

# KPU



*Your Community, Your Utility*

**General Manager**  
334 Front Street  
Ketchikan, AK. 99901

(907) 228-5603 phone  
(907) 225-5075 fax

TRANSMITTAL MEMORANDUM
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TO: The Honorable Mayor and City Council

FROM: Karl R. Amylon, General Manager

DATE: June 12, 2019

RE: **Project Status Reports of the KPU Operating Divisions – May 2019**

Attached for City Council review are the project status reports of the KPU operating divisions for the month of May 2019. Should the City Council have questions regarding the Division Managers reports, staff can respond accordingly.

**MANAGER'S REPORT**  
**SALES, MARKETING & CUSTOMER SERVICE DIVISION**  
**May 2019**

Verizon Wireless device dollar sales were 33% below May 2018. Sales have been softer in 2019 due to the significantly higher price of the newest Samsung and iPhone models, which account for the majority of sales. The iPhone can retail for as high \$1590 and the new Samsung are priced up to \$2000. Verizon technical assistance requests remained high at 75 visits for May.

KPU Customer Service continued to experience higher than normal call volume in May, in line with previous months of 2019. Most calls involved explaining the very high diesel surcharge. Printing customers' historical consumption reports to show that their consumption had remained the same or had decreased calmed some upset customers. Others were convinced that their meters were faulty, and/or questioned the math calculations on the electric bills. As stated in previous reports. KPU Customer Service has continued to be a model of power conservation, utilizing 50% of the available overhead lights. The large TVs in the office have also been turned off to conserve energy.

KPU's combined active and vacation-hold IPTV accounts in May remained flat to April. Although customers have been eliminating cable to save money and to take advantage of video streaming on the internet, KPU has gained many customers porting away from GCI, who just enacted a significant price increase. Combined active and vacation-hold Double play accounts were 4% higher than last year and 2% higher than the previous month. Over 340 double play subscribers have opted for the unlimited data option. KPU added a stand-alone "no phone line" option that allows customers to save a small amount of money by not requiring the phone line. This was due to changes in federal regulations, which requires fees associated with the phone line, but not the line itself. There was a 26% increase in standalone customers from April to May, as most new customers opted to not have a phone line. The federal change also allowed KPU CSRs to save customers that would have disconnected due to the need for a phone line.

KPU Business techs worked to provide fiber services into many locations in the downtown core, which allowed customers to access the faster internet speeds on more stable fiber connections. This contributed to additional businesses porting services to KPU from GCI.

In May, KPU TV filmed Kayhi Softball, and Soccer. Many of the sporting events were held at the same time in separate locations, so only certain events could be live streamed but all were filmed. Other events and meetings which were covered were Taste of Southeast with Chef Bev, In The Spotlight: KAAHC, Houghtaling Arbor Day, The Blessing of the Fleet and the Lumberjack Community Show, Ketchikraft House Signs with AJ, and High School graduation, which was also live-streamed for family who could not attend. Lastly, several community meetings with City Council were filmed and put on-air as well as on the City website.

KPU Marketing finalized creation of an electric conservation campaign to educate the community. A presentation was made to Chamber of Commerce to educate businesses on ways to conserve. This was the launch of the “Energy Conscious Business” campaign. Flyers, posters and mailers were created and distributed. Businesses which conserve are featured in social media to encourage others to conserve. Marketing created a conservation postcard which was sent to every resident and business in Ketchikan. The KPU Electric webpage was reworked by Marketing to feature conservation tips, to answer common questions regarding power generation, power outages, alternative energy sources, and how the diesel surcharge works.

