

SAFEGUARDING FLORIDA'S DRINKING WATER

Assessing and Mapping Well Contamination

Division of Environmental Health



The Petroleum Well Surveillance Program

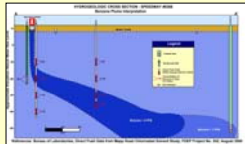
In 1986, the Florida Legislature created the State Underground Petroleum Environmental Response Act (SUPER Act) Program in response to groundwater contamination resulting from leaking underground petroleum storage tanks. As a result, the Florida Department of Health (DOH) was given the public health responsibility of identifying drinking water wells around contaminated petroleum facilities and sampling for dissolved volatile organic compounds (VOCs). Drinking water that contains VOCs can increase the risk for a variety of health problems, including cancer.



DOH uses Real-time Differential Global Positioning System (RDGPS) technology to collect the location information of contaminated petroleum facilities and nearby wells. The work is conducted by field staff at the 67 County Health Departments (CHD).

Using RDGPS receivers attached to handheld computers, the CHDs locate wells within a quarter mile of contaminated storage facilities. Each well is tagged with a Florida Unique Well Identification (FLUWID) number and sampled for VOCs, which could be present in petroleum contaminated groundwater.

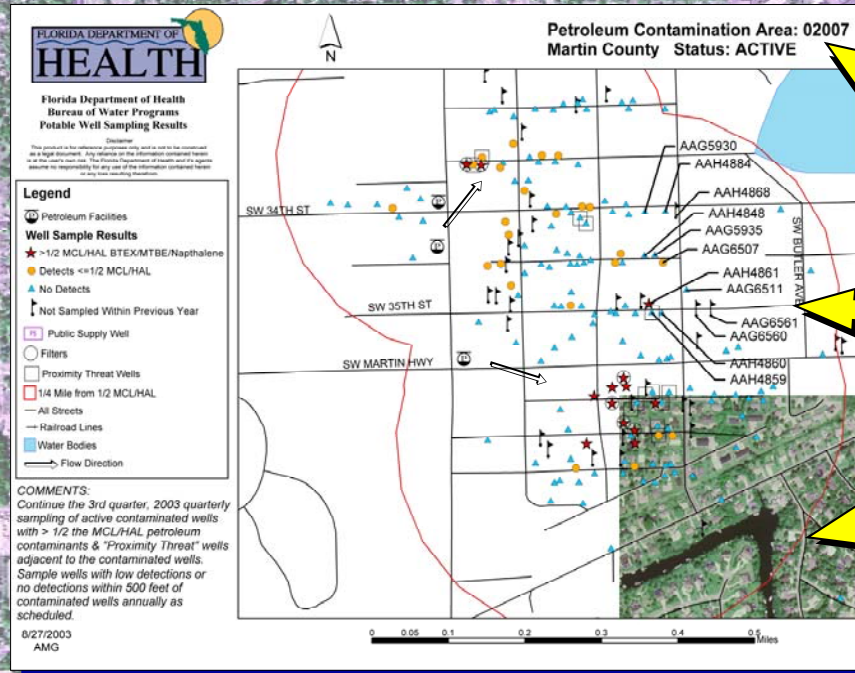
Contamination area analysis begins once the RDGPS information is linked to the corresponding sample results. Wells are symbolized in ArcMap based on the latest level of detected chemicals. When the contamination in a well rises above one-half of either the Maximum Contaminant Level (MCL) or Health Advisory Level (HAL), a new contamination area is identified.



New contamination areas are mapped with contaminant levels, buffer distances, and groundwater flow direction. Customized ArcMap tools were created to facilitate prompt creation and distribution of these maps.

Contamination areas are re-mapped quarterly to reflect updated GPS data and results from recent well sampling.

The completed map is a vital tool for program analysts in determining sampling priorities for wells at risk of contamination.



Custom Tools



CONTAMINATION AREA
Prompts user to enter their initials and a contamination area number. The view then zooms to the contamination area. Information such as status, county, and comments are queried from the backend Access database and placed on the map layout view.

PRINT
Applies the correct printing format to the map document and 'prints' the map as a tif file to our electronic archiving system.

LABEL
Allows the user to select an area of the map, all active layer points within the selection are labeled. The label text is converted into annotated text, allowing the user to freely move the text while maintaining a constant position of origination for the label line.

EXPORT
Sets the image properties and exports the map in layout view as a jpg image. The file name is constructed based on county number and contamination area. The resulting file is stored in a network folder that is specific to the contamination area.

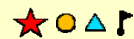
AERIAL PHOTOS
Initially, the map is checked to determine if the necessary reference layers are available. If not, they are added to the current project. The user is then asked to select which series of photos to use as the source. An aerial photo is displayed for each location the user clicks while this tool is active. The added photo layers are moved to the bottom of the layer contents list.

Legend Items



Petroleum Facilities

Locations of potential sources of petroleum contamination, such as underground storage tanks or spill areas. Sampling can be initiated around these locations based on a request from DEP or as part of a monitoring schedule established by the CHD.



Well Sample Results

Potable well locations. The symbol of each well indicates the level of petroleum contamination detected in the well's most recent sample. Wells with levels greater than half of the MCL or HAL are shown as a red star, sampled quarterly and are used to define contamination areas.



Proximity Threat

Represents a potable well that is sampled quarterly based on its location near a contaminated well. Program analysts give a well this designation based on reviews of the area map and interpretation of groundwater contamination movement.



1/4 Mile Buffer

An area extending out one quarter mile from wells with petroleum contamination detected at greater than half the MCL or HAL. The areas defined by these buffers represent the areas of most critical concern. All wells within this buffer area are, at a minimum, sampled annually.