Application of Science to Water Right Regulation and Permitting

House Agriculture and Natural Resources Committee

February 6, 2013

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Field Services Administrator
Oregon Water Resources Department

Water Management

- Manage water statewide
- Conjunctive management state
- Protection of senior users

Protection of Senior Users

Science is applied to new applications for water and to manage existing uses

- groundwater declines
- well-to-well interference complaints
- calls by senior surface water rights

Protection of Senior Users

Example:

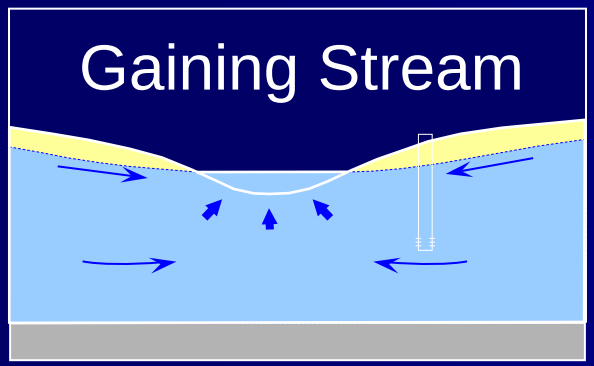
Call by a senior surface water right for regulation of a junior groundwater user

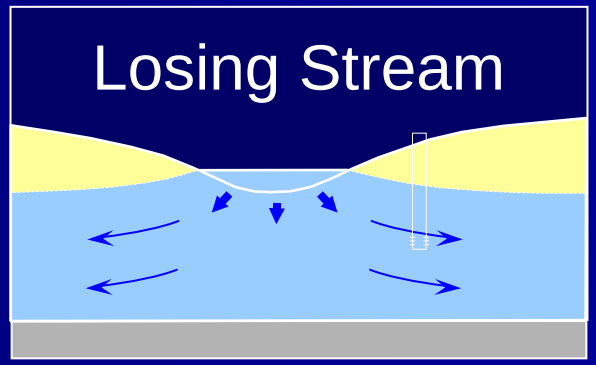
Protection of Senior Users

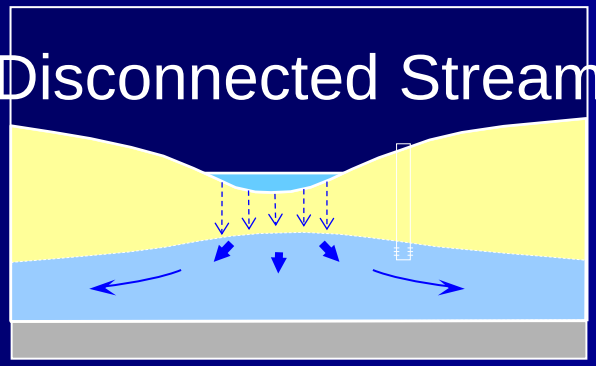
First step: Validate the call

Protection of Senior Users

Next: Evaluate the hydrogeologic conditions that would support or refute substantial interference with surface water





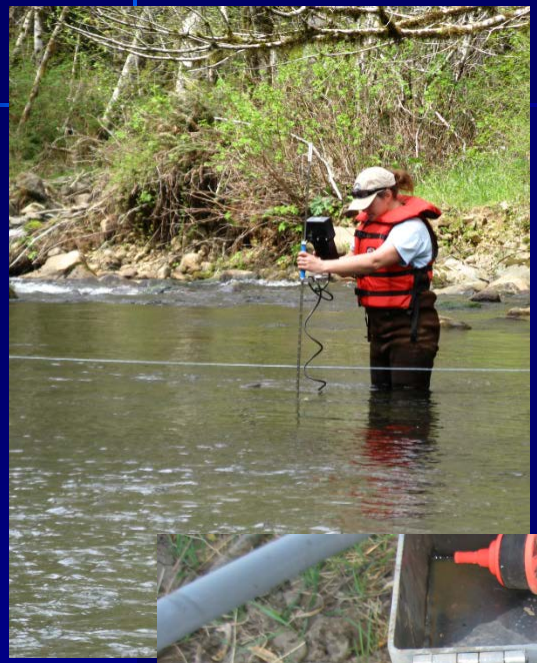


Protection of Senior Users

What information do we have on hydraulic connection?

