care, pesticides, herbicides and fertilizers)

- Benefits of on-site infiltration
 - Use of salt or other deicing materials – emphasize cover and runoff prevention and contamination to groundwater
 - Proper storage of materials (emphasize pollution prevention)
 - Proper waste management and dumpsters
 - Proper management of parking lots surfaces
 - Engineers, Contractors and Developers
 - SWPPP plan development
 - BMP use for reducing impacts
 - Equipment inspection and timely maintenance
 - Materials storage
 - Waste management and disposal
 - Employees
 - Waste management and disposal
 - Dumpster management
 - Use of salt or other deicing materials – emphasize cover and runoff prevention and contamination to groundwater
 - Benefits of on-site infiltration
 - Proper maintenance of parking lot surfaces
 - Planning and review staff
 - Low Impact Development practices
 - Green infrastructure
 - Communicating specific requirements for post-construction control
 - Communicating specific requirements for BMPs
 - Focused message and audiences – working toward behavior change
 - Encourage active engagement – get involved
 - Specific person and contact information to provide input on SWMP
- IDDE emphasis
 - Mapping priority areas
 - Notify state of industrial businesses not currently permitted or that cause problems
 - Map incidents (physical map or database)
 - Trace illicit discharges to the source
 - Maybe analytical monitoring
 - Annual training of personnel or city staff
 - How to identify a spill

- Proper reporting procedures
- Construction emphasis
 - MS4s responsible for making sure projects have permit coverage
 - Pre con SWPPP review
 - Priority construction sites – map and track
 - Construction hotline
 - Annual training of personnel or city staff
 - Permitting process
 - Plan reviews
 - Construction inspections
 - Enforcement
- Post-Construction emphasis
 - Program applies to private and public projects – including ROAD projects
 - Ordinance to cover:
 - Post construction BMP selection
 - Design requirements
 - Installation
 - O & M standards
 - LID now required
 - Must document exceptions
 - Annual training of personnel or city staff
 - Fundamentals of long-term storm water management
 - Structural methods
 - Non-structural methods
- Pollution Prevention and Good Housekeeping emphasis
 - Inventory of city-owned facilities
 - Identify “high priority”
 - “High Priority” inspections
 - Weekly visual
 - Quarterly comprehensive
 - Quarterly visual discharge observations
 - Collection system priority areas
 - Establish criteria for prioritizing
 - Prioritize

- Not required, but recommend – capital improvements project identification
 - Annual training of personnel or city staff
 - Importance of protecting water quality
 - Permit requirements
 - O & M requirements
 - Inspection procedures
 - How to prevent or minimize impacts while doing their jobs
 - SOPs and city-owned facility SWPPPs
 - Reporting water quality concerns and illicit discharges
- New items in the permit
 - Nutrient removal outreach program – Section 3.2
 - Identifying problem areas
 - Evaluate potential pollutant sources
 - Develop targeted approach – who to contact & what is the message
 - Ag audience can be handled with residential program
 - Focus message on what audience can do to make a difference
 - 90th percentile storm water retainage
 - May require ordinance change
 - LID now required
 - Need LID standard details

Checklist for updating SWMP

- Goal(s) to “beef up” public outreach program
 - Include nutrient reduction topics
 - Include all audiences annually
 - Include multiple topics to all audiences
 - Make program proactive
 - Check with coalition to see what can be done at that level
- Include goal(s) to track:
 - # of IDDE inspections
 - # of enforcement actions

- Public outreach efforts
 - Who did we reach out to
 - What message did we communicate
 - How was it communicated

Do we have four separate priority lists

- Include goal to develop lists you don't have
- Develop written process for prioritizing lists

Goal to require a construction hotline to be posted on SWPPP boards at construction sites

Goal(s) to develop an LID selection process

- Address retainage as part of LID process

Goal(s) to develop LID Standard Details

Update ordinances as needed (only a draft of updated ordinance needs to be submitted with the SWMP update. Final ordinance and new standards have until Sept. 1 to be implemented)

- Make it legal to retain
- Update to require LID including retainage

Consultant Engineering Services

Selection Committee

Scoring Tabulation Sheet

	Adam Lenhard	JJ Allen	Kent Bush	Eric Howes	Spencer Brimley	Dan Schuler	Scott Hodge	Total
Aqua Engineering	34	31	37	32	33	34	32	233
CEC	43	39	50	44	40	40	44	300
Dustin Engineers	25	21	24	27	26	26	26	175
H&A Entellus	40	40	41	37	36	30	37	261
Jones & Assoc.	40	40	46	39	40	37	40	282
Wilson & Company	28	30	32	23	29	26	23	191