Island County / WRIA 6 Watershed Planning Process

DATA COLLECTION AND MANAGEMENT Topic Paper

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Data Collection and Management

Issues

Comprehensive data collection and management (DCM) efforts are the basis for better management of Island County's groundwater resources. Without ample high quality data, groundwater protection efforts may fall short, allowing degradation of groundwater resources. Conversely, without good data management, efforts may be too restrictive, applying unnecessary burdens on applicants or projects based on faulty risk evaluation.

Introduction and Background

The 1991 Island County Groundwater Management Plan (GWMP) contains several option papers aimed at helping the county better manage and protect its precious groundwater resources. Option Paper #5 is titled Data Collection and Management Program (DCMP). This 23-page paper provides significant detail. It identifies six categories where DCM efforts should be focused. These categories are:

- Well Inventory
- Ground Water / Lake / Wetland Level Monitoring
- Ground Water Usage Monitoring
- Water Quality Monitoring
- Weather Data Collection
- Runoff Data Collection

Data are currently being collected and managed for each of the categories listed above. The purpose of this paper is to explore the current DCM efforts, and to evaluate options for expanding and refining these efforts.

Issue Discussion

Well Inventory

The Island County Health Department (ICHD) has gathered information pertaining to groundwater wells from the following sources:

- Washington Department of Ecology (DOE)
- Washington Department of Health (DOH)
- United States Geological Survey (USGS)
- Washington Dept. of Water Resources - Water Supply Bulletin No. 25
- Individual Well Owners

Data from these logs has been entered into a database that allows for easy retrieval and analysis. In addition, well locations have been refined for the majority of the wells in the database by determining the parcel associated with the well, or by utilizing GPS coordinates. Unified Soil

Classification Codes (USCS) are determined for each stratigraphic unit described in the logs and entered into the database. Land surface altitudes are estimated from digital elevation models (DEM) or from GPS measurements. Several advanced tools such as graphical geochemical analysis and mapping and stratigraphic analysis have been incorporated into the database system. Data from all known pre-existing wells have been entered into this system and entry for new wells is ongoing. Pre-existing wells that do not have records in any of the sources listed above are occasionally located whenever permitting requirements trigger a Water Availability Verification (WAV) and data pertaining to these wells is entered as it is obtained.

Ground Water / Lake / Wetland Level Monitoring

The Island County Health Department has a groundwater-monitoring network that currently utilizes approximately 44 wells throughout the county. Water quality, water level and water use data are collected during monitoring of these wells. The long-term plan for this network is to expand the number of wells monitored to around 100. Prior to HB#2514 / Watershed Planning, efforts to expand the network were targeted to follow area-specific analysis conducted by the Health Department. Island County's 2514 Phase II assessment provides an alternative method for selecting additional wells for inclusion in the network. Wells could be selected for addition to the network from those utilized in the Phase II assessment if funding is available to support the increased analytical costs associated with the planned increase.

Collection of data on depth to water from individual or public water system wells is complicated by the fact that the water level in the wells may not be static (water levels stabilized) when the sampler arrives at the well. Options for getting good static levels include:

- Waiting at the well for the level to stabilize (this can take hours)
- Returning to the well at a later time in hopes of finding it stabilized
- Turning the well off and returning at a later time (if the water system has sufficient storage or other sources)
- Utilizing dedicated water level monitoring wells that are not pumped except during sampling

Each of the above options has its own benefits and drawbacks. Waiting for a well to stabilize may not be appropriate if the well takes hours to achieve stabilization. Returning to the well may cost significant field time and may not obtain the desired result. The option of turning the well off and returning later is available in only a small fraction of systems and increases the amount of time required to obtain a water level. Dedicated monitoring wells provide excellent water level data, but are expensive to install. Currently we utilize the first and third option, but due to time constraints we often are unable to collect a true static level and instead collect a slowly recovering but not fully static level.

The Island County Public Works (ICPW) has obtained grant funding to do some monitoring of stream levels / flows around the county. No lake or wetland level monitoring is currently being conducted. Because grant funding is not long-term, ICPW does not have plans to conduct ongoing long-term monitoring, however if a funding source was available, such monitoring would definitely be useful in order to assess the effectiveness of implemented recommendations and regulations.