- Seepage run data
- Piezometers
- Temperature logging
- Groundwater level and stream gage data

Surface Water Gain / Loss Studies)

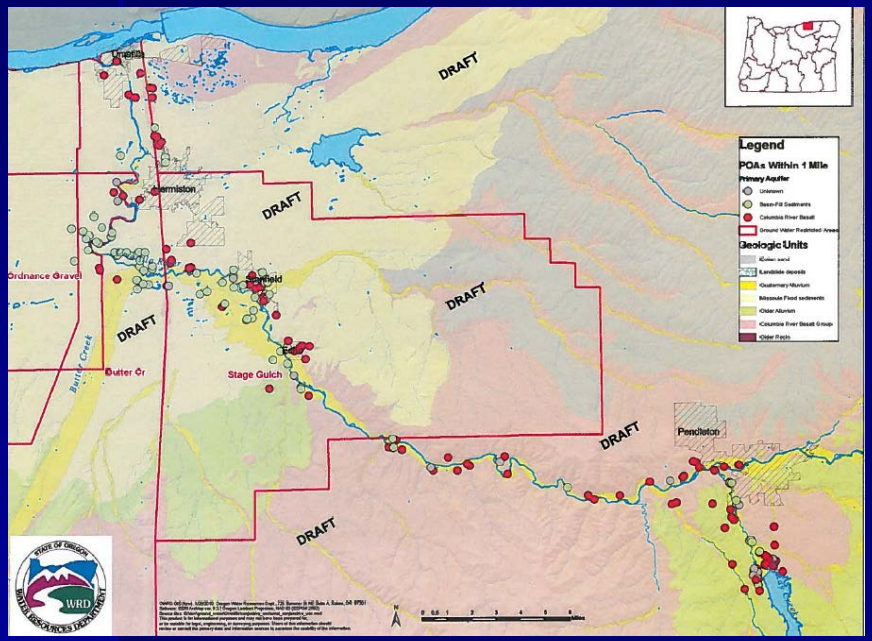


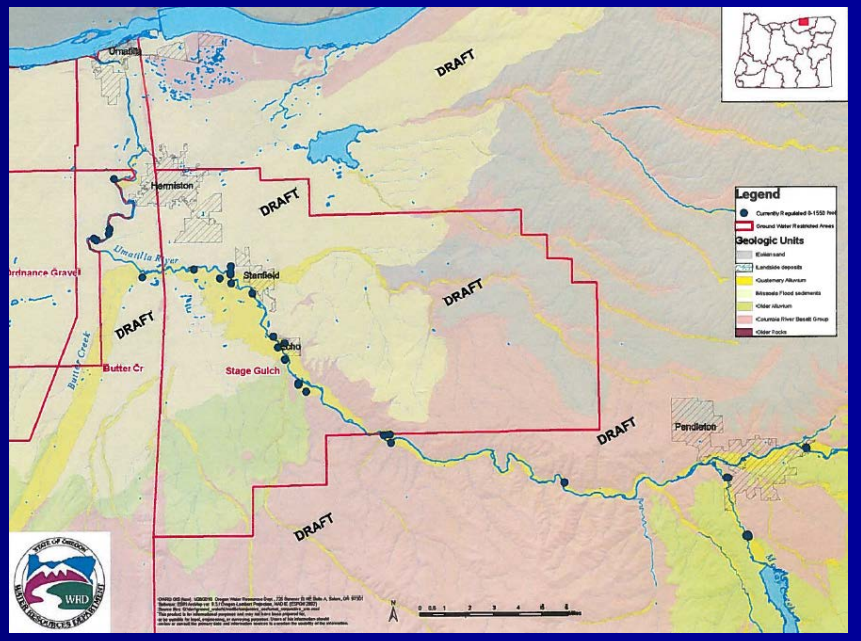
Provides:

- Distribution of GW contribution to streams
- Distribution of stream losses to GW
- Magnitude of gains and losses

