



IWAC

Idaho Washington Aquifer Collaborative

August 13, 2013, 1:30 – 3:30 PM
Liberty Lake Sewer and Water District

Officers: President Mike Galante; VP Ty Wick; Secretary Bryan St. Clair; Treasurer Alan Miller
Representatives Present

	Organization	Representative	Email Address
	Avista	Linda Kiefer	Linda.Kiefer@avistacorp.com
	Bar Circle S Water Company	Rob Turnipseed	avondalecon@frontier.com
√	City of Coeur d'Alene	Jim Markley	jimm@cdaid.org
	City of Post Falls	Mike Neher	mneher@postfallsidaho.org
	City of Spokane RPWRP	Mike Coster	mcoster@spokanecity.org
√	City of Spokane Water Department	Dan Kegley Bill Rickard	dkegley@spokanecity.org brickard@spokanecity.org
√	Coeur d'Alene Tribe of Indians	Laura Laumatia	llaumatia@cdata-nsn.gov
√	Consolidated Irrigation District No. 19	Bob Ashcraft	consolidatedirrigation@comcast.net
√	East Greenacres Irrigation District	Ron Wilson	
	Hayden Area Regional Sewer Board	Ken Windram Shirley Carter	ken@harsb.org
√	Hayden Lake Irrigation District	Alan Miller	alan@haydenirrigation.com
√	Liberty Lake Sewer and Water District	BiJay Adams Jeremy Jenkins	bijay@libertylake.org jjenkins@libertylake.org
√	Model Irrigation District	Jim Lahde	jimlahde@netzero.net
√	Modern Electric Water Company	Bryan St Clair	bstclair@mewco.com
√	North Kootenai Water & Sewer District	Mike Galante	mikeg@nkwsd.com
√	SAJB Program Leader	Tonilee Hanson	sajbinfo@gmail.com
√	Spokane Co. Water Resources	Rob Lindsay	rlindsay@spokanecounty.org
√	Spokane County Water District No. 3	Ty Wick	scwd3@comcast.net
	Spokane Tribe of Indians	Brian Crossley	crossley@spokanetribe.com
	Vera Water and Power	Todd Henry	thentry@verawaterandpower.com
	Guests		
√	City of Spokane Valley	Henry Allen	hallen@spokanevalley.org
√	GSI Water Solutions, Inc.	John Porcello	JPorcello@gsiws.com

√	GSI Water Solutions, Inc.	Walter Burt	WBurt@gsiws.com
√	Idaho Water Engineering	Bob Haynes	bob@idahowaterengineering.com
√	IDEQ	Gary Stevens	gary.stevens@deq.idaho.gov
√	NIC Intern	Rachel Johns	
√	Welch Comer	Necia Maiani	
√	UI Extension – Water Education	Jim Ekins	jekins@uidaho.edu

AGENDA

Welcome and Introductions - President Mike Galante opened the IWAC meeting and welcomed everyone. Representatives and guests introduced themselves.

Agenda Additions - President Galante called for additions or revisions to the Agenda and no changes were requested.

Approval of Meeting Minutes – July 9, 2013, Meeting Minutes were approved as submitted.

Financial Report – Treasurer Alan Miller reported income of \$3,000 in membership dues received to date from North Kootenai Water & Sewer District, Spokane County Water District #3 and Hayden Lake Irrigation District. Expenses to date were \$0.00. An IWAC bank account has been opened.

Old Business

Membership Recruitment

Membership invitations were sent out to SAJB members and Idaho water purveyors. IWAC welcomes participation by all interested parties and membership will continue to be an option for water and waste water purveyors.

The membership invitation letter did not specify the length of time that the membership dues covered. President Galante opened the length of membership up for discussion. It was determined by consensus that membership dues will be for one calendar year, starting January 1st of each year. Invoices will be sent out to members and due by January 31st. Dues will be prorated for districts who paid mid-year and became members during IWAC’s start-up phase. The IWAC membership invitation letter will be revised to include the duration and due dates for membership fees.

New Business

Guest Speaker: John Porcello, RG, LHG, Senior Groundwater Hydrologist, GSI Water Solutions, Inc., 55 SW Yamhill, Suite 300, Portland, OR, 97204. John Porcello’s power point presentation can be found at www.spokaneaquifer.org. John discussed the 2012 SVRPA Groundwater Flow Model expansion and update which was undertaken to:

- Support wellhead protection planning
- Provide a high resolution, up-to date tool for well-field-scale analysis
- Inform ground water resource management

The following notes include text from the power point and some of John's comments.

Slide 2: Various Models have been developed over time. The City of Spokane /SAJB model addresses issues from the USGS BiState Model by expanding some of the boundaries, increasing the resolution and layers. This updated model is flexible for a variety of uses.

