

DRAFT DRMT Zoom Meeting Notes February 19, 2021

Prepared by Shawn Hines, Jamestown S'Klallam Tribe

DRMT Members Present: Hansi Hals/Jamestown S'Klallam Tribe, Robert Beebe/Riverside Property Owners, Cathy Lear/Clallam County DCD, Ann Soule/City of Sequim, Ben Smith/Dungeness Water Users Association, Tony Corrado/Protect the Peninsula's Future, Judy Larson/Protect the Peninsula's Future, Jenna Ziogas/River Center, Mike Gallagher/Ecology, Shawn Hines/JST

Others Present: Heather Watts/Clallam County, Judy Larson/PPF, Carolyn Dawson, Phil Martin/citizen, Bob Simmons/WSU Extension, Sissi Bruch/JST, Marguerite Glover/Sequim Realtors Association, Emily Dick/WWT, Joel Green/Streamkeepers, Peter Schwartzman/PPG



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DRMT Notes.docx

I. **Introductions**

Hansi called meeting to order, introductions.

- No January notes to review (no meeting in January).
- Note-taking discussion: Clallam County no longer has note-taking capacity, but hopefully will be hiring someone in future. Ben suggested that if any DRMT organization has staff for note-taking, let us know. Hansi recommended that Executive Committee discuss. Shawn to type up today's meeting notes.

Public Comment

- Clallam County hired new Streamkeepers Coordinator, Joel Green. Joel introduced himself and shared some of his background/experience.
- Conservation District election coming up for supervisor position. Scott Chitwood's position is expiring, and he's not reapplying. Three candidates: Lori DeLorm, Robert Majure, Nina Sarmiento. Information about candidates and how to participate in election is on Conservation District webpage: <https://clallamcd.org/elections-appointments>
- Clallam and Jefferson Conservation Districts working on MOU whereby half of Joe's time will be contracted to Jefferson. Joe will transition out of Executive Director position, and will mainly focus on water conservation efforts. There are plans to replace Director position; job description to be posted soon.

II. **Dungeness Groundwater Model Panel Discussion**

Peter Schwartzman – model basics

- Peter provided joint Powerpoint presentation with Ann; started off with Dungeness 2008 GW Flow Model Basics.
- Noted that he and Ann were involved in model back in 2006-2008. Ann was project mgr, and Peter was consultant hydrogeologist to the County. Model released in 2008.
- Basics about the model, hydrogeological and numerical. Described how model is 3D structure of multiple cells of rows and columns. Model will calculate flow between cells using hydrological equations.
- Modeling process includes conceptual (hydrogeological) model, constructing numerical model, sensitivity, calibration (steady state and transient), predictive simulations and validation.

Ann Soule – model development/history

- Started in early 1980s with USGS's Brian Drost producing hydrology reports. Started with simple conceptual model, and turned it into very simple numerical model. Wondered what would happen to wells if irrigation ditches were not there.
- In mid-1990s, there was a lot more focus on water resource management; a more robust model was desired by policy makers. Ann worked at Clallam County at the time. Submitted grant application to pay for update of the early model.
- USGS was hired to design data collection plan and define hydrology in preparation for model. Resulted in Blake Thomas work published in 1999.
- A new version of model came out in 2003, which used Thomas's work. 2003 model developed by Foster Wheeler and TetraTech. Tom Martin was also involved. Peer review conducted.
- 2004/05, PGG hired to refine model further. Produced Supplemental Characterization. Funded mainly by Ecology. Released in 2008.
- Supplemental Characterization: included explorations of deep-deep aquifer occurrence, small streams analysis (with help from Streamkeepers data), GW inflow at Southern Model boundary, wetlands and evaporative loss, head differences between aquifers, water level responses to climatic trends.

Peter Schwartzman – refinements made to create 2008 model

- Cleaned up layering of previous model, marine connection, calibration targets, tightened up boundary conditions.
- Specified wells, and injections wells in model.

- Used 2 different boundary conditions to represent rivers/streams.
- Included recharge (estimated from USGS) – precipitation, irrigation, wastewater.
- Wetlands and other areas of shallow groundwater.
- Each layer needed to be assigned aquifer properties. This was one of the big things that was varied and adjusted during calibration based on data.

Ann Soule - Applications of 2008 model after calibration

- There was interest in aquifer recharge as a possible way to mitigate impacts from well withdrawals, one of the first applications.
- Aquifer storage and recovery; Ecology and County did large study on this.
- Streamflow depletion – via groundwater pumping; the ultimate result was the mitigation calculator referenced in the Instream Flow Rule.
- Note, all the reports related to this are on Clallam’s website.
- Ann showed slides of model applications related to augmentation or infiltration: such as areas suitable for infiltration/aquifer recharge.
- Peter acknowledged that there’s often more than one set of parameters that gives a satisfactory calibration; in this case, provided two different calibrations to Ecology. Ecology then summarized stream impacts of different aquifers.