# **MANAGER'S REPORT**

## **ELECTRIC DIVISION**

### **May 2019**

#### **Electric Shop and Meters**

- Meters. During the month, there were forty-nine (49) meter exchanges:
  - Thirty-five (35) changes from manual meters to RFN (Radio Frequency Node) meters.
  - Nine (9) PLC (Power Line Communications) meter to RFN meters.
  - One (1) manual meter to PLC meter.
  - Two (2) manual meter exchange.
  - Two (2) PLC meter exchanges.
- Operations. Replaced lights and photo cells for lighting system throughout Ketchikan. Installed new PLC controls at the No. 1 Intake. Investigated, performed troubleshooting, and repairs for issues with Beaver Falls some detection system, Bailey Generator No. 3 annunciation system issues, Bailey air compressor system, Ketchikan diesel generator main circuit breaker and bus connections, and Pt. Higgins CAT No. 2 electrical fault. Continuing metering upgrade for the Yukon system with Eaton/Cooper. Installed communications and power at the Mud Bight generation site, controller and power for the Heckman recloser/breaker. Service disconnects/reconnects. Continued support for the KPU Diesel campaign and rental program.
- SCADA. Completed SCADA programming for the Mud Bight generation site. Investigated, performed troubleshooting, and repairs for the SCADA system database. Continuing training new employee on the SCADA system. Records management activities and SCADA upgrade planning.
- Water Department. Investigated, performed troubleshooting, and repairs for the Carlanna Lake level sensor and Chlorinator Plant Ultraviolet Transmittance (UVT) monitoring device. Replaced home switch at the Water UV Plant. Installed heating system for UV Plant propane system.
- Harbors. Cleared six (6) harbor trouble tickets. Made cable repairs on Bar Harbor Float 8.
- Telecommunications. Coordination for generation sites.

#### **Contingency Diesel Project**

- Currently, there are four rental generators with a total capacity of 6.4MW.

## **Outages and Events**

- No reported system outages.

## **Plant/Fleet Maintenance**

- Continued diesel generation and fueling operations (Bailey, NPH Sub, UV site, KTN Sub site, Ward Cove No. 1, Ward Cove No. 2).
- Began plumbing in 5,000 gallon diesel fuel tanks to three (3) of the rental Cummins generators.
- BAG3: completed repairs associated with the April piston failure, returning the unit to service; repaired radiator leak.
- BAG3 Contract No. 19-07 piston & liner replacement: City & Fairbanks Morse attorneys in discussion regarding particulars of contract language and Alaska Department of Labor requirements.
- BAG4: repaired oil leaks; began adjusting valves and servicing fuel injectors.
- Cat 1: repaired an anti-freeze leak.
- Cat 2: repaired an exhaust leak.
- Completed service of speed switches on Beaver Falls No. 3 & No. 4
- Repaired the log boom at Lower Silvis Lake

## **Regulatory and Dam Safety**

- Researched documents and data for the FERC Part 12 inspections, Potential Failure Mode Analyses, and other studies being conducted by Schnabel Engineering for the Ketchikan Lakes and Beaver Falls projects. Pre-inspection meeting with FERC staff.
- Coordinated a site visit for consultants and regulatory personnel involved with the Beaver Falls relicensing project.
- Researched and provided data in support of new dispersion modeling analysis by SLR for the Bailey Power Plant.
- Prepared and filed an application for 2018 Whitman Lake generation under the U.S. Department of Energy's EAct 2005 Section 242 Hydro Incentive Program.

## **SEAPA**

SEAPA held a "special" Board meeting on Wednesday, May 29, telephonically. The meeting agenda was brief with the only item being a request for the Board to change the SEAPA's fiscal period from mid-year (July 1<sup>st</sup>) to calendar year (January 1<sup>st</sup>). Trey Acteson, CEO stated this better aligns with the Agency's business and work processes.

Meanwhile, transition documents are nearly complete for the Swan Lake O&M transition from KPU to SEAPA. It is anticipated this will be completed by June's regularly scheduled Board meeting in Wrangell, June 19, 2019. As always additional information can be found on SEAPA's web site at:

<http://www.seapahydro.org/SEAPA-notice-meetings.php>

## **Swan Lake**

The Swan Crew activity for this month included:

- Log boom inspection & repairs
- Flashboard and trigger re-work
- Storage shed erection and lighting
- Barge delivery and re-loading scrap for return
- Drainage culvert repairs & knotweed mitigation
- House 103 water heater replacement



