National Site Assessment Symposium Training Program
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Assessment Strategies for PFAS Case Study for the Blades Groundwater Site

- U.S. EPA, Region 3
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Fumetrol 140 - Specific Gravity:1.025
ORGANIC FLUOROSULFONATE 7% by volume

Objectives:
The aim of the investigation was to identify strategies for EPA and stakeholders to extend best methods and testing for PFAS releases and to establish a plan with strategies and best management practices for data collection.

Focus areas for this Site Inspection: regulation, mapping and geospatial data, including fate, transport and toxicology,

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Site Assessment Factors

- Regulation:
  - U.S. Environmental Protection Agency (U.S. EPA) drinking water lifetime health advisory for the sum of PFOA and PFOS of 70 ng/L.
  - The State of Delaware has designated PFOA and PFOS hazardous substances as of July, 2018.
- Mapping/Geospatial:
  - Extent of potential affects. Maximum concentrations and magnitude of affect.
  - Lithological layers - higher permeability units, confining units.
  - Affected wells, affected rivers and wetlands i.e. (Targets and Receptors)
- Fate:
  - PFASs is highly water soluble with weak soil sorption and exhibit recalcitrance to natural degradation, leading to the potential for large but narrow groundwater plumes.
- Transport:
  - Transport in sandy lithological layers and higher permeability units and confining units.
  - PFAS compounds flow readily with a density close to water.
  - High solubility.

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-Focus areas: mapping/geospacial, including fate, transport, toxicology, and regulation
-In particular, there is still considerable uncertainty regarding human health impacts of PFASs.
-Frameworks sequentially evaluating exposure, persistence, and treatability can prioritize PFASs for evaluation of potential human health impacts.
-This site-wide case study illustrates how geospatial and standard investigatory methods can help address knowledge gaps regarding potential sources of PFASs in this particular drinking water aquifer and evaluate risk of exposure to human health.

Toxicology
Groundwater Pathways – GW, SW, SED, Soil, ATM
Receptors Impacted
Types of PFAS onsite

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Site Assessment Specifics

Where is the PFAS contamination coming from?

- EPA identified the use of PFAS containing *Fumetrol* 140 and chromium tetrafluoroborate use at two electroplating facilities.
- EPA and Delaware's DHSS identified PFAS in three public wells near two adjacent industrial plating facilities.
- EPA's identified PFAS contamination in nine of 50 residential wells.
- Further assessment is continuing to determine the source(s) of this contamination. The contamination from both facilities may be comingled containing PFAS, chromium, and cyanide.
- Both facilities have used multiple types of plating processes.
- Chromium and cyanide have been identified in several residential wells.

-In particular, there is still considerable uncertainty regarding human health impacts of PFASs.
-This site-wide case study illustrates how geospatial and standard investigatory methods can help address knowledge gaps regarding potential sources of PFASs in this particular drinking water aquifer and evaluate risk of exposure to human health.

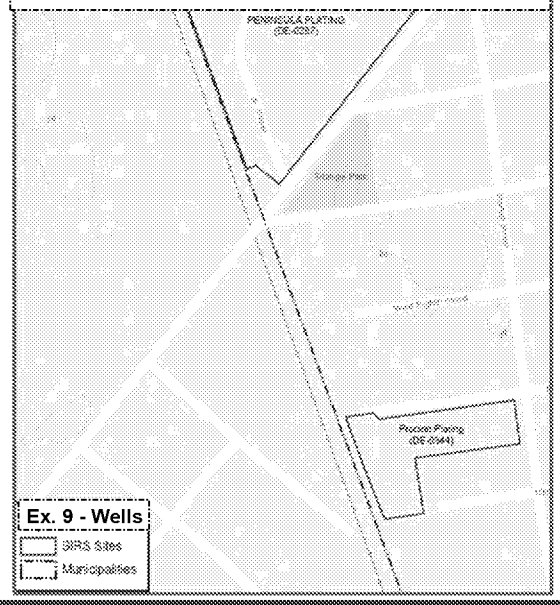
Site Location and Targets

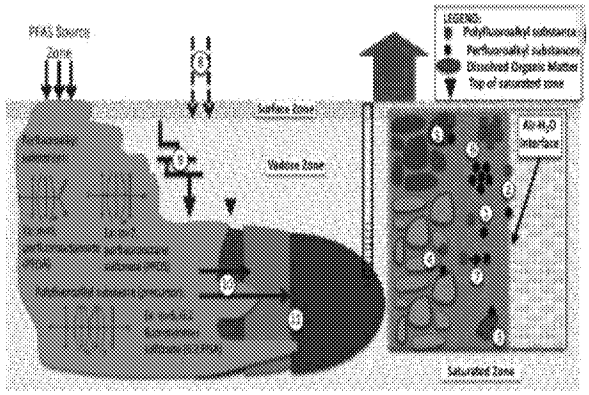
- Sample Results
  - 3 wells had results exceeding the combined PFOA/PFOS - HAL.
    - Drinking Water - 193.0, 117.5, and 96.2 (ppt)
  - Nine residential wells had concentrations above the HAL. Delaware installed treatment for the wells.
  - One residential well had a concentration of 364 ppt.
- EPA still conducting assessment of the groundwater plume.
  - Known contamination of the groundwater and soil.
  - Threats to the surface water (human food chain, wetlands).
  - Inadequate controls and no remediation of groundwater to date.
  - Abundant potential source soils at the two facilities.