Slides 3-7: John reviewed the history of SVRPA Groundwater Modeling:

- 1981: USGS
 - First model (one layer, very simple)
 - Groundwater levels 100+ feet too low in Hillyard Trough; there was some difficulty simulating groundwater levels.
 - Reflected lack of bedrock data (Five Mile Prairie, Trinity Trough, and Western Arm vs. Hillyard Trough). Bedrock data was unavailable.
- 1994-2000: City of Spokane, SAJB, CH2M Hill
 - New, 3-layer model solved a lot of problems by using a flexible mesh
 - Only modeled Washington
 - Underwent a large data collection program with gaging along the river to collect stream-flow data.
 - Calibrated over two seasons: Fall 1994 and Spring 1995
 - Model was used to delineate wellhead protection areas
- 2000: EWU Bi-State Model
 - MODFLOW: Rectangular cells were used, rather than flexible mesh
 - Scale was coarse (1/2 mile cells due to computing limitations)
 - Used for basin and sub-regional scale analysis
 - Not as adaptable to analysis in well fields and along rivers
- Mid 2000s: USGS Bi-State Model
 - More detailed resolution (MODFLOW, 1/4 mile cells)
 - Focused on basin and sub-regional scale
 - Detailed transient calibration (monthly, 1990-2005)
 - Only one layer (except 3 layers in Hillyard Trough)
 - Appear to not use correct aquifer thickness.
- 2012: City of Spokane/SAJB Model Expansion
 - Objective: Combine available information for Idaho with the information present for Washington, to create an aquifer-wide model.
 - Study the effects of storm water research facilities on source water protection areas (SWPAs).
 - Verify the method for delineating SWAPAs.
- 2013: Finalize Storm Water Protection Areas (City of Spokane and SAJB)
- Slides 6 and 7 are graphics showing proposed special wellhead protection areas

Slide 8: Objectives for the Expansion Process and for Use of the Updated Model

- Support Wellhead protection planning
 - Avoid truncation of capture zones at state line
- Provide high-resolution, up-to-date tool for:
 - Well-field scale analyses

- Groundwater resource management at other scales: Historically, models have been used independently for specific areas. This new model is an attempt to combine all the previous models and include the entire SVRP aquifer.

Slides 9-15: John displayed graphic examples of flexible mesh increased resolution at:

- Consolidated Irrigation District monitoring well
- Salfese Flats/Shelly Lake Recharge Basin
- Chester Creek Recharge Basins
- Pasadena Park Irrigation District, Orchard Avenue Irrigation District, Inland Empire Paper Company and the City of Millwood
- Hillyard Trough

John demonstrated how the three depth layers of the new model could be analyzed to inform the discussion of Spokane River in-stream flow, relationship to wells in proximity of the river and pumping rates.

Slide 16-20: Examples: Well Electric and Parkwater

- Colors represent water levels
- This simulation can help show how groundwater is moving (flow arrows). It also gives indications of how permeable the aquifer can be.
- Shows the profile and shape of water table
- Graphing particle movement: Cross-section captures flow lines, and simulates gallons per minute pumped in relationship to varying depths.

Slides 21-23: Interactions between the Spokane River and SVRP Aquifer

- Simulated Aquifer wide water budget using average annual conditions
- Groundwater elevations and gaining reaches of the Spokane river
- Average annualized model shows how the river's net loss and gain on an average annual basis).
 - John expressed uncertainty about the amount of seepage attributed to Lake Coeur d'Alene and the physics of how such seepage could be happening
- This model used data from previous studies to help understand how each of these reaches behaves and the relative magnitudes of each exchange.
 - Data was calibrated during the fall of 1994 and spring of 1995.
 - Identified gaining reaches
 - Sullivan Road to Plante's Ferry
 - Upriver Dam Tailway to Greene St. Bridge
 - Green St. Bridge to Monroe St. Bridge
 - Western Arm of the Aquifer (below Monroe Street Bridge)

Slides 24-32: Other Aspects of the City of Spokane/ SAJB Model:

1. Grid includes some adjoining areas with alluvial deposits that might be of interest in the future: Mouth of Hangman Creek; Spirit and Hoodoo valleys in Idaho
2. Uses three layers to simulate groundwater flow
 - Most wells in upper 100 feet of aquifer (Layer 1)
 - Few wells in Layer 2 (depths of 100-200 ft. below water table)
 - No wells in Layer 3 (more than 200 ft. below water table)