Log boom maintenance



Flashboard trigger work on Dam







Culvert repair and knotweed mitigation



## Transmission & Distribution Work

- Completed rebuilding the south end of Roosevelt Drive, including the replacement of three (3) primary poles.
- Began and completed the rebuild of the north end of Roosevelt Drive, including the replacement of three (3) primary poles, two (2) guy-stub/service poles, and replacing fiberglass "twiggy-arms" with wooden cross-arms.
- Replaced an additional primary pole on the southern end of Sunset Drive.
- Held a service pole with digger/derrick truck #97 on Forest Park Drive in support of a sewer project.
- Completed preparation of the Mud Bight Generator No. 1 site, in advance of the rental Cummins generator being relocated from the UV site, including setting & framing a new 34.5kV riser pole and relocating the generator transformer.
- Completed a myriad of service work throughout the system



Mud Bight Generator No. 1 Site Preparation



Replacing a primary pole on Roosevelt Drive

## Water Management/Diesel Supplement

- Loads for the month of May were much lower than average. The past 7-year average for May being 13.1 GWh with this May being 12.0 GWh. This was in part due to the fact that this May was one of the warmest and driest on record. Additionally, fish processing was minimal with the major openers canceled or delayed.
- Precipitation for this May was a record low of 2.8 inches with the norm for Ketchikan in May being just above 9 inches.
- Diesel generation for May totaled 2.1 GWh or roughly 17% of KPU's generation for the month.
- Local lake level conditions continued down with Swan, Ketchikan, Whitman, and Silvis Lakes being lower than this same time last year. Whitman provided 481 MWh of generation. Swan Lake remained on-line with one unit for a monthly total of 5,369 MWh, which is actually over the 7-year average of 5,187 MWh.
- Tyee Lake responded well to snow melt for the period, enough for the demands of the Northern Communities, without the need for diesel.
- SEAPA continued its suspension of exports from Tyee to KPU which began on Monday, September 17, 2018.
- Cumulative levels for, Swan, and Tyee lakes can be seen in the graphs below (source SEAPA). Lake levels and "net" generation are shown in a separate report.

**MANAGER'S REPORT  
TELECOMMUNICATIONS DIVISION**

May, 2019  
Operational Issues

**TELECOMMUNICATIONS DIVISION MANAGER**

Last summer through last winter we struggled to fill several key Telecom management/engineering positions – due primarily to ‘market’ issues relative to compensation. Ultimately with Council’s support we were able to fill 2 of the 3 vacant positions. To-date I am very pleased with the subsequent progress on any number of key initiatives in our engineering operations. I refer you to the Telecommunications Engineering Department Summary contained in this report – regarding ongoing activity and progress.

We continue to remain actively engaged in various permitting and related activities – regarding the proposed undersea fiber to Prince Rupert. Most recently the Ketchikan Borough Assembly approved a very important/key easement for our proposed Mountain Point shore landing. Early on the City Manager’s office was very helpful in discussing related issues with Borough staff – thank you for the assistance.

**REGULATORY UPDATE**

Summary

The Alaska Telephone Association has been working on new state legislation – SB83 - that would lessen regulatory oversight due to the presence of competition in most markets. SB83 passed the House and Senate on May 14<sup>th</sup> and was sent to the Governor. SB83 recognizes the telecom transformation that has occurred since many of Alaska’s telecom statutes were adopted in the 1970’s and modernized those statutes.

Other regulatory issues of interest are as follows:

The FCC issued a public notice on May 13, 2019, announcing Chairman Pai will convene a summit on July 11, 2019, focused on the industry’s implementation of SHAKEN/STIR, a caller ID authentication framework to combat illegal robocalls and caller ID spoofing. The summit will showcase the progress major providers have made in deploying SHAKEN/STIR and provide an opportunity to identify any challenges to implementation and how best to overcome them. Stakeholders interested in participating in the summit are encouraged to contact the Wireline Competition Bureau by June 11, 2019.

**Reports and Filing**

**FCC Employment Report filed**

KPU Telecommunications filed the FCC Form 395 Employment Report on May 6, 2019. This required report tracks carrier compliance with rules requiring recruitment of minority employees and also requires all common carriers to report any employment discrimination complaints they received during the past year.