Protection of Senior Users

Next: evaluate the junior up-gradient users

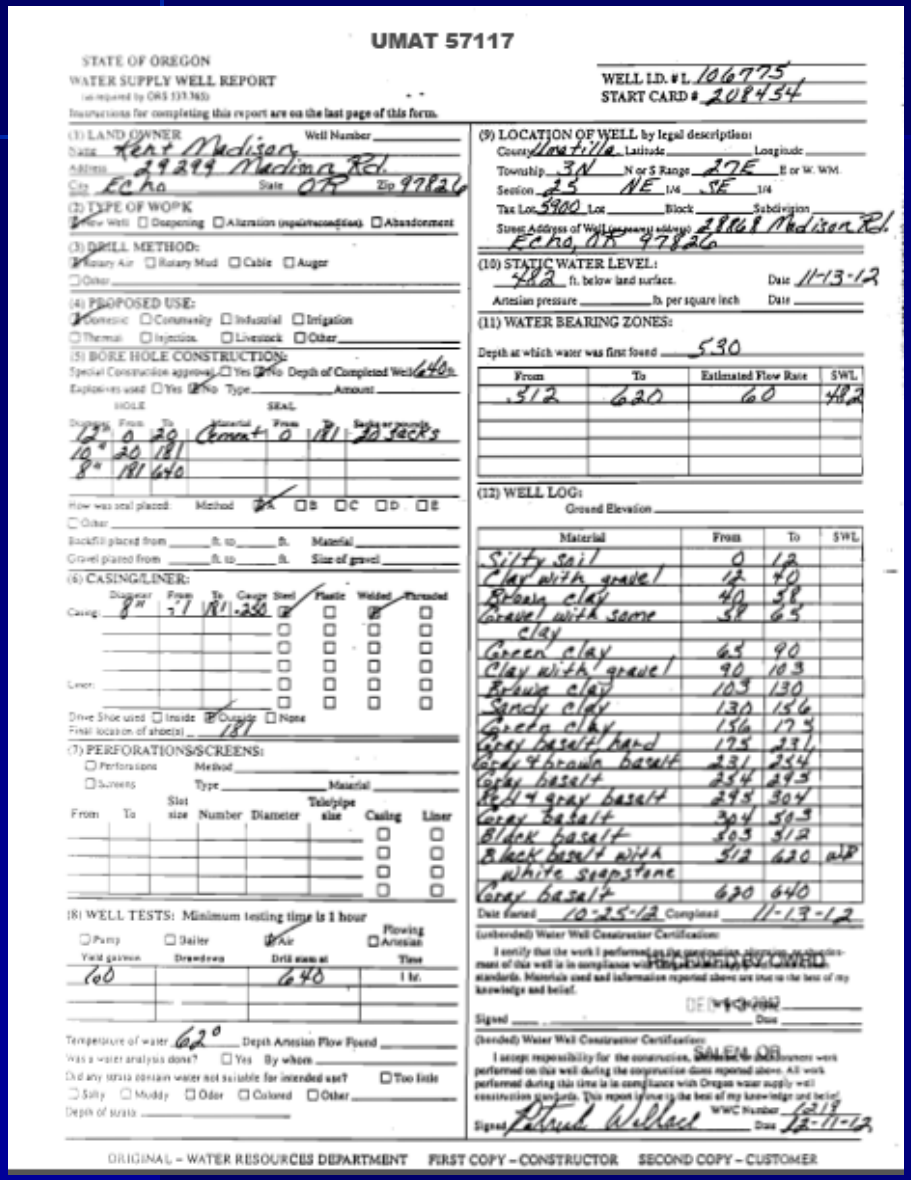




Protection of Senior Users

Next: Develop a data file for each well with available information, including information provided by the well owner

Well log information from locally drilled wells



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STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 106775
START CARD # 208434

(1) LAND OWNER — Well Number
Name Kent Madison
Address 29299 Madison Rd
City Echo State OR Zip 97826

(2) TYPE OF WORK
☒ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☒ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☐ Other

(4) PROPOSED USE:
☒ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approved ☐ Yes ☒ No Depth of Completed Well 640 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12"	0	20	Cement	0	181	20 Sacks
10"	20	181				
8"	181	640				

How was seal placed: Method ☒ A ☐ B ☐ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8"	+1	181.250		☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☒ Outside ☐ None
Final location of shoe(s) 181

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Telescope/ size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
60		640	1 hr.