Ex. 5 Deliberative Process (DP)

Site Location and Targets

Ex. 9 - Wells





Ex. 5 Deliberative Process (DP)

Target - Residential Wells

Ex. 9 Wells

Coordinated with EPA's Removal Program to quickly collect residential well samples.

Site Assessment Responses to Contamination

Response to the PFAS contamination

- The Town of Blades installed a treatment system on the three wells.
- Further assessment continues:
  - EPA is conducting a Site Inspection of the greater groundwater area.
  - Well Drilling – 18 new well clusters (shallow, intermediate, deep)
  - Collected 9 comingled surface water and sediment samples from the Morgan Branch stream and Nanticoke wetland area adjacent to the town.
  - Collected groundwater samples from all 18 existing well pairs on the Procino facility.
  - Review residential data from the 50 wells. (2 inch wells are installed 40-105 feet)
  - Review the sewer system to determine if contamination was transported via the system to discharge areas.
  - Research additional facilities for commercial of industrial use of PFAS.

Ex. 5 Deliberative Process (DP)

Site Assessment Strategy

Response to the PFAS contamination

- Resample the Town of Blades wells to confirm the results and collect concurrent data with the ongoing SI.
- 18 new SI wells – Drilled using an auger rig and split spoons
  - Shallow wells are to identify or to eliminate source areas. (≈16 feet)
  - Intermediate wells are to determine if the two facilities are comingled and to determine hydrological flow direction. (≈45 feet)
  - Deep wells are to determine if the facilities are comingled and the regional flow/pumping direction and cone of influence of the public wells. (≈96-105 feet)
  - Sample 18 existing wells on the Procino Plating facility to determine the extent of a release.
- Collect 9 comingled surface water and sediment samples from a stream and wetland adjacent to the site to determine regional impacts.
- Review the method of transporting electroplating fluids through onsite water handling systems and onto the sewer system.
- Review site documents which indicated a dry well existed on the Procino Plating facility.

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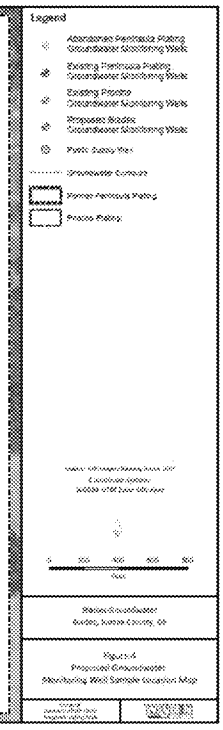
Site Assessment Strategy

Ex. 9 Wells

Ex. 5 Deliberative Process (DP)

Site Assessment Strategy

Ex. 9 Wells



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Talk about map...

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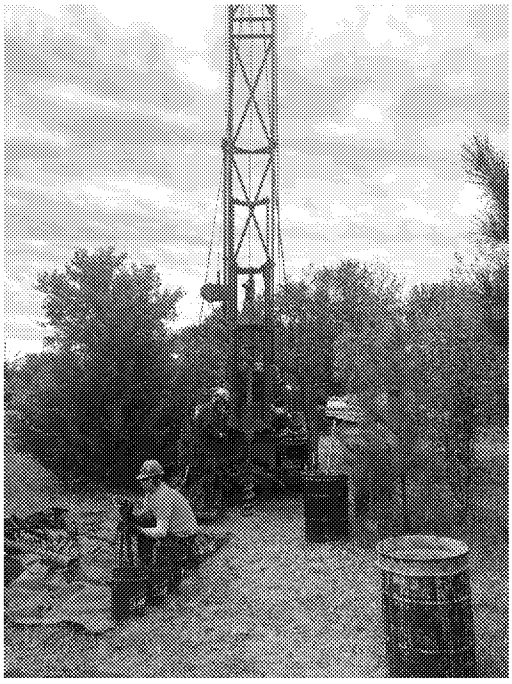
Site Assessment Photographs



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Ex. 5 Deliberative Process (DP)

Site Assessment Photographs

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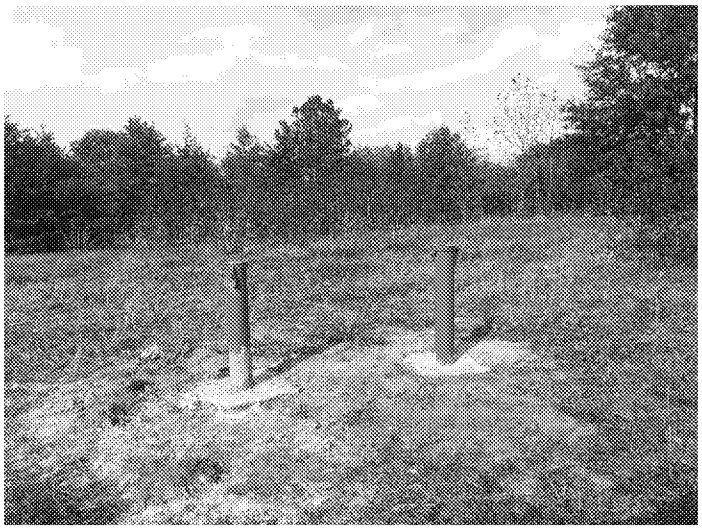
Site Assessment Photographs

Any Questions?



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Completed groundwater monitoring wells for the SI investigation, down gradient wells over 3000 feet from the sources.

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