### **Study Area Boundary Certification**

KPU certified its annual study area boundary with the FCC. The FCC collects data on the study area boundaries of all incumbent local exchange carriers (ILECs) to use in the implementation of certain universal service programs.

## **TELECOMMUNICATIONS PLANT DEPARTMENT**

### **Summary**

#### **Outside Plant Construction and Splicing:**

Projects Completed:

- Fiber terminals 2703-2855 Tongass Ave
- Plant Maintenance
- Pole Transfers

#### **Installation and Repair:**

- The installation and repair crews completed:
  - 81 service orders
  - 56 trouble tickets
  - 30 fiber drops

<b>2019</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>
SO	73	56	75	68	81
TT	115	97	71	79	56
FD	24	25	24	22	30
<b>Total</b>	<b>212</b>	<b>178</b>	<b>170</b>	<b>169</b>	<b>167</b>

#### **Safety:**

The safety topic for May was working safely with chain and sling lifting.

## **TELECOMMUNICATIONS ENGINEERING DEPARTMENT**

### **Summary**

#### **Engineering:**

- 4G/LTE / Wireless

We received an analysis from JDR Telecom on adjusting several wireless parameters to improve service coverage for multiple sites in-town. Expected implementation is in first half of June and we are optimistic about the results of these changes for our 4GLTE service.

  - Project to migrate WEST end cell site to the Hospital ongoing
  - Continued planning of project to build new cell site over at the Ketchikan Public Library
  - NEC Microwave maintenance on High Mountain transmitter scheduled due to errors on Radio #5 which is currently shutdown
- IP Engineering
  - New Qwilt appliance arrived and in process of implementation
  - New router added at K71 for capacity growth
  - New ipv4 address space implemented in several locations due to growth
  - New project to add 10G capacity to business customers

- Video Engineering
  - Ongoing planning for Minerva10 middleware upgrade
  - New Vubiquity Feed Control Manager installed and operational
  - Weatherplay channel up and operational
  - Tennis channel up and operational
- Voice Engineering
  - Broadworks security review completed for UC-One
  - AT&T LD CIC Code cutover 90% completed
  - Broadworks certification training for PBX (Hosted Business) team completed
- Systems Engineering
  - Rewiring project to clean-up the configuration and wiring of the datacenter 60% complete
  - Efforts underway to migrate eTics database to Telephone's Esri project
  - Ward Cove Group datacenter VM installed and operational
  - Bios and other maintenance updates for vSAN 50% complete
- Facility
  - Eichner remote power plant upgrade completed