Ground Water Usage Monitoring

Although water meters are required for new wells drilled in Island County, no reporting requirements exist unless they are associated with a specific DOE water right. Meter readings from wells on the Island County Groundwater Monitoring Network are being collected and stored in the groundwater database. Voluntary submittals of metering data are also collected and stored in the database when they become available. A significant amount of data has been collected as part of the 2514 Phase II assessment. It will provide for estimations of water usage within the county.

Water Quality Monitoring

There are a variety of on-going groundwater monitoring efforts in Island County. Water samples are collected from the Island County Groundwater Monitoring Network wells in April and August of each year and analyzed for eleven water quality parameters. The list of parameters was selected to detect changes in water quality, with a special emphasis on detection of seawater intrusion and septic system impacts.

The Island County Seawater Intrusion Policy requires chloride and specific conductivity sampling on a semi-annual basis from public water systems that fall in the medium or high-risk category as defined by their proximity to wells with elevated chlorides. The ICHD has been sending out reminder letters to those systems that are not in compliance with these requirements.

DOH has specific water quality sampling requirements for public water systems; in Island County over 700 systems are currently reporting data. The number of parameters sampled for, and the frequency of sampling, are proportional to the size (number of connections) of the systems. Water samples are analyzed by state certified laboratories and results are provided to DOH. ICHD collects water quality data from DOH and incorporates this data into its groundwater database system.

DOE occasionally puts sampling requirements on water right permits. This data is collected and maintained by DOE; ICHD occasionally collects data from DOE and incorporates this data into its groundwater database system.

There have been several surface water quality monitoring projects over the past few years. Most of these are associated with grant funding such as non-point pollution grants. These grants are generally not long-term, however if a funding source was available, such monitoring would definitely be useful in order to assess the effectiveness of implemented recommendations and regulations. Priority sampling sites are: Kristofferson, Chapman, Carp, Glendale and Maxwelton Creeks, Deer Lagoon, Swantown and Freeland Outfalls, Dugulla Pond, and Swantown Lake Wetland.

Weather Data Collection

The primary use for weather data outlined in the GWMP is “to develop a conceptual / theoretical model of the water budget in order to better refine groundwater recharge estimates in the County”. In 1996 Island County entered into a cooperative agreement with the USGS to conduct an

assessment of groundwater recharge in Island County. This assessment utilized a deep percolation model (DPM) to estimate spatial and temporal changes in recharge across the County. Weather stations were established across the county to collect the data needed for this modeling effort. The final report for this work was received in June 2003, and the county will also receive a copy of the model and the underlying datasets for future refinement and application to groundwater modeling efforts.

The Island County Extension Service of Washington State University has a group of volunteers that collect precipitation data from around the County. These data are entered into a database, which has the capability of generating isohyetal (precipitation distribution) contour maps and other statistical analysis. In addition, the Island County Health Department is developing an automated precipitation network utilizing "tipping-bucket" rain gauges and computerized data loggers. The ICHD precipitation sites also record temperature and soil moisture.

Runoff Data Collection

The USGS established six stream gauges within Island County to collect data needed for the DPM / recharge modeling effort. The data from these gauges will be provided to Island County as part of the deliverables for this project. In addition the hardware associated with these gauges will also become the property of Island County.

In 2002 the Island County Health Department established stream gauges in twelve streams across the County. Data collected from these gauges will be used in conjunction with the USGS data to support salmon recovery efforts and also for refinement of water budget estimates in the future.

Findings

Need for Data Collection and Management

Fundamental to any effort to manage and protect water resources is the availability of data pertaining to the status of those resources. Without such data, management efforts can fail to provide adequate protection, allowing for degradation of resources. Alternatively, without good data, management efforts can be overly restrictive, putting undue burden on applicants and projects.