Questions:

- What are layers 6 and 7 referring to? *They represent sediments (undifferentiated deposits) beneath deep aquifer. Used 2 layers for that. Concluded at the time that, although there may be deep, deep water-bearing zones, there didn’t appear to be a connected layer.*
- Where would the water come from to be injected into the groundwater for augmentation? *There are times when Dungeness River could possibly be used if water right could be obtained (shaving off high flows), reclaimed water, stormwater, stored water (with water right). Aquifer recharge is occurring right now.*

Peter Schwartzman – Model calibration

- Wanted to know how accurate, how well did it simulate what we know about the system.
- Followed two year intensive data collection (late 1995 to 1997), extensive volunteer effort and trained technicians, as well as research and empirical data.
- Parameters used at the time: precipitation, water use and septic recharge, irrigation flows, water levels in wells, Dungeness River stage.
- Note – precipitation during that time period was above average (wetter than normal). What does that do model (calibrating to a wet period)? They ended up splitting the difference and averaged wet and normal precipitation for calibration purposes.
- Steady state model – model where everything stays same, no variations, long term average; usually how you start the calibration. Then look at transient, time-varying simulations.
- Used steady state and transient targets.
- Difference between observed and predicted was within range of good model calibration.
- Conducted sensitivity analysis to determine how far off model was from predictions.

Model Improvement Recommendations:

- Higher Resolution Grid
 - Nested grids in MODFLOW-USG
- Improved Hydrogeologic Characterization
 - Additional Layering for Shallow Aquifer System
- Representation of Surface-Water Features
 - “Connected Linear Network” in MODFLOW-USG

Model Application Recommendations:

- Best Suited to Regional & Shallow
 - Uncertainty increases with depth
 - Cannot replicate complexities of shallow “system”
- Recent Changes in Irrigation Systems
- Run Both Versions of Calibrated Model
- Climate Change & Sea Level Rise
 - Warmer temperatures reduce recharge
 - SL rise raises water table and intercepted baseflow

Additional Characterization Rec's

- Baseflow Gains/Losses
- Aquifer Connections to Marine Water
- Head Differences b/t Aquifers
- Complexity of "Shallow Aquifer System"
 - Lower Bell and Matriotti Creek areas
 - Effect on transient recharge processes
- Hydraulic Properties in Middle & Deep Aquifers
- New Information on "Deep-Deep" Aquifer?
- Incorporate Recent Improved Characterizations
- **MONITOR, MONITOR, MONITOR!!!**

Additional Calibration Rec's

- Model Validation (Changes from 1995-present)
- Long-term Historic Transient
 - Focus in K_v and Storativity
- City of Sequim Dataset
 - Significant Aquifer Tests at Wellfields
 - Age Dating (Isotope) Data
- Marine/Tidal Responses
- Better Recharge Estimation (*short-term transient*)

Ann Soule - Summary of changes since model was last calibrated (i.e., important parameters to track)

- Ann showed graphs of various data parameters for available time periods: Sequim precipitation; temperature (has a big impact on recharge); snowpack trends (this is where the biggest changes are, which is reflected in streamflow runoff in Dungeness, which in turn effects recharge (because 25% of GW budget comes from infiltration via Dungeness River channel); mean monthly river flow; City of Sequim water use; irrigation changes (such as piped ditches).

Questions:

- Is there any info obtainable on northward groundwater flows - what is the quantity of this flow? And does the model accommodate this "leakage" from all the modeled aquifer layers? Does the water rule acknowledge that northward groundwater flow can be tapped by wells, or does it simply assume that wells only affect aquifer levels as if they were static pools? *Yes, the model simulates occurrence of groundwater and where it discharges to, and it can simulate leakage through aquitards.*
- Before spending a lot on model improvements, what about surveying original wells and seeing how well water depths have changed in past 20 years? *Yes, Ann and Peter agreed that looking at trends (of various parameters, not just wells) would be helpful as precursor before spending any money on recalibrating.*
- Hansi asked what folks were thinking regarding where to proceed from here. Suggested that a future conversation could discuss next steps and the recommendations provided, and what group would hold that bigger conversation. Ben concurred. No specific date was suggested.

Emily Dick – Dungeness mitigation

- Showed examples of products that mitigation calculator can produce using information from model; it can show how much a parcel's consumptive use can impact streams in water rule area, for example.
- Can then look at mitigation certificates (what needs to be offset).
- Calculator is also used to represent positive credits.
- All budgeting is done yearly. Example summary of mitigation balance tracking sheet for 2020 (from Emily's slides). This summary sheet shows everything was fully mitigated except Bagley, which then utilized reservation.