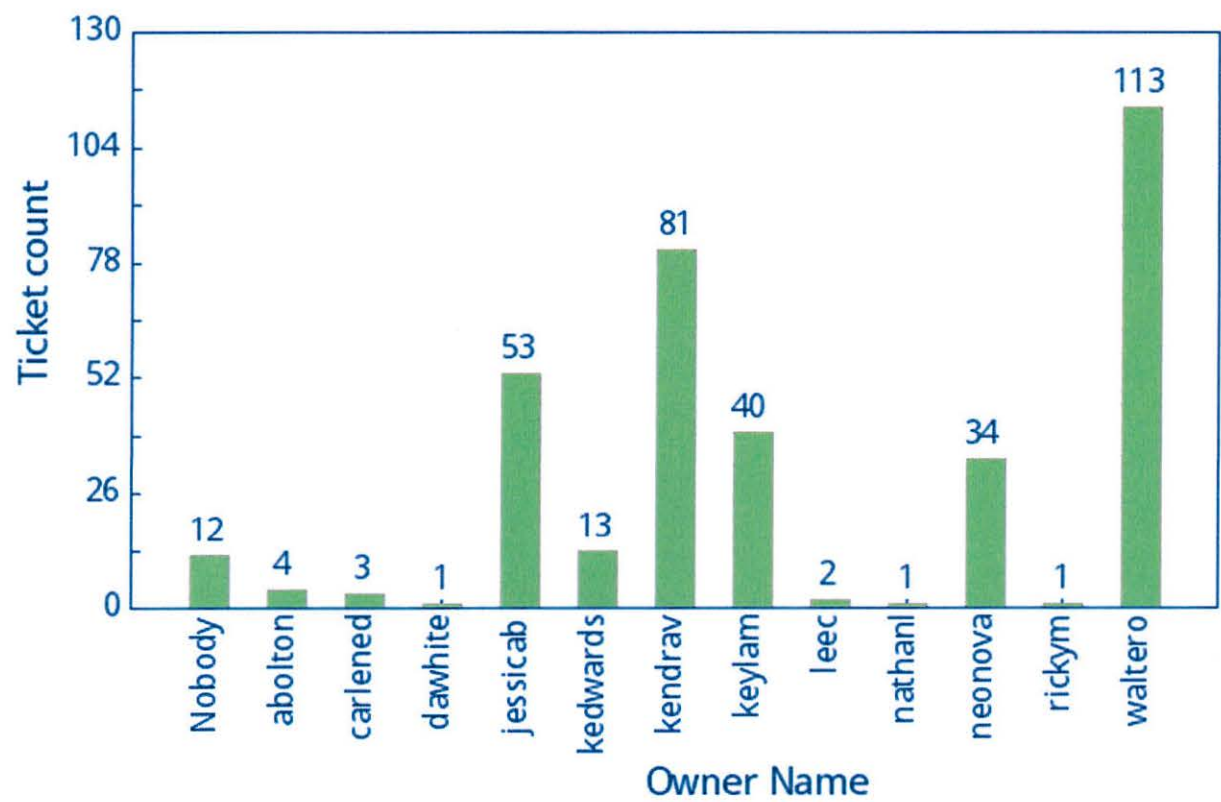
**Service Delivery & Network Operations:**

- New Ketchikan Dray heating install
- 118 Front Street MDU installation started

**Customer Support:**

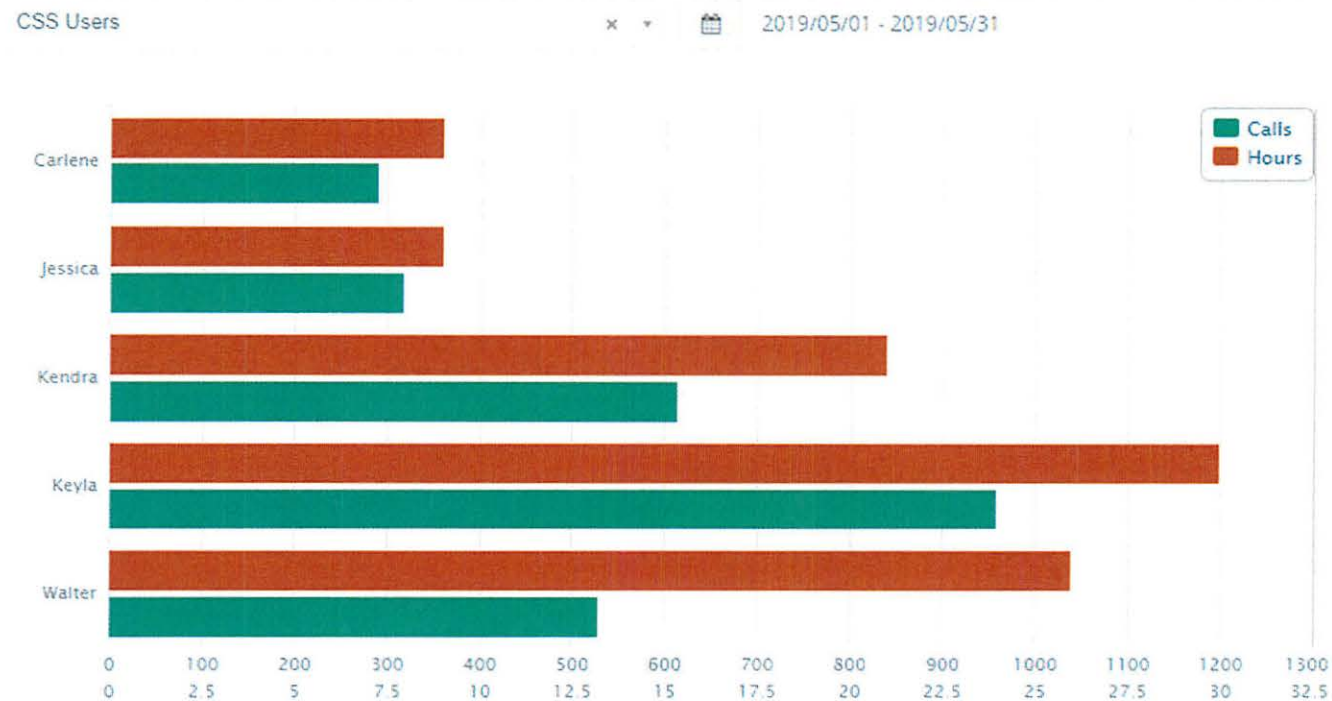
- Total Calls to Support Line 225-2111 = 437
- Calls forwarded to NeoNova 984-244-5721 = 195
- Calls Answered by Customer Support = 242