In addition to the obvious benefits to resource managers, good data also provide a sense of security to the users of the resources. If a citizen is concerned about the long-term viability of his or her well, and little information is available regarding the health of the aquifer, then the lack of knowledge can lead to serious concerns that may not be founded in reality but, instead, are due mainly to a lack of information.

Current Efforts

Island County has put significant time and effort into data collection and management and, as a result, Island County has one of the most sophisticated data management systems in the State of Washington. This is not to say there is no room for improvement, and suggestions on where

improvements might be made will be the focus of the remainder of this paper, however, at a minimum, current level of efforts should be continued.

Data From Other Agencies

Several other agencies within the State of Washington are involved in collection of data related to water resources in Island County. The Washington Department of Ecology (DOE) has several ongoing data collection efforts, as well as numerous shorter-term projects that involve collection of significant data. Currently DOE has a limited data system, and as a result obtaining and updating data from DOE is difficult. If DOE had a more efficient data system, maintaining a link to their data would be much easier. Since DOE is the primary water resources agency for the State of Washington, an integrated relational data system is as, if not more important than our local efforts.

The Washington Department of Health (DOH) collects water quality sampling data from public water systems across the state. These data are entered into a database, and data are available from this system. Currently acquiring data is a bit cumbersome, but DOH is in the process of upgrading this system and it is hoped that the process will be streamlined in the future.

Other Options

A significant number of wells in Island County were constructed prior to the initiation of reporting requirements and, as a result, no record of these wells exist. Although information pertaining to these wells is occasionally received through permitting activities, some other mechanism for locating such wells would be useful. This is especially true of poorly constructed large diameter dug wells, since they pose a significant risk for groundwater contamination.

Options

Option #1: Give clear direction to policy makers regarding the necessity of maintaining current Data Collection and Management efforts.

Option #2: Encourage the streamlining of data management and exchange with the State Departments of Ecology and Health. DOE needs to develop a linked data system where well log data is tied (related) to water right, water quality and other information. Issues pertaining to the location of wells needs to be resolved. A method for ensuring that monitoring requirements (provisos) attached to water rights are actually completed, and that the data is brought into the central system, needs development.

Option #3: Water level and chemistry data collected from a domestic well can be highly variable in nature; this variability is primarily due to changes in use (pumping) of the well prior to the arrival of the sampler. For example, a well that has not been pumped for a long period prior to the arrival of the sampler can have a substantially different water quality and water level elevation from the same well if it has been heavily used prior to sampling. Although it is possible to detect recovery of the water level, and, therefore, note that the well was not static at the time of sampling, the sampler

generally has no control over the use of the well prior to sampling. Interpretation of data collected from domestic wells is made much more difficult as a result. Apparent trends in chemistry over time can be artifacts of pre-sampling use rather than actual trends in aquifer water quality.

The current effort aimed at developing new tools for use in analysis of seawater intrusion focuses on static water level elevations. Water level data collected from a well that is not static will not provide the information needed to apply this tool in the future. The most common solution to this problem is to utilize dedicated monitoring wells for data collection points. As long as the monitoring wells are located at some minimum distance from nearby pumping wells, water levels and depth to water measurements from these wells will be truly static and representative of background conditions. Dedicated monitoring wells have the added benefit of not being subject to changes in ownership.

Although monitoring wells are very effective in collecting truly representative data, they do have one major drawback, in that they are expensive. A rough estimate of cost would be approximately $10,000 for a 200-foot well which is roughly the average depth of wells currently on the network.

Recommendations

Recommendation #1: Data Collection and Management efforts should continue to be a priority.

Recommendation #2: Data should be centralized and accessible to those who have need for it.

Recommendation #3: The citizen WRAC members maintain that the County should always have a hydrogeologist on staff. Increased growth may require an increase in staff support and capacity in the future.

Recommendation #4: A program should be developed to obtain dedicated monitoring wells. These wells could be obtained either by drilling of new wells, or by utilizing wells that are no longer utilized in lieu of abandonment.

Recommendation #5: Data management and sharing capabilities at state agencies such as DOH and DOE needs to be enhanced.

Recommendation #6: A stable source of funding needs to be found for ongoing surface water quality and quantity monitoring efforts.