Mitigation Balance Tracking Sheet for Year 2020								
Item	CREDITS AND OBLIGATIONS							
	Bagley	Siebert	McDonald	Dungeness (incl. Matriotti)	Meadow	Cassalery	Gierin	Bell
A. Obligations								
Certificates-Outdoor	0.090	0.107	0.254	6.626	0.155	1.229	0.802	0.139
Certificates-Indoor	0.090	0.063	0.272	3.647	0.050	0.434	0.343	0.076
Subtotal Annual Obligations	0.180	0.170	0.526	10.273	0.205	1.663	1.145	0.215
B. Credits								
Instream Flow	-	-	-	45.000	-	-	-	-
Recharge	0.145	0.540	14.293	55.531	0.206	2.755	2.220	0.317
Subtotal Credits	0.145	0.540	14.293	100.531	0.206	2.755	2.220	0.317
C. Reservation (Maximum Depletion Amounts)								
Reservation Amounts Set in Rule	7.241	15.929	2.172	550.284	18.826	0.941	7.892	1.665
D. Use of Credits for Obligations								
Credits used for Certificates-Outdoor	0.090	0.107	0.254	6.626	0.155	1.229	0.802	0.139
Credits used for Certificates-Indoor	0.055	0.063	0.272	3.647	0.050	0.434	0.343	0.076
Credits Remaining	-	0.370	13.767	90.258	0.001	1.092	1.075	0.102
Obligations Remaining	0.035	-	-	-	-	-	-	-
D. Accounting and Reservation/Credit Balances if Reservation Can be Used to cover Indoor & Outdoor Obligations								
Reservation used for Remaining Obligations	0.035	-	-	-	-	-	-	-
Unmet Obligations	-	-	-	-	-	-	-	-
E. Accounting and Reservation/Credit Balances if Reservation Can be used only to cover Indoor Obligations								
Outdoor Obligations not met by Credits	-	-	-	-	-	-	-	-
Indoor Obligations not met by Credits	0.035	-	-	-	-	-	-	-
Reservation used for Remaining Indoor Obligations	0.035	-	-	-	-	-	-	-
Unmet Obligations	-	-	-	-	-	-	-	-

- Mike Gallagher noted that the subtotal annual obligation will get bigger and bigger in future, and credits remaining will get smaller as time goes on.
- Ben wondered about incentives to drill in second aquifer (where it has half the effect on groundwater). Potentially issue credit to drill to second aquifer up front. Emily said there is an economic incentive through this program for developer to drill deeper, since they would have lower consumptive use, and are charged based on consumptive use.

Mike Gallagher – Steps and Process needed to update the Dungeness GW Model

- Mike noted that the Dungeness Rule sites the Dungeness GW Flow model in two places, so the model is necessary to implement the Rule. Taken from Mike’s slides:

Steps needed to change or update the model

1. A rationale or compelling reasons to do so
2. Broad support (Tribal, County, Irrigator, City, Interest Groups, Individuals)
3. A year or two of new data collection on water levels from several dozen existing wells, streamflow measurements, spring discharges, managed aquifer recharge inputs, etc.
4. A recalibration of the groundwater model with the more recent data
5. **Funding (money) to pay for Steps 3 and 4**
6. If an updated model is created, then the Dungeness Rule (WAC 173-518) would need to be amended. This requires Ecology resources and staff and may not be a high enough priority when weighed against the need for other rule development or rule amendments across 10 different environmental Programs:
 - Air Quality, Hazardous Waste, Solid Waste, Nuclear Waste, Toxics Cleanup, Spill Response, Environmental Assessment, Shorelands, Water Quality and Water Resources
 - The agency could be “petitioned” to amend a regulation, but Ecology makes the final decision on any petition.
 - Competing priorities and available staffing and resources are some of the factors considered by the agency when reviewing petition requests.

Summary of Mitigation Certificates Issued

Year	Dungeness Water Exchange: Instances of Mitigation Issued by Year and Package								
	Indoor	Outdoor		Stockwater			Water Rights		
		Basic	Extended	5 Animals	10 Animals	15 Animals	Indoor	Outdoor	
2013	18	0	2	0	0	0	0	0	
2014	48	5	4	0	1	0	2	2	
2015	31	2	3	0	1	0	0	0	
2016	66	15	6	1	0	0	0	0	
2017	63	12	9	1	0	1	2	0	
2018	61	8	4	1	0	0	0	0	
2019	62	7	7	1	0	0	1	1	
2020	56	5	7	1	0	1	0	0	
Totals	405	54	42	5	2	2	5	3	

515 Mitigation Certificates issued by DWE between January 2013 – December 2020

405 (79%) for indoor domestic water
 96 (19%) for basic or extended outdoor water
 9 (~2%) for stockwater use
 5 (~1%) for water rights