CSS Overview:



Owner Name	Ticket count
Nobody	12
abolton	4
carlened	3
dawwhite	1
jessicab	53
kedwards	13
kendrav	81
keylam	40
leec	2
nathanl	1
neonova	34
rickym	1
waltero	113
Total	358

## Total CSS Calls:



USER	RECORDED CALLS	DURATION (HOURS)
Carlene	290	9
Jessica	318	9
Kendra	614	21
Keyla	958	30
Walter	529	26

**MANAGER'S REPORT**  
**WATER DIVISION**  
**May 2019**

**FILTRATION AVOIDANCE**

When the EPA's Stage 2 Disinfection Byproducts Rule (Stage 2 DBP Rule) went into effect in October 2013, the required DBP sample points changed. The week and month that the samples must be collected is now specified and KPU can no longer average the results over the entire distribution system. Instead each sample point must stand on its own merits and when averaged over the mandatory February, May, August, & November samples, these become the official results that are measured for compliance and must unequivocally be below a 60 parts per billion (ppb) average for haloacetic acids (HAA5) and 80 ppb for total trihalomethanes (TTHM). Under the Stage 2 DBP Rule, compliance is based on the locational running annual average (LRAA) of the previous four quarterly samples from each site, not on the result of an individual sample.

After Two-Point Chlorination began on June 14, 2016, the February's sample results have consistently remained in the 40 ppb range. Although there are still unidentified causes for the seasonal year-to-year variance found in the nine quarterly samples collected thus far, but even with these inconsistencies, it is beginning to demonstrate more often than not (8 data points out of 9) that reducing the amount of chlorine at the Chlorination Plant, adding just enough chlorine at the Two-Point Facility and then finally adding ammonium hydroxide to form monochloramines is successful. By the time disinfected water leaves the Bear Valley Reservoir and enters the distribution system, the monochloramine reaction has almost completely quenched further formation of haloacetic acids.

Including the just received May 2019 results, the LRAA for haloacetic acids at Site 5 is 45.7 ppb and for Site 8, 41.4 ppb. Both of these sites are continuing to average below the EPA's 60 ppb maximum contaminant level (MCL) for haloacetic acids and **for the first time ever, Ketchikan will have remained in compliance with the Stage 2 DBP Rule for both haloacetic acids and total trihalomethanes for ten consecutive quarters.**

When the August 2019 HAA5 samples are collected, although the analytical results will be likely increased into the 60 ppb range due to warmer weather, Ketchikan will still remain in Stage 2 DBP Rule compliance on our 4-Quarter (LRAA) Running Average.

**OPERATIONAL ISSUES**

Throughout the Southeast Alaska Panhandle, the low lake levels coupled with low precipitation amounts that were received during the first two quarters of 2019 have reduced the ability of the large Tyee and Swan Lake hydrogeneration facilities to supply the individual community's electric power needs through their interconnected grid. Instead, it has required Ketchikan to continue running standby diesel generators to supplement our individual hydrogeneration facilities. Although the warming summer temperatures are melting the snow pack at the higher

elevations of Ketchikan's watersheds and augmenting the individual lake levels, it is a finite resource and in Ketchikan's case, is likely to be exhausted by July.

