## Underground Injection Control (UIC) Wells in WA







## **UIC Program Goal**

The goal of Washington's UIC Program is to protect ground water quality by regulating discharges from UIC wells.



# **UIC Program Laws**

1984, Ecology received authority from EPA to regulate UIC wells

- Federal Safe Drinking Water Act
- WA State Water Pollution Control Act, chapter 90.48
- ► Chapter 173-218 WAC UIC Program
- Chapter 173-200 WAC Groundwater Quality Standards

NPDES Phase I & 2 stormwater municipal permits do not include UIC wells

## What is a UIC well?





- A UIC well is a man made structure used to discharge fluids into the subsurface.
- It has to be deeper than wide at the land surface or a structure that contains perforated pipe, or an improved sinkhole.
- Examples: drywell, infiltration trench with perforated pipe, drainfield, storm chambers and borehole.
- EPA Classification: Class V well

## Exemptions

- Storm drain components designed and intended to move water to surface water
- Infiltration ponds, dispersion systems or infiltration trenches without perforated pipe
- Septic system drainfields receiving only sanitary waste and serves less than 20 people per day or design capacity of 3,500 gpd or less

## How UIC wells are used in WA



- Manage Stormwater from roads, parking areas and building roofs. 45,000 state wide.
- Dispose of sanitary waste
- Enhance remediation at cleanup sites;
- Heat pump/air conditioning return flow wells
- Recharge aquifers
- Dispose of commercial and industrial waste fluids

## Potential contaminants in Stormwater

- Roads and highways oil and grease, polycyclic aromatic hydrocarbons (PAHs), lead, zinc, copper, cadmium, sediments and road salts
- Residential land use road contaminants, herbicides and pesticides, nutrients, bacteria and viruses
- Industrial areas heavy metals, sediment, organic pollutants, PAHs and hydrocarbons

## Examples of Prohibited discharges





- Vehicle maintenance, repair waste fluids
- Vehicle and engine wash water
- Industrial waste fluids not under a discharge permit
- Contaminated sites, when the use of the UIC well would increase mobility of the contaminants
- Stormwater with high-pollutant load and no treatment or in areas where hazardous substances are stored or used

# What do I have to do if I own or manage a UIC well?



Meet the rule requirements (rule authorization):

- All UIC wells must be registered once with Ecology (on tribal land register with EPA Region 10) and
- Meet the groundwater protection requirement (nonendangerment standard). The discharge meets the GWQS at the top of the water table.

#### OR

A permit will be needed to operate a well.

#### Registration and rule requirements for Stormwater UIC wells

- "New " wells registered <u>before</u> use. Stormwater well treatment based on pollutant load/land use and type of unsaturated soils beneath UIC well.
- Existing stormwater wells, built before February 2006, require a well assessment to determine high-threat to groundwater wells. Retrofitting of high-threat wells required.

### UIC well locations in the Lower Yakima Valley GWMA



## UIC wells in the Lower Yakima Valley

- Approximately 75 registered UIC wells
- 59 are used to manage stormwater along roads, parking areas, and to collect roof runoff. Yakima County owns more than half.
  - All stormwater wells < 10 feet in depth. Drywells and infiltration trenches.
  - 12 wells used at commercial and industrial sites(Cargill, Stadelman Fruit)
- 16 used to add remediation products to the ground

#### Spokane County Stormwater Treatment BMP Study, 2003.

- Included 1 site/drywell, street runoff, only 2 storm events
- Nitrite + Nitrate ,inflow average 0.728 mg/l
- TKN inflow average 0.0019-0.022 mg/l

#### WW Phase 1 NPDES communities Stormwater Characterization 2009-2013

Phase 1 NPDES communities, Clark, King, Pierce, Snohomish Counties, City of Tacoma and Seattle, and Port of Seattle and Tacoma (44,800 data records, water and sediment)

- Collected stormwater samples from different land uses over a 3-4 year period
  - Low (1-2 houses/acre), high density (4 or > houses/acre) residential, commercial(includes multi-family residential) and industrial
- Automatic samplers used, flow weighted composite sample collected (once 0.02 rainfall or flow in conduit) across a storm event (80-90% of storm)

#### WW Phase 1 NPDES communities Stormwater Characterization Study 2009-2013, cont.

#### A look at concentrations of all land uses

- Nitrite-Nitrate dissolved 90% percentile of samples were < 0.9 mg/l. 10% were greater then 1 mg/l but only 1 over 10 mg/l (Port area), 58 mg/l.
- Total Kjeidahl Nitrogen (TKN) (organic Nitrogen + ammonia + ammonium) – 90 % percentile < 3 mg/l. 3 samples over 10 mg/l, max was 25 mg/l, all commercial sites.
- ▶ The dry season had higher TKN concentrations than the wet season.
- Low and high-density residential Nitrate-nitrate concentrations were higher then commercial land use.
- Ammonia 90% (90<sup>th</sup> percentile) of results, < than 0.5 mg/l all land uses. Ammonia detected in all samples.

### Summary

- UIC wells are shallow structures uses to discharge fluids (passively) into the subsurface. Majority are used for stormwater management along roads, parking lots and to collect roof runoff.
- UIC program registration reviews site characteristics to determine if treatment is needed or is prohibitive.
- 75 UIC wells are located in the Lower Yakima Valley.
- According to the WW stormwater study, low concentrations of nitrogen were associated with all land uses but concentrations differ between the different land uses.

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