- Summary of what's been done with mitigation certificates (From Mike's slides):

Summary from January 2013-Present

Mitigation Packages Sold*	Consumptive Impact (AFY)
Indoor- 405	6.80
Basic Outdoor- 54	4.83
Extended Outdoor- 42	8.46
Stock Water (5 animals)- 5	.17
Stock Water (10 animals)- 2	.13
Stock Water (15 animals)- 2	.20
Water Rights- 5	2.95
TOTAL (515)	23.56

} = 13.3 AFY

Projected at least 40 years of supply remaining Total AFY Purchased for the Exchange = 175 AFY 13.4% used in 8 years	TO DATE: 7.5% of the 175 AFY available in the Exchange water bank has been used for the 96 outdoor mitigation certificates.
96 Basic and Extended Outdoor Mitigation Certificates [18% of total Certificates issued to date] have depleted the Reservation by 13.3 AFY (56%) while 405 Indoor Mitigation Certificates [78% of total Certificates issued to date] have depleted the reservation by 6.8 AFY (29%).	

- Lengthy discussion about green/yellow area. Mike spoke to several of Phil's comments about this.
- Mike reiterated that if we didn't have the water bank, we wouldn't have been able to allow well-drilling. Water bank established a bucket of water for future users to offset. Because yellow area is up-gradient of irrigation diversions, from that area north, there is water legally and physically available thru water bank thru mitigation; up gradient of that in yellow area, no water available legally (due to court cases).
- Phil had comments about how bedrock is expressed by model. Peter said the application of this tool was done by Dave Nazy at Ecology. True, model doesn't simulate bedrock. Dave took parcel number, assigned it to first active model area above it. Couldn't be used to estimate impact of bedrock well, since it didn't simulate that. Dave was conservative, assumed it effected it in first active portion. Hard to predict interactions with bedrock. Probably would have moved withdrawal to front of bedrock.
- Phil expressed objection to yellow area, how it originated. Hansi acknowledged the sensitivity about this topic, and that this forum won't provide all the specific answers. Hansi also commented that if we know information can be refined or improved, and can be done effectively, steps could be taken, if that gets decided in discussions of next steps.
- Mike also acknowledged that some are not pleased with yellow area, but as rule implementer, some of the court cases have taken some of the tools out of our tool box.

III. Streamflow Restoration Grants Update, Mike Gallagher

- Mike provided status of watershed planning and streamflow restoration grant awards.
- 2 plans adopted by Feb 1, 2019; 5 plans adopted by Feb 1, 2021; 8 draft plans out for local review, to be adopted by June 30, 2021.

- 2019 Pilot Competitive Grant Round: 16 projects selected, \$20 million offered, including almost \$4 million for Dungeness off-channel reservoir. Implementation of pilot grants underway.
- 2nd Competitive Grant Round: selected 21 projects, \$22 million. Scoping under way.
- Planning, technical support: \$8 million
- Next competitive grant round: for budget cycle July 2021-June 2023. Budget request includes \$40 million in bond funding in Governor’s budget for this next grant cycle. Final, approved budget expected summer 2021. Ecology will evaluate potential needs for a Guidance Update. Schedule for past two rounds has been 5 months each. Realistic scenario: 3rd grant round to occur in Winter 2021/Spring 2022.
- Shawn sent out focus sheet prior to meeting with description of all the grants awarded. Hansi and other gave many thanks to all presenters of today’s topics. Very well done.
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IV. Other Orders of DRMT Business, Announcements and Standing Agenda Items

- Standing Item: Project Updates and/or Announcements:
 - Ann commented that it’s nice to see the snowpack!
 - Hansi updated on levee setback. Clallam moving full steam ahead on Phase 1. The Tribe is working on the portion of levee (about 2 miles worth) that is immediately upstream of Phase 1 project. In design and permitting, attempting to sequence with County’s construction. Fun and difficult.
 - Ben reminded again about Conservation District position opening and elections. See their website. Share the news!
- Standing Item: review next agenda for any suggested additions
 - Confirmed: ELJ update by Tribe.
 - Confirmed: River Center expansion and educational program updates.
 - Forest Service will update on Canyon forest project at a future meeting.
 - Native plant gardens in our watershed in the works for a future update.
 - Bob Simmons: grant to provide educational outreach on stormwater strategies in rural areas; can give presentation at future meeting.
 - Ann – noted that County Public Works is working on new Stormwater Ordinance. It’s very strong, will adopt 2019 Ecology Stormwater Manual, in part. Would be good for DRMT to know more about it.

Public Comments

Cathy: soon there will be a notice about an “evening with streamkeepers”; Joel will introduce himself and talk a bit about his plans for Streamkeepers, and there will be a video about Ennis Creek shown. Keep a look out in your email.

Meeting Adjourned