In Ketchikan's situation, the watershed that encompasses both the Upper and Lower Ketchikan Lakes including all of the surrounding drainage from the Granite Basin watershed is the sole source for all of Ketchikan's municipal drinking water as well as the supply for the Ketchikan Hydrogeneration Power Plant. Water is transferred into Fawn Lake through a series of tunnels and penstocks from these sources and from there, a second series of tunnels delivers raw water for operation of the Ketchikan Power Plant's hydroelectric generators as well as supplies water to the adjacent Primary Chlorination Plant to begin the disinfection process.

Because domestic water and water for electric power generation originate from the same source, the two uses could conceivably conflict during a water shortage as appears to be developing. 2018 was an abnormally dry year for Ketchikan with a total of only 106.59 inches of rain falling and the same weather patterns appear to be continuing into 2019.

Thus far, Ketchikan has received 12.7% less rainfall in 2019 when compared to 2018 for the same period. Only 47.51 inches of rain have fallen this year from January through May 30<sup>th</sup>. Similarly, for the same period in 2018 between January and May 30<sup>th</sup>, 54.44 inches fell. Overall, the National Weather Service office in Juneau expects this pattern to continue well into 2019 with precipitation predicted to be well below normal (perhaps as much as 40%) in June. Above normal temperatures are also predicted for June, July, and August although the probability of more or less precipitation than normal for those months is less defined and is simply called an "equal chance".

Although the Granite Basin watershed provides a significant quantity of water to augment the amount supplied from Ketchikan Lakes, it is not without operational problems. In 2017, KPU completed the requirements of a Compliance Order by Consent (COBC) with the ADEC and received their Approval to Operate. The COBC required KPU to complete watershed studies, evaluate management alternatives including intermittent isolation of Granite Basin, and address the elevated coliform bacteria and elevated turbidity levels present in the raw water. The studies found that after a prolonged dry spell followed by a heavy rainfall storm, particularly from the Granite Basin portion of the watershed, there was an initial flush of organic material including coliform colonies being washed from the surrounding hillsides into Fawn Lake.

This presents Ketchikan with a very difficult decision with severe consequences during periods limited rainfall creating reduced Ketchikan Lake levels such as we have now. For the past two and a half years, KPU has continued to comply with all ADEC regulations regarding disinfection byproducts requirements, elevated raw water coliform levels, and turbidity excursions in the raw water supply under the terms of the COBC. However, this has also required the diversion of the Granite Basin watershed into Ketchikan Creek rather than Fawn Lake before the arrival of major storms. With the drier than usual weather patterns that are continuing in 2019, the amount of water stored in Ketchikan Lakes and available for use as hydropower generation is gradually being reduced. KPU's other sources of hydropower are also becoming exhausted and continuous diesel generation is required to make up the difference.

Simply not diverting Granite Basin before a major storm occurs will have the possible effect of putting Ketchikan's filtration avoidance program at risk. Given the potential of having more dissolved organic compounds present in the Utility's raw water supply during the summer months that will form haloacetic acids after chlorination disinfection; the probability of further raw water supply turbidity "events" being caused by landslides or major storms; and the presence of greater numbers of raw water fecal coliform colonies during the warmer summer months; KPU may find itself in the unfortunate position of soon having to negotiate another COBC Order with ADEC for the construction of expensive filtration facilities according to specific timelines.

### **Contract 19-06, Water Meters – Business & Commercial Customers**

At their meeting of February 21<sup>st</sup>, the City Council approved Resolution No. 19-2726 approving Loans Nos. 481201 and 481191 offered to the City through ADEC's Clean and Drinking Water Loan Programs for a total of \$2.6 million. The cost of the Commercial Metering Project will be shared equally between the water and wastewater utilities with each utility's share to be \$1.3 million.