Temperature of water 62° Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata

(9) LOCATION OF WELL by legal description:
County Umatilla Latitude Longitude
Township 3N N or S Range 27E E or W WM
Section 25 NE 1/4 SE 1/4
Tax Lot 5900 Lot Block Subdivision
Street Address of Well (if any) 29868 Madison Rd.
Echo, OR 97826

(10) STATIC WATER LEVEL:
482 ft. below land surface. Date 11-13-12
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 590

From	To	Estimated Flow Rate	SWL
512	620	60	482

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Silty soil	0	12	
Clay with gravel	12	40	
Brown clay	40	58	
Gravel with some clay	58	65	
Green clay	65	90	
Clay with gravel	90	103	
Brown clay	103	130	
Sandy clay	130	156	
Green clay	156	175	
Grey basalt hard	175	231	
Lady & brown basalt	231	254	
Lava basalt	254	295	
Red & grey basalt	295	304	
Lava basalt	304	503	
Black basalt	503	512	
Black basalt with white soapstone	512	620	wb
Lava basalt	620	640	

Date started 10-25-12 Completed 11-13-12

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with [illegible] standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number
Signed Date

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1219
Signed Robert Wallace Date 12-11-12

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

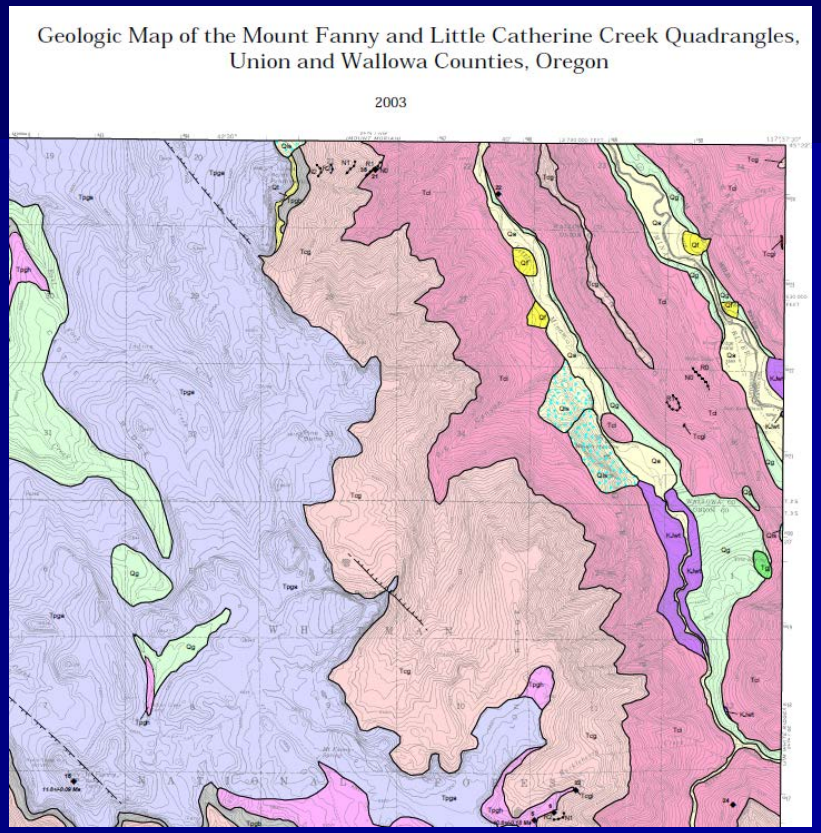
Provides:

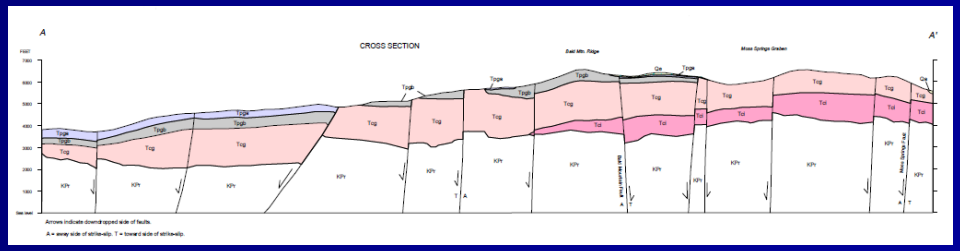
- Geologic materials
- Water bearing zones at depth
- Well yield
- Water level data
- Aquifer developed

Geologic Mapping

Provides:

- Local surface and subsurface geology
- Distribution of high production units
- Distribution of low production units





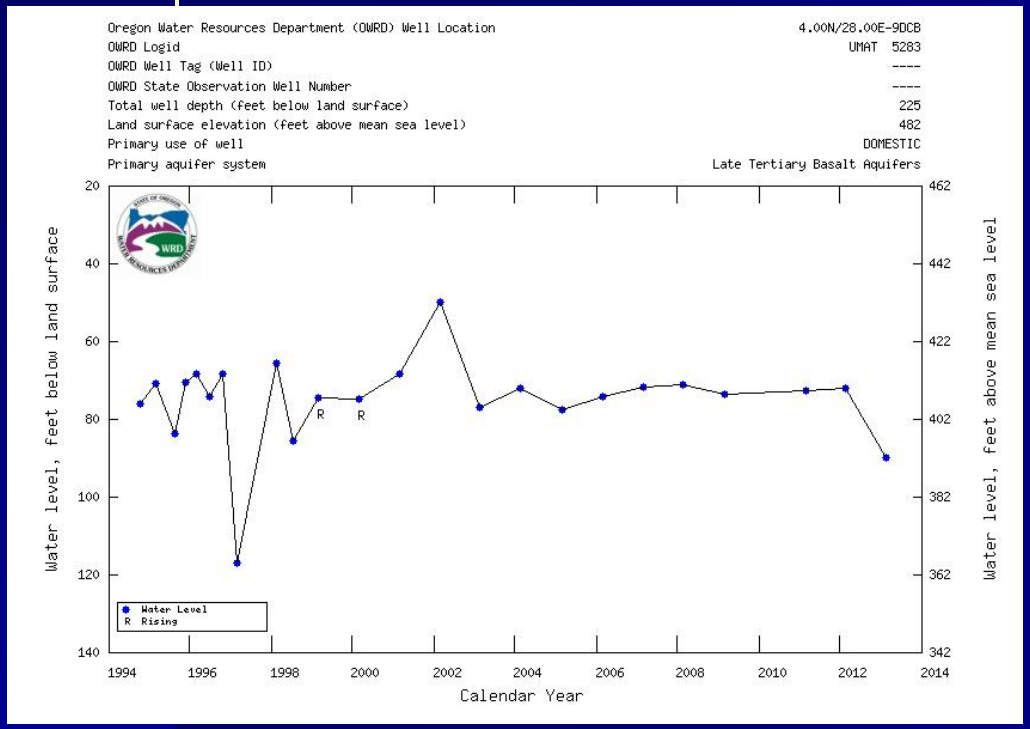
Aquifer Testing

Provides:

A broad characterization of aquifer hydraulics

- Aquifer parameters
- Relationship of drawdown v. distance
- Presence of hydraulic boundaries

Groundwater-level data



Provides:

- Depth to water table
- Stability of the GW resource
- Direction of horizontal flow
- Vertical gradient between aquifers
- Gradient between GW and SW

Protection of Senior Users

Basin Studies
Compile all the research at the basin scale

Provides:

- Broad understanding of GW and SW interaction
- Understanding of aquifer behavior
- Understanding of aquifer capacity for further development

Protection of Senior Users

Before regulation, rules require findings of:

- Substantial interference
- Regulation must be timely and effective

Protection of Senior Users

- Department staff always use sound hydrologic science and principles
- Local and site specific information are utilized


Questions ?
STATE OF OREGON
WRD
WATER RESOURCES DEPARTMENT
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