- o Bi-State model has just one layer, except north of city
- 3. Updated interpretation of aquifer thickness
 - o Incorporates Ecology information near Greene Street Bridge
 - o Reconciles discrepancies in USGS-published mapping (**i.e., Groundwater Elevation minus Bedrock Elevation ≠ Aquifer Thickness**)
- 4. Inflows from tributary drainages and lakes
 - o 37 areas in Washington and 38 areas in Idaho
 - o Same representation as in USGS Bi-State model
- 5. Multiple stage profiles for the Spokane River
 - o Summer conditions (low-stage / low-flow)
 - o Spring conditions (high-stage / high-flow)
 - o Annual average conditions
- 6. Updated well list and pumping rates
 - o Annual rates as compiled by the City of Spokane
- 7. Areal recharge from bi-state model
- 8. Pumping and areal recharge are now separated.
 - o Sometimes water leaving aquifer is partially returned to the aquifer. There is a part subtracted from what comes back down. This works on a regional model, but not on a well-specific model.
 - o Lumped together into single term in bi-state model.
 - Bi-State model pumping = net withdrawal
 - (1) Actual pumping minus
 - (2) Septic system infiltration minus
 - (3) 40% of outdoor-applied water in urban areas minus
 - (4) 40% of outdoor-applied water on irrigated fields
 - This makes it difficult to change pumping in Bi-State model: requires decisions on whether (and how) to change recharge
 - These two terms are now separate in the City/SAJB model
 - o All input data are stored in the model software. This facilitates visual display; allows mathematical analysis of input data, facilitates quality control; includes labels of key features; and facilitates future adjustments to the model grid (i.e., data values at existing nodes will not get lost)

Slide 33: Comparison: Bi-State Model and City of Spokane/SAJB Model

Model Aspect	Bi-State Model	City/SAJB Model
Multi-layered in N. Hillyard Trough	Yes	Yes
Multi-layered elsewhere	No	Yes
Aquifer thickness coverage reproducible	No	Yes
Wells penetrate only upper portion of aquifer	No	Yes
Pumping can be changed separately from recharge	No	Yes
Wellfield-scale analysis (fine detail in the grid)	No	Yes
Higher spatial resolution along river than elsewhere	No	Yes (in places)
Tributaries, lakes, and irrigation recharge	Yes	Yes
Calibration (water levels, exchanges with river)		
- Summer	Yes	Yes (Sept. 1994)
- Winter	Yes	Yes (April 1995)
- Year Round	Yes	No
	(WY 1990-2005)	

Slides 35 - 48: Other Work and Findings:

- Review Special Wellhead Protection Area (SWPA) delineation methodology
 - Can the 2010 special wellhead protection areas be replicated?
- Regional storm water recharge facilities
 - Study effects of large scale recharge on the 2010 SWPAs

Questions/Comments

- In the USGS model, is there a good return number (from urban or agricultural)?
 - For urban, the number is how much water reaches the water table; it is a high number. For agricultural, the number is fairly high as well, considering uptake by plant absorption, etc. Presently, it is at 40%.
- Are there any plans to update the 2000 USGS model?
 - Right now there is not a driving reason to update it.
- Regarding water quality, can the model simulate reclaimed water or stormwater that is applied to land beyond the root zone and returned to the aquifer/river system?
 - The model simulates recharge. However, it does not calculate the transport of nutrients or their impact on water quality. Other simulation features could be built to nutrients/toxics.
- Regarding the presentation of Saltese Flats and Shelly Lake: Is that happening now, in the past, or is it futuristic?
 - Unsure of whether or not that is a plan for future condition or if that is today.
- By updating information in Idaho, parts of the simulation can be turned on or off. In the creation of the new model, a lot of work was done on the Washington side regarding aquifer boundaries. Aquifer boundaries on the Idaho side are based purely on USGS model.
 - The Idaho Department of Water Resources drilled two wells (located just north of the interstate, east and south of golf course, and near the centennial trail.) Those wells have been collecting data for 2-3 years. The water information collected by these wells should be available from IDWR. Another monitoring well, located at a middle school just north of Kathleen, is being drilled but is not yet operational. The purpose of these wells is to monitoring water quality and support Aquifer protection.

July 24, 2013 CAMP Update

Three grant proposals were reviewed at the CAMP meeting. The Ralston/Johnson proposal, "Evaluation of Alternative Groundwater Pumping Schemes as an Approach to Mitigating Problems of Critical Low Flow in the Spokane River at Spokane, Washington" was recommended for \$70,000 of funding. The proposal will submitted for final approval at the November meeting in Boise.

September 10, 2013 - Agenda Planning

Welcome & Introductions
Agenda Additions or Revisions
Approval of Meeting Minutes
Financial Report

Old Business

On-going Membership Recruitment

New Business

- Guest Speaker – Allyson Beall Model Presentation
 - Using MODFLOW and other examples
 - Act as an information exchange for various groups doing similar work in the basin.

Updates Around the Table

Spokane County will host the WRIA 55/57 and 56 Watershed Implementation Team (WIT) Meeting Wednesday 8/14/13 from 10-12 at the Spokane County Water Resources Center. 1004 N. Freya, Spokane, WA

Mike Hermanson will be invited to the October 8th IWAC meeting to present the Washington Water Demand model.

Meeting adjourned at 3:30 p.m.