With loan financing now in place, KPU is preparing to advertise an initial contract for the meter installation work. This first contract will be limited in size to allow everyone involved to both gain experience and to obtain better knowledge of the difficulties that are encountered while installing individual meters. 70 businesses have already been audited by staff and in each instance, the audit has determined the service size, meter location, the telephone number and contact person, and identified any additional complications that the contractor may have to address while installing the new meter.

Section 3.2 of Clean Water Loan No. 481201 Agreement requires a Cost and Effectiveness Certification document to certify that Ketchikan has conducted studies and evaluations for determining the effectiveness of this project. This has been completed and delivered to ADEC. In addition, Sections 3.2 in both the Clean and Drinking Water Loan Agreements require ADEC approval before beginning with final design or construction.

Accordingly, a draft of Contract 19-06 has been submitted to ADEC's Division of Water, Technical Assistance and Financing Program for their review and comment. Their initial comments were quickly returned and are now incorporated into our Bid Documents. ADEC has approved the revisions and the Bid Documents are now complete and will be advertised beginning on June 8<sup>th</sup>, 12<sup>th</sup>, & 15<sup>th</sup>. A Pre-bid meeting will be conducted on June 25<sup>th</sup>, bids will be received and opened on July 2<sup>nd</sup>, and followed with a recommendation made to the City Council for award of the contract at their meeting of July 18<sup>th</sup>. The initial contract duration will be for 140 days which should see completion by mid-December.

After a water meter has been installed by the contractor, an Eaton Cooper Power water node will be installed and activated by KPU employees at this individual water meter to monitor the water flow consumption. These water nodes have the ability to communicate directly with their counterpart "smart" Eaton Cooper Power electric meters who then convey the water

consumption information to KPU Electric and the City's Finance Department for monthly utility billing purposes.

Although this first contract is limited in size, as this contractor's work progresses, there will be sufficient information to begin the preparatory work for the next contract. There are another 350-370 businesses that still need to be audited to determine the service size, meter location, the telephone number, and contact person. In addition, any additional complications that the contractor may encounter while installing this new meter also have to be identified. In order to achieve the goal of having all of Ketchikan's business and commercial buildings fully metered as well as all residential apartment complexes sized 4-plex and larger completed before the end of 2020 will require additional assistance provided by a qualified professional engineering firm.

The amount of staff time that KPU's employees can devote to a contract of this magnitude is limited as they have many other operating responsibilities which have to be met daily, including the most critical one which is meeting the stringent EPA's Administrative Order (AO) requirements. For over 25 years since July, 1993, this AO, has allowed Ketchikan to continue as one of the very few unfiltered water systems remaining anywhere within the United States.

As a measure of the critical importance of Ketchikan continuing to meet the requirements of the AO; should the EPA's criteria not be met at some later date, all three of the conceptual Ketchikan filtration alternatives that were presented to Council last fall had an estimated capital cost of at least \$70-million with an annual O & M cost of \$2-million or more.

TABLE I

**HALOACETIC ACID & TOTAL TRIHALOMETHANE ANALYSIS  
STAGE 2 DISINFECTION & DISINFECTION BYPRODUCTS RULE**

DATE	No. 2 Fire Station 3352 Tongass Ave. (Site 8 - High TTHM)		Buren & Bailey Boulevard (Site 5 - High HAA5)		Bear Valley Reservoir  Special Purpose Samples		
	HAA5 formation, ppb	TTHM formation, ppb	HAA5 formation, ppb	TTHM formation, ppb	HAA5 formation, ppb	TTHM formation, ppb	
8 April 2014	Chloramination Disinfection Begins						
14 June 2016							Two-Point Chlorination Begins
8 Aug. 2018	39	44.7	52.0	48.7	48.2	48.8	<u>Third Quarter Sample</u>
6 Nov. 2018	53.2	29.0	47	25.0	47	20.9	<u>Fourth Quarter Sample</u>
4 Feb. 2019	39.5	27.0	44.8	26.0	34.0	20.9	<u>First Quarter Sample</u>
6 May 2019	33.7	28.1	39.1	28.1	33.0	25.2	<u>Second Quarter Sample</u>
Four Quarter Running Annual Average at Individual Sites	41.4	32.2	45.7	32.0	40.6	29.0	